

# **CREATING CHATBOT FOR ESTHETE FAB HOMES**

**Submitted By**

**VINITHA . A**

**(21PCC014)**

**Under the Guidance of**

**Dr.A.R. RIHANA BANU, M.COM (CA)., PH.D., SET**

Department of Commerce,

Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore.

**In partial fulfilment of the requirements for the award of the Degree of**

**Master of Commerce with Computer Applications**



**2022 - 2023**

**DEPARTMENT OF COMMERCE**

**AVINASHILINGAM INSTITUTE FOR HOME SCIENCE**

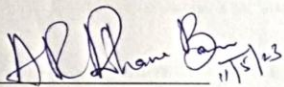
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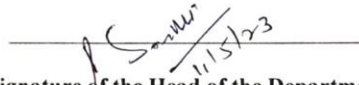
# **CERTIFICATE**

## CERTIFICATE

This is to certify that the project work entitled "CREATING CHATBOT FOR ESTHETE FAB HOMES" submitted to Department of Commerce, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, in partial fulfilment of the requirements for the award of the Degree of Master of Commerce with Computer Applications, is the record of the original project work done by A. VINITHA (21PCC014) during the period of her study, under my supervision and guidance

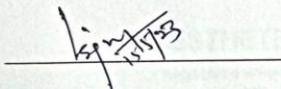
  
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Signature of the Supervisor


  
11/5/23

Signature of the Head of the Department

Submitted for the viva voice examination held on 15.05.2023

  
15/5/23

Internal Examiner

  
15/5/23

External Examiner



Ref.No.EDB009/004/2023-24  
Date : 26<sup>th</sup> April 2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. VINITHA. A (Reg No: 21PCC014)**, a final year student of **M.COM(CA) in AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN**, Coimbatore has successfully completed her project work entitled **“CREATING CHATBOT FOR ESTHETE FAB HOMES”** in our organization during the period from December 2022 to April 2023.

We found her performance and character to be good during the said period.

We wish all success in her future endeavors.

for ESTHETE DESIGNERS & BUILDERS PVT.LTD.,

  
JAYALAKSHMI  
HR DEPARTMENT



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# **DECLARATION**

## DECLARATION

I hereby declare that this project work entitled “**CREATING CHATBOT FOR ESTHETE FAB HOMES**” submitted to Department of Commerce, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, in partial fulfilment of the requirements for the award of the **DEGREE OF MASTER OF COMMERCE WITH COMPUTER APPLICATIONS** is the record of the original project work done by **A.VINITHA (21PCC014)** during the period of study, under the supervision and guidance of **Dr. A.R. RIHANA BANU, M.COM(CA),SET.,Ph.D.**, Assitant Professor Department of Commerce, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore.

Place: Coimbatore

Signature of the Candidate

Date : 15.05.2023





# ACKNOWLEDGEMENT

## ACKNOWLEDGEMENT

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# CONTENT

## CONTENT

<b>S.NO</b>	<b>CHAPTER</b>	<b>PAGE.NO</b>
<b>I</b>	<b>INTRODUCTION</b> Chatbot and Machine Learning About the Company	1 5
<b>II</b>	<b>REQUIREMENT ELICITATION</b> Requirement Elicitation Existing System Proposed System	9 10 10
<b>III</b>	<b>SYSTEM REQUIREMENT SPECIFICATION</b> Hardware Specification Software Specification Software Prototyping Prototyping Model	15 16 16 17
<b>IV</b>	<b>SYSTEM DESIGN AND DEVELOPMENT</b> System Design System Flow Design Input Design	42 42 43 44

	Output Design Data Flow Diagram Code Design Form Design	46 50 102
<b>V</b>	<b>SYSTEM TESTING</b> Integrated Testing Acceptance Testing	106 107
<b>VI</b>	<b>SYSTEM IMPLEMENTATION AND MAINTENANCE</b> Implementation Procedure System Maintenance	109 110
<b>VII</b>	<b>CONCLUSION</b> Conclusion Scope For Future Enhancement	111 112
	<b>BIBLIOGRAPHY</b>	



# ABSTRACT

## ABSTRACT

As a result of the rapid technological development and the development of the chatbot concept and the time and effort it can save. Most of the companies have emerged to undertake chatbot creation and development. By relying on artificial intelligence, the chatbot has integrated machine learning within it, and it has become more comprehensive and wider for various technological fields. Therefore, a chatbot has been created for the **ESTHETE FAB HOMES**, the project aims to build a chatbot to facilitate the process of accessing information related to clients' inquiries towards construction, building products itself and their constructing method.

The front end of this project was created using HTML, CSS and the back end using PYTHON, FLASK. It uses security provider software, which we can access from anywhere, to provide superior security facilities.

To enhance the user experience, chatbot interfaces can be designed with user-friendly features, such as natural language understanding, multi-turn conversations, and personalized recommendations. Integration with external systems and APIs allows the chatbot to access real-time data, enabling it to provide up-to-date and accurate information.

The design and architecture of the chatbot system are established. This includes selecting the appropriate NLP techniques, such as intent recognition, entity

extraction, and sentiment analysis, to understand and interpret user inputs accurately. Choosing an appropriate dialogue management approach, such as rule-based systems, retrieval-based models, or generative models, influences how the chatbot responds to user queries.

## **CHAPTER I**

### **INTRODUCTION**

- This “web-based interactive chatbot” project can simulate conversations with the clients and marketing team. The clients can ask/query anything with this web application and the chatbot will automatically respond accordingly to the queries/questions.
- Chatbot applications are increasingly adopted in various domains such as customer and company staff and also e-commerce or customer services as a direct communication channel between companies and end-users.
- Multiple frameworks have been created to facilitate their definition and development. While these frameworks are efficient to design simple chatbot applications, they still require advanced technical knowledge to define complex interactions and are difficult to evolve along with the company’s needs.
- The staff panel has many features that are related to the chat bot information. The staff can also manage some other details of the chatbot such as the welcome message, no result message for the query.
- Talking about the chatbot responses, the staff will store information in the system and will tag the possible question for that response. The system also stores the questions that no answers can be found in the database.
- Moreover, the development of a chatbot application typically requires a deep understanding of the designated stages, particularly back-end connections, expanding the turn of events and upkeep costs.

## **Chatbot and Machine learning**

Machine learning chatbots works using artificial intelligence. User need not to be more specific while talking with a bot because it can understand the natural language, not only commands.

This kind of bots get continuously better or smarter as it learns from past conversations it had with people.

## **Artificial Intelligence**

AI was coined by John McCarthy, an American computer scientist, in 1956 at The Dartmouth Conference where the discipline was born. Today, it is an umbrella term that encompasses everything from robotic process automation to actual robotics. It has gained prominence recently due, in part, to big data, or the increase in speed, size and variety of data businesses are now collecting. AI can perform tasks such as identifying patterns in the data more efficiently than humans, enabling businesses to gain more insight out of their data.

## **Types of artificial intelligence**

### **Type 1: Reactive machines.**

The IBM chess program that beat Garry Kasparov in the 1990s. Deep Blue can identify pieces on the chess board and make predictions, but it has no memory and cannot use past experiences to inform future ones. It analyzes possible moves -- its own and its opponent -- and chooses the most strategic move. Deep Blue and Google's AlphaGO were designed for narrow purposes and cannot easily be applied to another situation.

### **Type 2: Limited memory.**

These AI systems can use past experiences to inform future decisions. Some of the decision-making functions in autonomous vehicles have been designed this way. Observations used to inform actions happening in the not-so-distant future, such as a car that has changed lanes. These observations are not stored permanently.

### **Type 3: Theory of mind.**

This is a psychology term. It refers to the understanding that others have their own beliefs, desires and intentions that impact the decisions they make. This kind of AI does not yet exist.

#### **Type 4: Self-awareness. In this category,**

AI systems have a sense of self, have consciousness. Machines with self-awareness understand their current state and can use the information to infer what others are feeling. This type of AI does not yet exist.

### **Natural Language Processing**

Natural Language Processing (NLP) is the study of letting computers understand human languages. Without NLP, human language sentences are just a series of meaningless symbols to computers. Computers don't recognize the words and don't understand the grammars. NLP can be regarded as a "translator", who will translate human languages to computer understandable information. Traditionally, users need to follow well-defined procedures accurately, in order to interact with computers. For example, in Linux systems, all commands must be precise. A single replace of one character or even a space can have significant difference. However, the emergence of NLP is changing the way of interacting. Apple Siri and Microsoft Cortana have made it possible to give command in everyday languages and is changing the way of interacting.

### **Machine Learning**

Machine Learning (ML) is an area of computer science that "gives computers the ability to learn without being explicitly programmed". The parameter of the formulas is calculated from the data, rather than defined by the programmer. Two most common usage of ML is Classification and Regression. As Classification means to categorize different types of data, while Regression means to find a way to describe the data. Basic ML program will have two stages, fitting and predicting. In the fitting stage, the program will be given a large set (at least thousands) of data. The program will try to adjust its parameter based on some statistical models, in order to make it "fit" the input data best. In the predicting stage, the program will give a prediction for a new input based on the parameters it just calculated out. The famous Iris flower dataset contains the measurement of several features of three different species of flowers, such as the length of sepals and petals.

## **Chatbot**

A chatbot is a computer program that can simulate a conversation or chat with a user in natural language through messaging applications, website, or mobile applications and interact with users according to their input and should be available 24/7. Chatbots are developed and became so popular due to the increased use of smart devices and IoT technology.

### **Types of chatbots**

a. Base-line chatbot:

It is a chatbot that is based on a database and uses if / then logic to create a conversation flow and that takes a lot of time to ensure the understanding of the question and the answer needed.

b. AI chatbot:

This type of chatbot is more complex than base-line but it is more interactive and personalized and needs big data training to be impressive if the problem is matched to their capabilities.

c. Hybrid Model:

A hybrid approach mixes the Base-line & AI chatbot to make it smart and his behavior more expected by depending on database and Ai algorithm to work together.

### **How do chatbots work?**

Briefly and as mentioned in the definition, humans interact with chatbots. There are two ways to interact with a chatbot:

a. Text

chatbot analyzes the inputted text and matches the text with predefined data called intents which are categorized to manage the conversation. The user utterance is tagged with one of these intents, even if what the user says stretches over two or more intents. Most chatbots will take the intent with the highest score and take the conversation down that avenue.

b. Voice

Some chatbots can interact and understand the voice of the user using a set of application programming interfaces (api's) that converts the recorded voice to the

language and then convert the voice to words of that language and then deal with the transformed text as mentioned above.

## **ABOUT THE COMPANY**



Preset Building Systems Private Limited is an unlisted private company. It is classified as a private limited company and is located in Bangalore, Karnataka.

SANJEEV ANUDEV is the CEO of the company.

Preset Building Systems Private Limited has two directors - HAMSAVARDHAN and SHIFALI HAMSAVARDHAN.

The Corporate Identification Number (CIN) of Preset Building Systems Private Limited is U45309KA2022PTC156424.

The registered office of Preset Building Systems Private Limited is at Esthete No 361, 7th Main Road, HAL 2nd Stage, Indiranagar, Bengaluru, Bangalore, Karnataka.

Its authorized share capital is Rs. 500,000 and its paid up capital is Rs. 20,000.

In the company there are 7 Architects, 2 Civil Engineers, 1 Software Developer, 1 Marketing, 1 HR, 1 Material Co-Ordinator, 1 Admin Head, 1 Accounts,



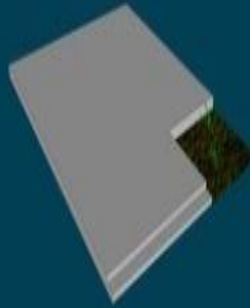
## **THEIR BUILDING PROCESS :**

Proprietary system has the highest proportion of prefabricated elements compared to any other construction technology available.

**1** EASY DESIGN TOOL



**2** CHOICE OF FOUNDATION  
PERMANENT/ NON PERMANENT



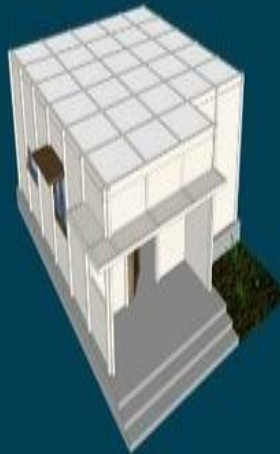
**3** PRE-ENGINEERED STRUCTURAL  
ELEMENTS ERECTED



**4** PRE FINISHED WALLS &  
ROOF PANELS FIXED



**5** OTHER FINISHES INSTALLED



**6** FINISHED PROJECT HANDOVER



**PRESET™**  
BUILDING SYSTEMS

# THE NEW ERA OF HOMES

IT'S NOT A DIFFERENT TYPE OF HOUSE, JUST A DIFFERENT WAY OF PUTTING A HOUSE TOGETHER!

- ✓ Precision built homes
- ✓ Personalized by you
- ✓ Factory-controlled construction
- ✓ Greener, Faster Smarter!
- ✓ Greater Durability
- ✓ Greater Energy Efficiency

## **BENEFITS OF INNOVATIVE METHODOLOGIES.**

An INTEGRATED SYSTEM that combines DESIGNING & CONSTRUCTION. PRESET system uses proprietary prefabricated, pre-engineered & pre-finished components to build, & their DIGITAL twins to plan & design any type of buildings!

- Easy design process
- Fastest construction speeds achieved
- Least impact on nature
- Long life & Disaster proof
- Predictable & on time delivery
- Guaranteed Quality
- Reliable & fixed budget
- 100% Relocatable
- Expandable vertically & Horizontally
- Little to no water is needed for the process

## **OBJECTIVES**

- Chatbots are designed to give people an automated way to communicate with company.
- Save effort and time for both the clients and staff members of the company who wish to enroll.
- Provide detailed information about company and product.

## **SOME COMMON PURPOSES FOR CHATBOTS**

**Customer support:** Chatbots can assist customers by answering frequently asked questions, providing information about products or services, and troubleshooting common issues. They can offer 24/7 support and help improve response times.

**Lead generation and sales:** Chatbots can engage with website visitors, qualify leads, and provide personalized recommendations or offers. They can assist in guiding users through the sales process and capturing contact information for follow-up.

**Information retrieval:** Chatbots can act as virtual assistants, retrieving information from databases, websites, or other sources. They can help users find specific information, such as news updates, weather forecasts, or product details.

**Task automation:** Chatbots can automate repetitive tasks, such as scheduling appointments, making reservations, or processing orders. They can save time and streamline processes for both businesses and individuals.

## **CHAPTER II**

# **REQUIREMENT ELICITATION**

## **REQUIREMENT ELICITATION**

Requirement elicitation is concerned with learning and understanding the needs of users and project sponsors with the ultimate aim of communicating these needs to the system developers. It is the practice of researching and discovering the requirements of a system from users, it involves studying a procedure or business in order to identify its goals and purposes and create system and procedures that will achieve them in an efficient way. Use cases are a widely used system modelling tool for identifying and expressing the functional requirements of a system. It studied the problem, identify the alternate solution, evaluating the problem and finally give the best solution.

Requirements elicitation is the collection of the requirements of any given system or product from users, customers and other important stakeholders. While you will be using the information from customers, you can find that an elicitation process is far more dedicated and widespread than usual information gathering. It uses a wealth of different forms of study to gain information from interviews and questionnaires handed out en masse to observation, long-term study, workshops, professional brainstorming, role playing and even prototyping. This huge wealth of different features means that elicitation can provide a business with a far wider spectrum of information to learn from. It gives you a much greater wealth of data, opinion and feedback levels to build from – and with this information, getting a far more developed and integrated business becomes much easier than before.

## **REQUIREMENT ELICITATION ANALYSIS PROCESS**

It's a process of interacting with customers and end-users to find out about the domain requirements, what services the system should provide, and the other constrains. It is the practice of researching and discovering the requirements of a system from users, customers, and other stakeholders. The practice is also sometimes referred to as "requirement gathering".

## **EXISTING SYSTEM**

Nowadays, computers play a major role. In the current system, operations are carried out in a conventional manner and physical form. The work takes longer to accomplish in this traditional way. The customer can't know the basic details of the dream house. Inconvenient in the both customer and company side.

### **Drawbacks of Existing System**

- Time consumption
- High manpower required
- Poor accessibility
- Poor customer relationship
- Technological issues
- Promotional strategies been copied

### **PROPOSED SYSTEM**

The proposed system is developed in such a way to solve the above problems faced by the present normal system by using latest technology. The drawbacks, which are faced during existing system, can be eradicated by using the proposed system. The main objective of the existing system is to provide a user-friendly interface. Security can also be provided as per the requirements of the users. The system uses less time to produce reports.

With the computerization of the concern, the errors can be rectified. The new system will replace the existing manual processing to overcome the drawbacks.

The proposed system uses PYTHON as the back end, which has powerful functions, easy accessing methods, and is user-friendly. Enough security is provided to the new system. This system helps to access all information regarding basic plan details, product details, and working place details so that we can know the necessary information. So that it saves time, helps to make the decision quickly, and reduces errors, there are no chances of getting data mishandled . Mainly can view reports in a shorter amount of time.

### **Advantages of Proposed System**

- Time saving
- Better customer experience
- Build trust and brand loyalty
- Increase website traffic with direct links to the chatbot from anywhere
- Impress the customer
- Engage with wide range of audience

## **DEVELOPMENT OF A PROTOTYPE**

Prototyping is an important part of any digital design process. It allows you to emulate interface designs, explore different user experiences, and test outflows of the projects. With a prototype development, you know exactly how the product is going to look and behave on the particular device if the project scope is well defined. It starts with the client coming up with a new idea to bring it to life. The development team and client brainstorm to list down all the possible elements, features, design, flow, costing, and more that are crucial for the project. Prototypes are created to give an exact idea as to how the project would look if given life to it.

With necessary feedback and changes, what then comes out of it is the final project scope definition. For a smooth flow that can be executed to address the project requirements, the project managers create a prototype for each stage that will eventually lead to the final product. As a working model of project, prototyping allows limited functionality and users can evaluate the proposed plans for its feasibility. As a basic characteristic, prototyping helps you understand the requirements of the project and eliminate barriers by reviewing and sharing feedback on the flow and design of the project.

## **FEASIBILITY STUDY**

A system is a feasible system only if it is feasible within limited resource and time. In this system each and every process is feasible for the user and the developer. It proved user friendly input such as device independent inputs and getting proper solution for the problem. The objective of the feasibility study is to establish the reasons for developing a software that is acceptable to users, adaptable to change, and comfortable to standards. Feasibility is a practical extent to which a project can be performed successfully. To evaluate feasibility, a feasibility study is performed, which determines whether the solution considered to accomplish the

requirements is practical and workable in the software or not. Such information as resource availability, cost estimate for software development, benefits of the software to organization, and cost to be incurred on its maintenance are considered.

## **TYPES OF FEASIBILITY**

1. Technical feasibility
2. Operational feasibility
3. Economic feasibility.

### **Technical Feasibility**

Technical Feasibility is the assessment of the technical view of the system. The system is developed for Dot net environment- a platform independent tool is used to develop the system. The consideration that are normally associated with the technical feasibility include the following

- Development risk
- Resource availability
- Technology

A technical feasibility study can provide relevant context to the different aspects of your project and serve as a great planning tool by providing an overhead view of how your project can evolve during the course of its development, troubleshooting and tracking the progress of your project from concept to reality. Technical Feasibility assesses the current resources and technology, which are required to accomplish user requirement in the software within the allocated time and For this, the software development team ascertains whether the current resources and technology can be upgraded or added in the software to accomplish specified user requirements. It ascertains that the technology chosen for software development has large number of user so that they can be consulted when problems arise, or when improvements are

required. It analyses the technical and capabilities of the software development team members. It determines whether the relevant technology is stable and established.

### **Operational Feasibility**

Operational feasibility assesses the extent to which the required software performs a series of steps to solve business problems and user requirements. Operational Feasibility deals with the study of prospects of the system. This system operationally eliminates all the tensions of the administrator and helps in effectively tracking the project progress. Operational feasibility is dependent on human resources available for the project and involves projecting whether the system will be used if it is developed and implemented.

Operational feasibility is mainly concerned with issues like whether the system will be used if it is developed and implemented. Operational feasibility is a measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis. Operational feasibility reviews the willingness of the organization to support the proposed system.

### **Economic Feasibility**

Economic feasibility determines whether the required software is capable of generating financial gains for an organization. It involves the cost incurred on the software development team, estimated cost of hardware and software, cost of performing feasibility study, and so on. For this, it is essential to consider expenses made on purchases and activities required to carry out software development.

In economic feasibility, the most important is cost-benefit analysis. As the name suggests, it is an analysis of the costs to be incurred in the system and benefits derivable out of the system. In addition it is necessary to consider the benefits that can be achieved by developing the software. Cost of hardware, software, development team and training.

## **FEASIBILITY STUDY PROCESS**

### **INFORMATION ASSESSMENT**

The feasibility assessment is typically conducted at a point in the project where alternative solutions are being compared prior to selecting a single go-forward solution or approach. If there is only one potential solution or approach being considered, it is still beneficial to conduct a feasibility assessment in order to verify the viability of that solution before investing fully. Identifies information about whether the system helps in achieving the objectives of the organization. It also verifies that the system can be implemented using new technology and within the budget, and whether the system can be integrated with the existing system.

### **INFORMATION COLLECTION**

Specifies the sources from where information about software can be obtained. Generally, these sources include users, and the software development team. Information collection brings objectivity in decision making. Data will also help you to do Cost Benefit analysis and look for yourself. If solution is costing more than the problem. A good data collection simplifies your problem solving ability and when combined with statistics it gives you the firepower to move faster in your project.

### **REPORT WRITING**

Uses a feasibility report, which is the conclusion of the feasibility by the software development team. It includes the recommendation whether the software development should continue or not. A feasibility report is a testimony that attempts to create some sort of action. A feasibility report also determines whether or not the investigated task can be done with the amount of resources available OR how many resources will be necessary in order to complete the task.

## **CHAPTER III**

### **SYSTEM REQUIREMENT SPECIFICATION**

## **SYSTEM REQUIREMENT SPECIFICATION**

A System Requirements Specification (SRS) (also known as a Software Requirements Specification) The System Requirements Specification (SRS) document describes all data, functional and behavioural requirements of the software under production or development. Every software has specific goals and serves particular purposes. Each goal and purpose translates a process or several processes that the software aims to solve or to automate. To deliver the right product, we should define it well from the beginning. System requirements specification or SRS frameworks development, it documents every operation and dictates how software should behave, it can be as detailed as what a button should do and should be as complete and correct as possible. The purpose of a system requirements document is to describe the behaviour as well as the different functionalities of an application or software in a specific environment.

System Requirements Specification is a document or set of documentation that describes the features and behaviour of a system or software application. It is the official statement of what the system developers should implement. And it is a complete description of the behaviour of the system to be developed. It includes both a definition of user requirements and a specification of the system requirements. The system requirement specification fully describes what the software will do and how it will be expected to perform.

## **HARDWARE SPECIFICATION**

The hardware must suit the application and development. It stores all the information and data permanently. So hardware must be reliable and cost effective. It is the fast enough to complete and it works effectively and efficiently. Computer hardware specifications are technical descriptions of the computer's components and capabilities. Processor speed, model and manufacturer. Processor speed is typically indicated in gigahertz (GHz). The higher the number, the faster the computer. Random Access Memory (RAM), this is typically indicated in gigabytes (GB). The more RAM in a computer the more it can do simultaneously. Hard disk (sometimes called ROM) space. This is typically indicated in gigabytes (GB) and refers generally to the amount of information (like documents, music and other data) your computer can hold

## **HARDWARE SPECIFICATION**

Device name : DESK TOPS, MOBILE, PC, TABLET

Processor :11<sup>th</sup> Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz 2.42 GHz

RAM : 8.00 GB (7.80 GB usable)

System type : 64-bit operating system, x64-based processor

## **SOFTWARE SPECIFICATION**

Operating system: Windows 11

Front End : HTML,CSS,JQUERY,AJAX

Back End : PYTHON, FLASK

## **SOFTWARE PROTOTYPE**

Software prototyping is the activity of creating prototypes of software applications, making complete versions of the software program being developed. It is an activity that can occur in software development and is comparable to prototyping as known from other fields .The Software Prototyping refers to building software application prototypes which displays the functionality of the product under development, but may not actually hold the exact logic of the original software. Software prototyping is becoming very popular as a software development model, as it enables to understand customer requirements at an early stage of development. It helps get valuable feedback from the customer and helps software designers and developers understand about what exactly is expected from the product under development.

## **PROTOTYPING MODEL**

The Prototyping Model is one of the most popularly used Software Development Life Cycle Models (SDLC models).This model is used when the customers do not know the exact project requirements beforehand. In this model, a prototype of the end product is first developed, tested and refined as per customer feedback repeatedly till a final acceptable prototype is achieved which forms the basis for developing the final product. In this process model, the system is partially implemented before or during the analysis phase thereby giving the customers an opportunity to see the product early in the life cycle. The process starts by interviewing the customers and developing the

incomplete high-level paper model. This document is used to build the initial prototype supporting only the basic functionality as desired by the customer. Once the customer figures out the problems, the prototype is further refined to eliminate them. The process continues until the user approves the prototype and finds the working model to be satisfactory.

## **INCREMENTAL PROTOTYPING**

Incremental model the whole requirement is divided into various builds. Multiple development cycles take place here, making the life cycle a “multi-waterfall” cycle. Cycles are divided up into smaller, more easily managed modules. Incremental model is a type of software development model like V-model, Agile model etc . In this model, each module passes through the requirements, design, implementation and testing phases. A working version of software is produced during the first module, so you have working software early on during the software life cycle. Each subsequent release of the module adds function to the previous release. The process continues till the complete system is achieved.

In incremental Prototyping, the final expected product is broken into different small pieces of prototypes and being developed individually. In the end, when all individual pieces are properly developed, then the different prototypes are collectively merged into a single final product in their predefined order. It’s a very efficient approach which reduces the complexity of the development process, where the goal is divided into sub-parts and each sub-part is developed individually. The time interval between the projects begin and final delivery is substantially reduced because all parts of the system are prototyped and tested simultaneously. Of course, there might be the possibility that the pieces just not fit together due to some lack in the development phase – this can only be fixed by careful and complete plotting of the entire system before prototyping starts.

## **WINDOWS 11 PRO**

Windows 11 Pro is the latest version of the Windows operating system developed by Microsoft. It was officially released on October 5, 2021, and it comes with various new features and improvements compared to its predecessor, Windows 10. One of the most noticeable changes is the

new user interface, which is more modern and streamlined. It also includes new features like snap layouts, snap groups, and virtual desktops, which make it easier to organize and manage multiple windows. In addition, Windows 11 Pro offers improved security features such as Windows Hello, which uses facial recognition to authenticate users, and Windows Defender, which provides better protection against malware and other online threats.

Other new features include improvements to the Start menu, redesigned Taskbar, and enhanced touch support for hybrid devices. Windows 11 Pro also comes with a new version of Microsoft Edge, which is faster and more secure than its predecessor. Overall, Windows 11 Pro is a significant update to the Windows operating system, offering improved performance, enhanced security features, and a more user-friendly interface.

## **FEATURES**

- **Modernized User Interface:** Windows 11 Pro features a new modernized user interface, which is more streamlined and user-friendly.
- **Start Menu and Taskbar:** The Start menu has been redesigned, and the Taskbar is now centred on the screen. It also includes a new feature called Snap Layouts, which makes it easier to arrange and organize open windows.
- **Improved Performance:** Windows 11 Pro is designed to be faster and more responsive than previous versions of Windows. It also includes better support for touch and pen input.
- **Enhanced Security:** Windows 11 Pro includes improved security features such as Windows Hello, which uses facial recognition to authenticate users, and Windows Defender, which provides better protection against malware and other online threats.
- **Microsoft Store:** The Microsoft Store in Windows 11 Pro has been redesigned and now includes a wider range of apps and games.
- **Virtual Desktops:** Windows 11 Pro includes support for virtual desktops, which allows users to create multiple desktops and switch between them.
- **Widgets:** Windows 11 Pro includes a new widget feature that allows users to view information like news, weather, and sports scores directly from the Taskbar.

## **ABOUT HTML**

Hyper Text Markup Language this language provides the format for specifying simple

logical structure and links in a hypertext document. As a markup language, special formatting commands are placed in the text describing how the final version should appear. These formatted documents are interpreted by a Webbrowser which uses the HTML code to format the page being displayed. Although most professionals use special authoring tools to write HTML documents and to manage sites, developers of e-commerce sites and applications need to know the nitty-gritty detail of HTML, and this is what you will study. HTML has had several versions over the years. "HTML 2.0" was the first standard HTML specification which was published in 1995. HTML 4.01 was a major version of HTML and it was published in late 1999. Though HTML 4.01 version is widely used but currently we are having HTML 5 version which is an extension to HTML 4.01, and this version was published in 2012 . This course will take you through website creation using HTML5.

The major points of HTML are given below:

- HTML stands for HyperText Markup Language.
- HTML is used to create web pages and web applications.
- HTML is widely used language on the web.
- We can create a static website by HTML only.
- Technically, HTML is a Markup language rather than a programming language.

### **HTML Markup**

HTML pages are created by tagging textual information with HTML markup. HTML markup consists of tags, which appear inside angled brackets < and > . An example of an HTML tag is **<b>**, which causes text to appear in bold. **<b>** notes where text should begin to appear in bold, while the tag marks the end of the emboldening. Most HTML tags have a corresponding end tag, which is specified by the name of the tag preceded by the / character.

### **Creating HTML Text using Notepad++**

This section covers the creation of an HTML page. You will need a Web browser and a text editor. Use HTML: Basics 3 any text editor you wish to, but the following Activity descriptions will use Notepad++. Notepad++ is a free Windows editor that also supports several programming languages. For example, you will notice that HTML keywords are highlighted in different colors.

1. Open your Web browser. This sections' goal is to create a Web document that can be opened with your browser.

2. Open Notepad++. It can be found by selecting Start, then All Programs, then Notepad++.

Type the following text into Notepad++: your name and the module number (CSC5003). Save this file as start.txt.

- Now load start.txt into the browser by dragging start.txt onto your browser.
- The browser should now display the text contained in start.txt. (If it does not, make sure that you have saved start.txt and that this is the file you are opening).
- Once you have displayed start.txt, return to Notepad. Add the text "Internet Commerce", and save the file again.
- Return to the Web browser and reload the document (by using either by using the Refresh or Reload toolbar buttons, or by selecting File/Open once again).

If you are able to see the new piece of text, you have successfully used Notepad to create your first Web page.

## **Processing Forms**

Although forms could simply be used to display information, HTML provides them in order to supply a way for the user to interact with a Web server. The most widely used method to process the data submitted through a form is to send it to server-side software typically written in a scripting language, although any programming language can be used. The figure below outlines the kind of processing that takes place.

1. The user retrieves a document containing a form from a Web server.
2. The user reads the Web page and interacts with the form it contains.
3. Submitting the form sends the form data to the server for processing.
4. The Web server passes the data to a CGI programme.

5. The CGI software may use database information or store data in a server-side database. HTML Forms
6. The CGI software may generate a new Web page for the server to return to the user.
7. The user reads the new Web document and may interact with it.

### **List of used HTML codes**

- Basic HTML
- Formatting
- Forms and Input
- Frames
- Images
- Audio / Video
- Links
- Lists
- Tables
- Styles and Semantics
- Meta Info

## **INTRODUCTION TO CASCADING STYLE SHEETS**

There is no format to follow for teaching the aesthetics of style - most people, though, can recognize something that follows a classical design. But some things can be said about the style of a website. For instance, when Web pages belong to the same website, each page should have a consistent look in order to provide familiarity for the user. Style sheets (sometimes referred to

as templates) are used in desktop publishing to provide consistency when formatting text. The format applied by the stylesheet could be to indent every first line of a paragraph by 2cm, insert a page break at the end of every chapter, and so on. Naturally, due to multimedia, Web pages not only have to consider text formatting, but also visual and sound presentation, and various multimedia formats in general. Before we continue, let us briefly discuss the advantages and disadvantages of using stylesheets.

## **Advantages of Style Sheets**

1. Multiple Styles - A single document can be presented in multiple styles by using multiple style sheets.

2. Re-styling - The use of style sheets (which are separate to the HTML files) allows the quick re-styling of any document, without modifying the original HTML.

3. Document maintenance - The ability to re-style many documents allows us to easily make changes to the appearance of many Web pages without separately editing each one.

4. Consistency - Style sheets guarantee consistency throughout website.

5. Optimal file size - The smaller the files the faster the download. Using style sheets can help minimize file sizes, since, for example, every < font > tag, is defined in one place in a style sheet, rather than in multiple places in the HTML file.

6. Style and structure - When first developed, HTML was only concerned with document markup and not with the document's formatting. This eventually changed, with more and more functionality being added to HTML to allow for formatting. With the introduction of style sheets, the HTML document is again concerned only with structural document markup — all formatting is now placed in the style sheet.

## **Few Benefits of HTML and CSS**

- **Cost effective and Multi-Platform Development:** A single piece of code can be used across platforms, devices and markets, this an added advantage because it results in lower development and maintenance costs, allowing you to use your resources elsewhere.

- **Good page ranking:** If your page is not structured well then the page itself will not attain a good rank within search engines. HTML5's new elements can be anticipated when site are being re-indexed on search engines.
- **Consistency across multiple web browsers:** The implementation of HTML and CSS helps the designer to create a compatible site or system within all browsers.
- **User Experience:** HTML5 offers wide range of design and presentation tools which gives the developers greater scope to produce better sites and web applications. This is very important from business point of view as user engagement is the key to increase site and system use and conversion.

## JQUERY

jQuery is a fast, small, cross-platform and feature-rich JavaScript library. It is designed to simplify the client-side scripting of HTML. It makes things like HTML document traversal and manipulation, animation, event handling, and AJAX very simple with an easy-to-use API that works on a lot of different type of browsers.

The main purpose of jQuery is to provide an easy way to use JavaScript on your website to make it more interactive and attractive. It is also used to add animation.

- jQuery is a small, fast and lightweight JavaScript library.
- jQuery is platform-independent.
- jQuery means "write less do more".
- jQuery simplifies AJAX call and DOM manipulation.

## jQuery Features

- HTML manipulation

- DOM manipulation
- DOM element selection
- CSS manipulation
- Effects and Animations
- Utilities
- AJAX
- HTML event methods
- JSON Parsing
- Extensibility through plug-ins

## **REQUIRMENTS OF JQUERY**

Sometimes, a question can arise that what is the need of jQuery or what difference it makes on bringing jQuery instead of AJAX/ JavaScript? If jQuery is the replacement of AJAX and JavaScript? For all these questions, you can state the following answers.

- It is very fast and extensible.
- It facilitates the users to write UI related function codes in minimum possible lines.
- It improves the performance of an application.
- Browser's compatible web applications can be developed.
- It uses mostly new features of new browsers.

So,that out of the lot of JavaScript frameworks, jQuery is the most popular and the most extendable. Many of the biggest companies on the web use jQuery.

Some of these companies are:

- Microsoft
- Google
- IBM
- Netflix

## **jQuery History**

jQuery was first released in January 2006 by **John Resig** at BarCamp NYC. It is currently headed by Timmy Wilson and maintained by a team of developers.

Nowadays, jQuery is widely used technology. Most of the websites are using jQuery.

## **jQuery Example**

jQuery is developed by Google. To create the first jQuery example, you need to use JavaScript file for jQuery. You can download the jQuery file from [jquery.com](http://jquery.com) or use the absolute URL of jQuery file.

In this jQuery example, we are using the absolute URL of jQuery file. The jQuery example is written inside the script tag.

Let's see a simple example of jQuery.

FILE: firstquery.html

```
<!DOCTYPE html>
<html>
<head>
<title>First jQuery Example</title>
<script type="text/javascript" src="http://ajax.googleapis.com/ajax/libs/jquery/2.1.
3/jquery.min.js">
</script>
<script type="text/javascript" language="javascript">
$(document).ready(function() {
$("p").css("background-color", "cyan");
});
</script>
</head>
<body>
<p>The first paragraph is selected.</p>
<p>The second paragraph is selected.</p>
<p>The third paragraph is selected.</p>
</body>
</html>
```

## jQuery Selectors

jQuery Selectors are used to select and manipulate HTML elements. They are very important part of jQuery library.

With jQuery selectors, you can find or select HTML elements based on their id, classes, attributes, types and much more from a DOM.

In simple words, you can say that selectors are used to select one or more HTML elements using jQuery and once the element is selected then you can perform various operation on that.

All jQuery selectors start with a dollar sign and parenthesis e.g. `$()`. It is known as the factory function.

## jQuery Features

jQuery simplifies various tasks of a programmer by writing less code. Here is the list of important core features supported by jQuery –

- **DOM manipulation** – The jQuery made it easy to select DOM elements, negotiate them and modifying their content by using cross-browser open source selector engine called **Sizzle**.
- **Event handling** – The jQuery offers an elegant way to capture a wide variety of events, such as a user clicking on a link, without the need to clutter the HTML code itself with event handlers.
- **AJAX Support** – The jQuery helps you a lot to develop a responsive and featurerich site using AJAX technology.
- **Animations** – The jQuery comes with plenty of built-in animation effects which you can use in your websites.
- **Lightweight** – The jQuery is very lightweight library - about 19KB in size (Minified and gzipped).
- **Cross Browser Support** – The jQuery has cross-browser support, and works well in IE 6.0+, FF 2.0+, Safari 3.0+, Chrome and Opera 9.0+
- **Latest Technology** – The jQuery supports CSS3 selectors and basic XPath syntax.

## Ajax

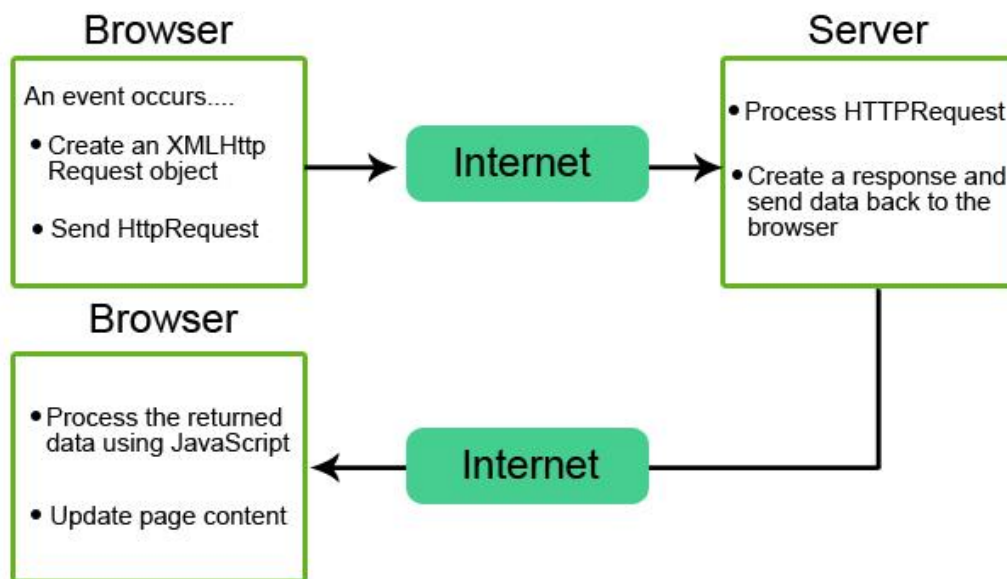
AJAX is an acronym for **Asynchronous JavaScript and XML**. It is a group of inter-related technologies like JavaScript, DOM, XML, HTML/XHTML, CSS, XMLHttpRequest etc.

AJAX allows you to send and receive data asynchronously without reloading the web page. So it is fast. AJAX allows you to send only important information to the server not the entire page. So only valuable data from the client side is routed to the server side. It makes your application interactive and faster.

## How Does It Work?

It creates more interactive techniques for faster and more **efficient web applications** by using JavaScript, XML, CSS, and HTML. For various web applications, Ajax uses various techniques like this.

- In Ajax, when the user needs to create content, XHTML is used while CSS is used for presenting the user request purpose; the document object model (DOM) and javascript both will be used to display the content dynamically.
- By using synchronous methods in web applications, information can be transmitted and received effectively, for example, when you fill a form and submit it. You will be automatically directed to the new server with that page information.
- After hitting the submit button in the background, javascript sends a request, and with the response generated, it will update to the current screen. In this process, the user will be unaware of the background XML code requests.
- XML is used as a format to generate and receive the server data in any format.
- While most web browsers are dependent on web server technology, it is independent of web server software.



## Where to Use It?

Below mentioned are the places where Ajax is used.

**Login forms:** Eg: user can type their login credentials in the original page form; their software will send a request to the server to logged in, and the page will be updated as needed.

**Auto-complete:** When you run a query in the Google search bar with the help of autofill settings, suggestions will be shown in drop down below

**Rating and Voting:** The voting can decide the site's main content in web pages like Digg and Reddit by bookmarking them.

**Updating with user content:** When a user posts a tweet, it will be added to their feed, and everything is updated.

Now it is used by tweeter to run their trending topics page

- Form submission and validation
- It makes web applications quicker, and the numbers of responses are also reduced.
- Light-boxes are used nowadays instead of pop-ups
- Using Ajax with flash application

## **Ajax Used for**

Ajax is a web developer's long term dream because the user can do the following things:

1. Without reloading the page, the user request can be updated
2. After the page is loaded, it generates data from the server.
3. Receive data from the server after the page has loaded.
4. In the background, sends data to the server

## **Examples of Ajax Application**

Given below are the lists of web applications that commonly use Ajax

- Google suggests that auto-complete options will be offered while typing when a user enters the search query in the Google search bar. Suggestions given by Google can be navigated by using operational keys.
- Yahoo maps are easier while operating, and user experiences more fun. This Map uses Ajax to drag the entire map with the mouse without using buttons that will be at ease to the user.

- Google maps are general applications that use Ajax. This is a real-time application in which the user can manipulate the data and change the view settings. Ajax directly works on a web browser without any plugin installations. Firstly, only Microsoft internet explorer used Ajax, but due to its reliability, more web applications like chrome, Mozilla... Etc. using this.

Ajax applications use an intermediate engine that acts as a bridge between browser and server. Ajax is not a programming language.

## **Advantages and Disadvantages of Ajax**

Every software has its pros and cons, which gives good results when handled in a correct way.

### **ADVANTAGES**

- Reduces the server traffic and increases the speed
- It is responsive, and the time taken is also less
- Form validation
- Bandwidth usage can be reduced
- Asynchronous calls can be made; this reduces the time for data arrival.

### **DISADVANTAGES**

- Open-source
- Active x request is created only in internet explorer and a newly created web browser.
- For security reasons, you can only access information from the web host that serves pages. Fetching information from other servers is not possible with Ajax.

## **jQuery AJAX Introduction**

AJAX stands for "Asynchronous JavaScript and XML". JavaScript includes features of sending asynchronous http request using `XMLHttpRequest` object. Ajax is about using this ability of JavaScript to send asynchronous http request and get the xml data as a response

(also in other formats) and update the part of a web page (using JavaScript) without reloading or refreshing entire web page.

The following table lists all the Ajax methods of jQuery.

jQuery Ajax Methods	Description
ajax()	Sends asynchronous http request to the server.
get()	Sends http GET request to load the data from the server.
Post()	Sends http POST request to submit or load the data to the server.
getJSON()	Sends http GET request to load JSON encoded data from the server.
getScript()	Sends http GET request to load the JavaScript file from the server and then executes it.
load()	Sends http request to load the html or text content from the server and add them to DOM element(s).

The jQuery library also includes following events which will be fired based on the state of the Ajax request.

jQuery Ajax Events	Description
ajaxComplete()	Register a handler function to be called when Ajax requests complete.
ajaxError()	Register a handler function to be called when Ajax requests complete with an error.
ajaxSend()	Register a handler function to be called before Ajax request is sent.
ajaxStart()	Register a handler function to be called when the first Ajax request begins.
ajaxStop()	Register a handler function to be called when all the Ajax requests have completed.
ajaxSuccess()	Register a handler function to be called when Ajax request completes successfully.

### **Advantages of jQuery Ajax**

1. Cross-browser support
2. Simple methods to use
3. Ability to send GET and POST requests
4. Ability to Load JSON, XML, HTML or Scripts

### **jQuery ajax() Method**

The jQuery ajax() method provides core functionality of Ajax in jQuery. It sends asynchronous HTTP requests to the server.

## SYNTAX

```
$.ajax(url);
```

```
$.ajax(url,[options]);
```

### Parameter description:

- url: A string URL to which you want to submit or retrieve the data
- options: Configuration options for Ajax request. An options parameter can be specified using JSON format. This parameter is optional.

## PYTHON

- Python laid its foundation in the late 1980s.
- The implementation of Python was started in December 1989 by **Guido Van Rossum** at CWI in Netherland.
- In February 1991, **Guido Van Rossum** published the code (labeled version 0.9.0) to alt.sources.
- In 1994, Python 1.0 was released with new features like lambda, map, filter, and reduce.
- Python 2.0 added new features such as list comprehensions, garbage collection systems.
- On December 3, 2008, Python 3.0 (also called "Py3K") was released. It was designed to rectify the fundamental flaw of the language.
- *ABC programming language* is said to be the predecessor of Python language, which was capable of Exception Handling and interfacing with the Amoeba Operating System.

### Why the Name Python?

There is a fact behind choosing the name Python. **Guido van Rossum** was reading the script of a popular BBC comedy series "**Monty Python's Flying Circus**". It was late on-air 1970s.

Van Rossum wanted to select a name which unique, sort, and little-bit mysterious. So he decided to select naming Python after the "**Monty Python's Flying Circus**" for their newly created programming language.

The comedy series was creative and well random. It talks about everything. Thus it is slow and unpredictable, which made it very interesting.

Python is also versatile and widely used in every technical field, such as

- Machine Learning,
- Artificial Intelligence,
- Web Development,
- Mobile Application,
- Desktop Application, Scientific Calculation, etc.

## **Usage of Python**

Python is a general purpose, open source, high-level programming language and also provides number of libraries and frameworks. Python has gained popularity because of its simplicity, easy syntax and user-friendly environment. The usage of Python as follows.

- Desktop Applications
- Web Applications
- Data Science
- Artificial Intelligence
- Machine Learning
- Scientific Computing
- Robotics
- Internet of Things (IoT)
- Gaming
- Mobile Apps
- Data Analysis and Preprocessing

## **Python Applications**

Python is known for its general-purpose nature that makes it applicable in almost every domain of software development. Python makes its presence in every emerging field. It is the fastest-growing programming language and can develop any application.

Here, we are specifying application areas where Python can be applied.



## Python Features

Python provides many useful features which make it popular and valuable from the other programming languages. It supports object-oriented programming, procedural programming approaches and provides dynamic memory allocation. We have listed below a few essential features.

### 1) Easy to Learn and Use

Python is easy to learn as compared to other programming languages. Its syntax is straightforward and much the same as the English language. There is no use of the semicolon or curly-bracket, the indentation defines the code block. It is the recommended programming language for beginners.

## **2) Expressive Language**

Python can perform complex tasks using a few lines of code. A simple example, the hello world program you simply type `print("Hello World")`. It will take only one line to execute, while Java or C takes multiple lines.

## **3) Interpreted Language**

Python is an interpreted language; it means the Python program is executed one line at a time. The advantage of being interpreted language, it makes debugging easy and portable.

## **4) Cross-platform Language**

Python can run equally on different platforms such as Windows, Linux, UNIX, and Macintosh, etc. So, we can say that Python is a portable language. It enables programmers to develop the software for several competing platforms by writing a program only once.

## **5) Free and Open Source**

Python is freely available for everyone. It is freely available on its official website [www.python.org](http://www.python.org). It has a large community across the world that is dedicatedly working towards make new python modules and functions. Anyone can contribute to the Python community. The open-source means, "Anyone can download its source code without paying any penny."

## **6) Object-Oriented Language**

Python supports object-oriented language and concepts of classes and objects come into existence. It supports inheritance, polymorphism, and encapsulation, etc. The object-oriented procedure helps to programmer to write reusable code and develop applications in less code.

## **7) Extensible**

It implies that other languages such as C/C++ can be used to compile the code and thus it can be used further in our Python code. It converts the program into byte code, and any platform can use that byte code.

## **8) Large Standard Library**

It provides a vast range of libraries for the various fields such as machine learning, web developer, and also for the scripting. There are various machine learning libraries, such as Tensor flow, Pandas, Numpy, Keras, and Pytorch, etc. Django, flask, pyramids are the popular framework for Python web development.

## 9) GUI Programming Support

Graphical User Interface is used for the developing Desktop application. PyQt5, Tkinter, Kivy are the libraries which are used for developing the web application.

## 10) Integrated

It can be easily integrated with languages like C, C++, and JAVA, etc. Python runs code line by line like C,C++ Java. It makes easy to debug the code.

## 11. Embeddable

The code of the other programming language can use in the Python source code. We can use Python source code in another programming language as well. It can embed other language into our code.

## 12. Dynamic Memory Allocation

In Python, we don't need to specify the data-type of the variable. When we assign some value to the variable, it automatically allocates the memory to the variable at run time. Suppose we are assigned integer value 15 to **x**, then we don't need to write **int x = 15**. Just write **x = 15**.

## Python Data Types

Variables can hold values, and every value has a data-type. Python is a dynamically typed language; hence we do not need to define the type of the variable while declaring it. The interpreter implicitly binds the value with its type.

```
a = 5
```

The variable **a** holds integer value five and we did not define its type. Python interpreter will automatically interpret variables **a** as an integer type.

Python enables us to check the type of the variable used in the program. Python provides us the **type()** function, which returns the type of the variable passed.

Consider the following example to define the values of different data types and checking its type.

```
a=10
b="Hi Python"
c = 10.5
print(type(a))
print(type(b))
print(type(c))
```

## Output:

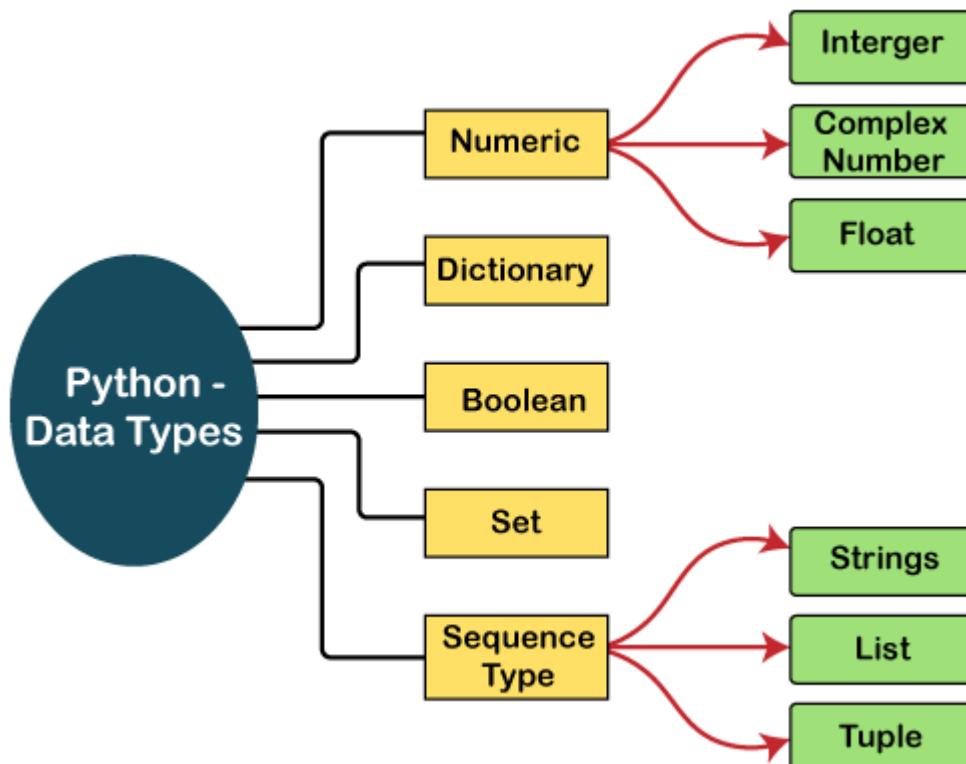
```
<type 'int'>
<type 'str'>
<type 'float'>
```

## Standard data types

A variable can hold different types of values. For example, a person's name must be stored as a string whereas its id must be stored as an integer.

Python provides various standard data types that define the storage method on each of them. The data types defined in Python are given below.

1. Numbers
2. Sequence Type
3. Boolean
4. Set
5. Dictionary



## **FLASK**

Flask is a web framework, it's a Python module that lets you develop web applications easily. It's has a small and easy-to-extend core: it's a microframework that doesn't include an ORM (Object Relational Manager) or such features.

It does have many cool features like url routing, template engine. It is a WSGI web app framework.

### **What is a Web Framework?**

A Web Application Framework or a simply a Web Framework represents a collection of libraries and modules that enable web application developers to write applications without worrying about low-level details such as protocol, thread management, and so on.

### **What is Flask?**

Flask is a web application framework written in Python. It was developed by Armin Ronacher, who led a team of international Python enthusiasts called Pocco. Flask is based on the Werkzeug WSGI toolkit and the Jinja2 template engine.Both are Pocco projects.

### **WSGI**

The Web Server Gateway Interface (Web Server Gateway Interface, WSGI) has been used as a standard for Python web application development. WSGI is the specification of a common interface between web servers and web applications.

### **Werkzeug**

Werkzeug is a WSGI toolkit that implements requests, response objects, and utility functions. This enables a web frame to be built on it. The Flask framework uses Werkzeug as one of its bases.

### **jinja2**

jinja2 is a popular template engine for Python.A web template system combines a template with a specific data source to render a dynamic web page.

This allows you to pass Python variables into HTML templates like this:

```
<html>
  <head>
    <title>{{ title }}</title>
  </head>
  <body>
    <h1>Hello {{ username }}</h1>
  </body>
</html>
```

## Microframework

Flask is often referred to as a microframework. It is designed to keep the core of the application simple and scalable.

Instead of an abstraction layer for database support, Flask supports extensions to add such capabilities to the application.

## Why is Flask a good web framework choice?

---

Unlike the Django framework, Flask is very Pythonic. It's easy to get started with Flask, because it doesn't have a huge learning curve.

On top of that it's very explicit, which increases readability. To create the "Hello World" app, you only need a few lines of code.

```
$ python server.py
* Serving Flask app "hello"
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```

It then starts a web server which is available only on your computer. In a web browser open localhost on port 5000 (the url) and you'll see "Hello World" show up. To host and develop online, you can use

It's a microframework, but that doesn't mean your whole app should be inside one single Python file. You can and should use many files for larger programs, to handle complexity.

Micro means that the Flask framework is simple but extensible. You may all the decisions: which database to use, do you want an ORM etc, Flask doesn't decide for you.

Flask is one of the most popular web frameworks, meaning it's up-to-date and modern. You can easily extend it's functionality. Scale it up for complex applications.

## Features of Flask

Some features which make Flask an ideal framework for web application development are:

1. Flask provides a **development server** and a **debugger**.
2. It uses **Jinja2** templates.
3. It is compliant with **WSGI 1.0**.
4. It provides integrated support for **unit testing**.
5. Many extensions are available for Flask, which can be used to enhance its functionalities.

A framework "is a code library that makes a developer's life easier when building reliable, scalable, and maintainable web applications" by providing reusable code or extensions for common operations. There are a number of frameworks for Python, including Flask, Tornado, Pyramid, and Django.

Each framework has a different way to put together its routes, models, views, database interaction, and overall application configuration. I'll describe those aspects of each framework in this series, which will begin with Flask.

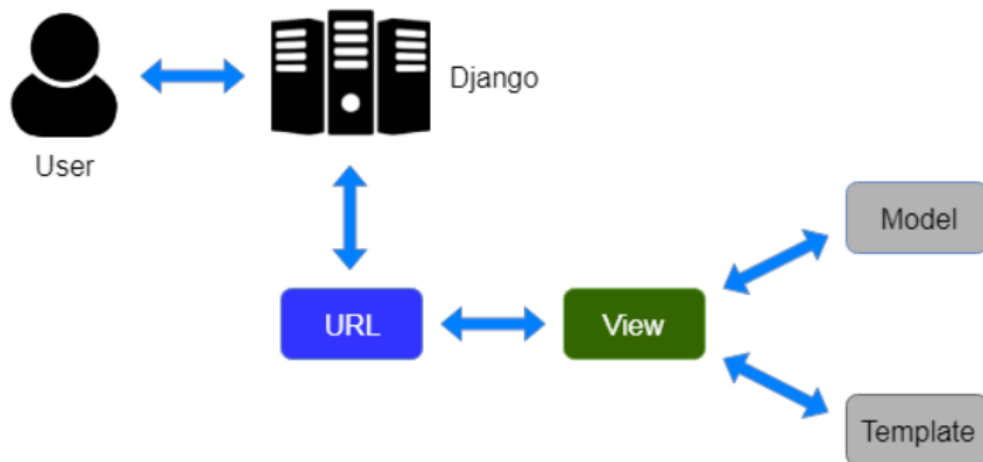
## DJANGO MVT STRUCTURE

The MVT (Model View Template) is a software design pattern. It is a collection of three important components Model View and Template. The Model helps to handle database. It is a data access layer which handles the data.

The Template is a presentation layer which handles User Interface part completely. The View is used to execute the business logic and interact with a model to carry data and

renders a template. Although Django follows MVC pattern but maintains its own conventions. So, control is handled by the framework itself.

There is no separate controller and complete application is based on Model View and Template.



A user requests for a resource to the Django, Django works as a controller and check to the available resource in URL. If URL maps, a view is called that interact with model and template, it renders a template.

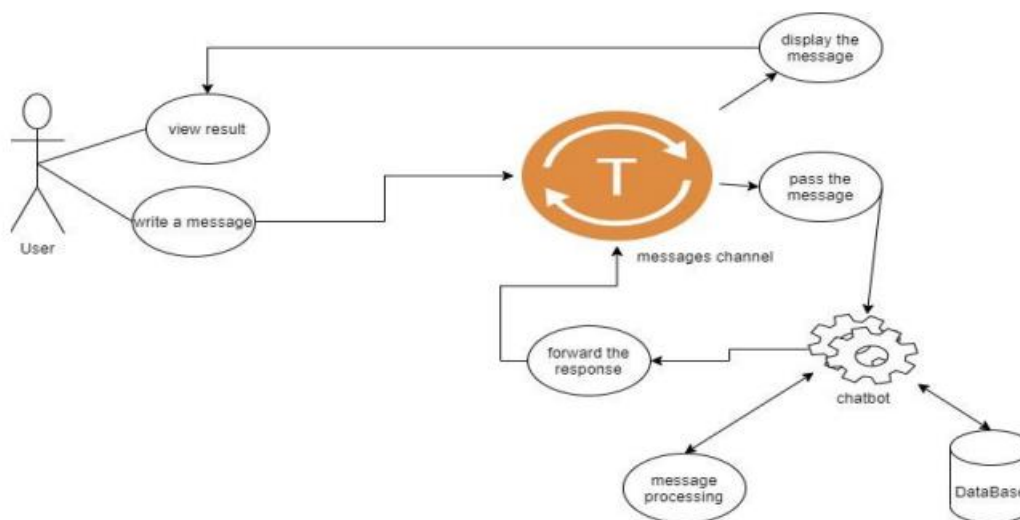
Django responds back to the user and sends a template as a response.

## CHAPTER IV

### SYSTEM DESIGN AND DEVELOPMENT

System design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirement. System design could be seen as the application of system theory to product development. It is the process of defining, developing and designing systems which satisfies the specific needs and requirements of a business or organization. It is meant to satisfy specific needs and requirements of a business or organization through the engineering of a coherent and well-running system.

#### SYSTEM FLOW DIAGRAM



#### MODULES

- Login
- Chatbot
- Logout

## **MODULES DESCRIPTION**

### **Login Form**

Company admin and customer log in to the website with a valid email Id and OTP. The staff can also manage some other details of the chatbot such as the welcome message, no result message for the query, and avatars.

### **Chatbot Form**

The chatbot form consist details of their product materials, working places, example plot size and design. It may help the customer to know about their basic things to know. A chatbot is a computer program that simulates human conversation through voice commands or text chats or both.

### **Logout Form**

The user can logout after they view the details and communicate with the chatbot.

## **INPUT DESIGN**

Input Design is the process of converting a user oriented description of the inputs to a computer-based business system into a programmer-oriented specification. Input data were found to be available for establishing and maintaining master and transaction files and for creating output records. Input Design deals with what data should be given as input, how the data should be arranged or code, the dialog to guide the operating personnel in providing input, methods for preparing input validations and steps to follow when error occur. Input design is the process of connecting the user-originated inputs into a computer to used formats. The goal of the input design is to make data entry Logical and free from errors. Errors in the input database controlled by input design this application is being developed in a user-friendly manner.

The forms are being designed in such a way that during the processing the cursor is placed in the position where the data must be entered. An option of selecting an appropriate input from the values of validation is made for each of the data entered. Concerning clients comfort the project is designed with perfect validation on each field and to display error messages with appropriate suggestions. Help managers are also provided whenever user entry to a new field he/she can understand what is to be entered. Whenever users enter a error data error manager displayed user can move to next field only after entering a correct data.

## **OUTPUT DESIGN**

The design of output is the most important task of any system. During output design, developers identify the type of outputs needed, and consider the necessary output controls and prototype report layouts. A quality output is one, which meets the requirements of the end user and presents the information clearly. The primary consideration in design of output is the information requirement and objectives of the end users. The major formation of the output is to convey the information and so its layout and design need a careful consideration.

There is an output display screen for showing the compressed/ decompressed file or folder details. Computer output is the most important and direct source of information to the user. Efficient intelligible output design should improve the system's relationship with the user and admin in decision-making. Output design generally refers to the results generated by the system. For many end users on the basis of the output evaluate the usefulness of the application. Efficient software must be able to produce and efficient effective reports.

## **DATA FLOW DIAGRAM**

A data Flow diagram (DFD) are used to graphically represent the flow of data I a business information system. DFD describes the processes that are involved in a system to transfer data from the input to the file storage and reports generation. It is a process orientation representation of an application system. It is a picture of the movement of data between external entities and the process and data stores within a system. It is a graphical representation of the "flow" of data through an information system. DFDs can also be used for the visualization of data processing. It provides no information about the timing of processes, or about whether processes will operate in sequence or in parallel. It is an element of structured analysis. It is graphical representation of a system or a system or a portion of a system. DFD in software engineering is a way of representing flow of data of a process or a system. A DFD uses defined symbols like circles, arrows and rectangles to represent data input, output, storage points and routs between each destination.

The components of a typical dataflow diagram are as follows,

- The process.
- The entity
- The flow.
- The data Base

### **DFD SYMBOLS:**



Process that transforms data flow



Entity



Data flow



Data Base or Table

### **PROCESS**

A process receives input data and process output data with a different form or content. Every process has a name that identifies the function it performs. Process can be as simple as collecting input data and saving in the database or it may be as complex as producing monthly sales report of any particular product in any selected region.

### **EXTERNAL ENTITY**

External entities are objects outside the system with which system communicates. These are sources and destinations of the system inputs and outputs. They are also known as terminators, sinks, sources or actors.

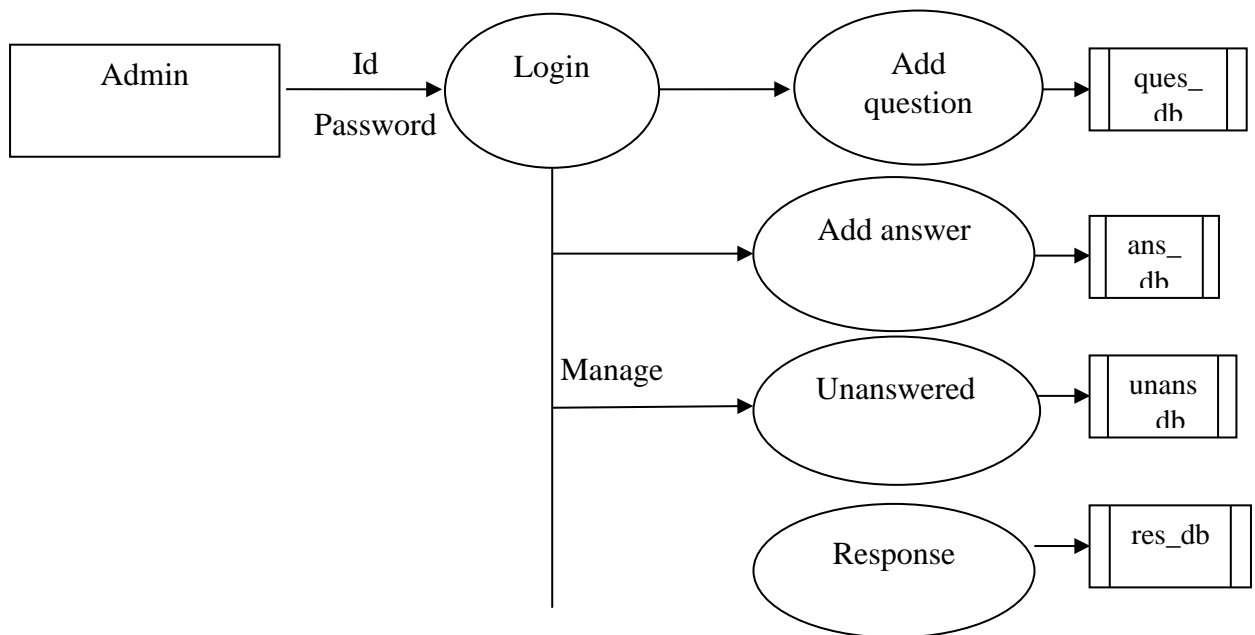
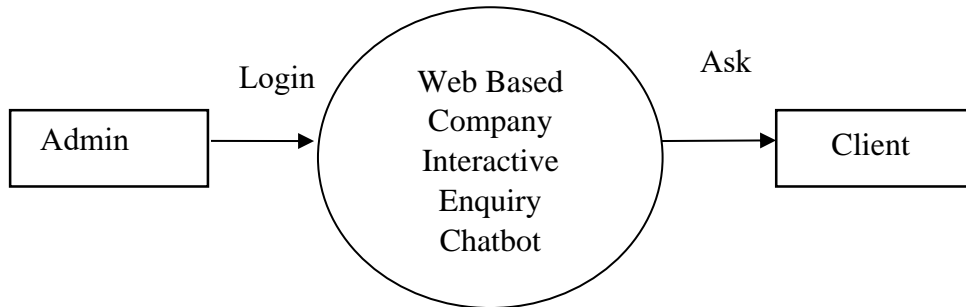
### **DATA FLOW**

Data flow is the path for data to move from one part of the system to another. It may be a single data element or set of data element. The symbol of data flow is the arrow. The arrow shows the flow direction.

### **DATA BASE**

Data store are repositories of data in the system. They sometimes also referred as files. Each data store receives a simple label such as Order.

# DATA FLOW DIAGRAM



## **ENTITY RELATIONSHIP DIAGRAM**

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties. By defining the entities, their attributes, and showing the relationships between them, an ER diagram illustrates the logical structure of databases. ER diagrams are used to sketch out the design of a database. The Entity-Relationship (ER) model is a conceptual data model that views the real world as entities and relationships. A basic component of the model is the Entity-Relationship diagram, which is used to visually represent data objects. The model has been extended and today it is commonly used for database design. The entity relationship diagram is based on a perception of real world that consists of a collection of basic objects, called entities and of relationship among the objects. Entities are described in a database by a set of attributes. The set of all entities of the same type, and the set of all relationships of the same type, are termed as an entity set, and relationship set respectively. The overall logical structure of a database can be expressed graphically by an entity relationship diagram, which is built up using the notations.

## **DATA MODEL**

Entity Relationship Diagram is a model that describes the stored data layout of a system at high level of abstraction. Entity Relationship Diagram enables us to examine and highlight data structures and relationship independent of the processes or control flow. The participation of the entities in the relationship and cardinality ratio are indicated in the entity relationship diagram to provide further information. The Entity Relationship Diagram shows the relationship and types of relationship between the entities.. The major components are

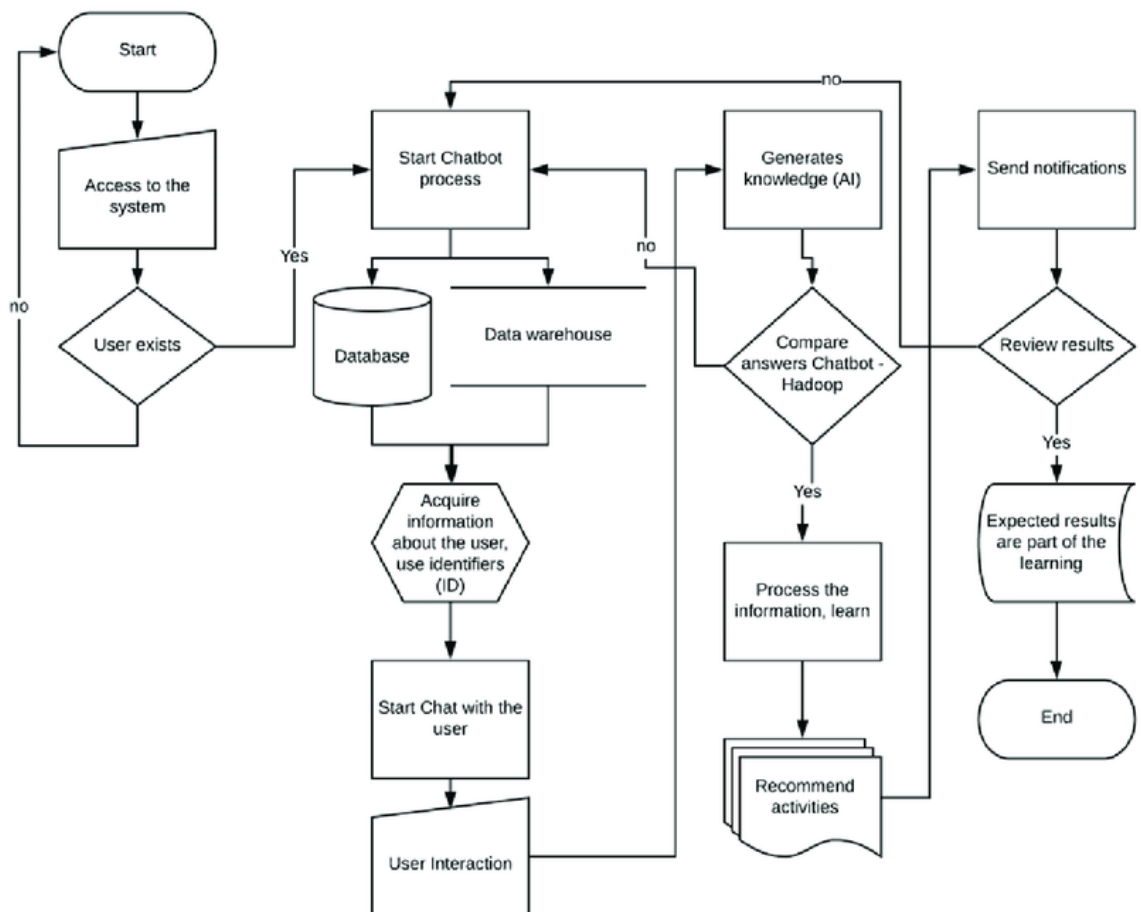
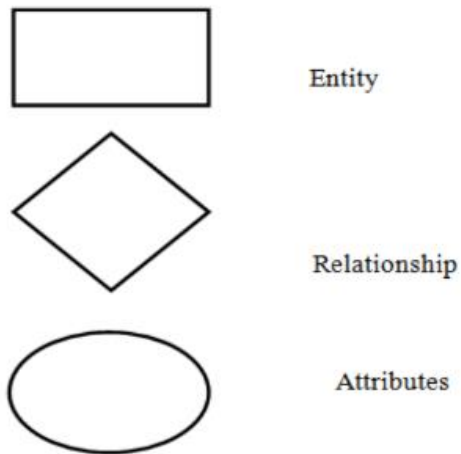
- Rectangle - represent the entity sets
- Ellipses - which represents attributes
- Diamond - which represent relationship set
- Line - which links the attributes to entity sets and entity sets to relationship set

## **FEATURES OF ER MODEL**

- It maps well to relational model.
- It is simple and easy to understand with minimum of training. Therefore, database designer to communicate with the end user can use the model.

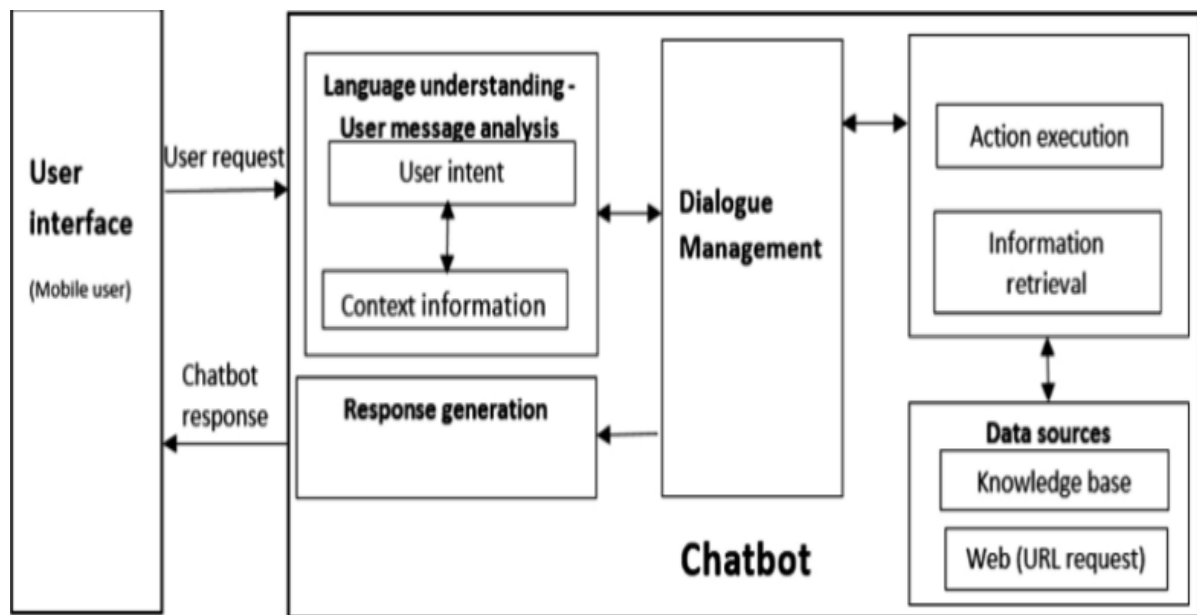
- In addition, the model can be used as a design plan by the database to implement a data model in specific database management software.

**ER-DIAGRM SYMBOL**



## Architecture

A general architectural design and delve deep into the important parts of each component. A general chatbot architecture consists of five main components, a User Interface component, a Natural Language Understanding (NLU) component, a Dialogue Management (DM) component, a Backend component, and a Response Generation (RG) Component



## PROGRAM CODINGS

### Log In

### Page 1

### HTML

```
<!DOCTYPE html>

<html>

  <head>

    <meta charset="UTF-8">

    <title> Login </title>

    <link rel="stylesheet" href="{{ url_for('static', filename='css/style.css') }}"
type="text/css">

    <link rel="stylesheet" href="{{ url_for('static', filename='css/bootstrap.min.css') }}" type="text/css">

    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">

  </head>

  <body>

    <section>

      <div class="container-fluid login-wrap" style=" background: transparent
url('/static/img/bg.jpg') 0% 0% no-repeat padding-box;background-size: cover;">

        <h3 class="login-heading">ESTHETE CHATBOT</h3>

        <div class="d-flex justify-content-center">

          <div class="loginPage">

            <div class="login-header text-center">

            </div>

          </div>

        </div>

      </div>

    </body>

  </html>
```

```

<form action = "{{ url_for('verify') }}" method = "POST">
  <i class="fa fa-envelope" aria-hidden="true"></i>
  <label>Email Address</label>
  <input type="email" name="email" placeholder="Email_id"
required>
  <input type = "submit" value="Next">
  </form>
</div>
</div>
</div>
</section>
<script src="{{ url_for('static',filename='js/jquery-
3.5.1.min.js')}}"></script>
<!-- <script src="{{ url_for('static',filename='js/multitag.js')}}"></script> -->
<script src="{{ url_for('static',filename='js/popper.min.js')}}"></script>
<script src="{{ url_for('static',filename='js/bootstrap.min.js')}}"></script>
</body>
</html>

```

**page 2 :**

```

<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8">

```

```

<title> Login </title>

<link rel="stylesheet" href="{{ url_for('static', filename='css/style.css') }}"
type="text/css">

<link rel="stylesheet"
href="{{ url_for('static',filename='css/bootstrap.min.css') }}" type="text/css">

<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">

</head>

<body>

<section>

<div class="container-fluid login-wrap" style=" background: transparent
url('/static/img/bg.jpg') 0% 0% no-repeat padding-box;background-size: cover;">

<h3 class="login-heading">ESTHETE CHATBOT</h3>

<div class="d-flex justify-content-center">

<div class="loginPage">

<div class="login-header text-center">



</div>

<!-- <form action = "{{ url_for('verify') }}" method = "POST">

<i class="fa fa-envelope" aria-hidden="true"></i>

<label>Email Address</label>

<input type="email" name="email" placeholder="Email_id"
required>

<input type = "submit" value="Submit">

</form> -->

{% with messages = get_flashed_messages() %}

{% if messages %}

{% for message in messages %}

```

```

        <div id = 'closed' class="alert alert-danger alert-dismissible"
role="alert">
        {{ message }}
        <button type="button" class="btn-close" data-bs-
dismiss="alert" aria-label="Close" onclick=delete_flash(this)>
            <span aria-hidden="true"></span>
        </button>
    </div>
    {% endfor %}
    {% endif %}
    {% endwith %}
    <form action = "{{ url_for('validate') }}" method="post">
        <i class="fa fa-key" aria-hidden="true"></i>
        <!-- <h4> OTP has been sent to the email id. Please check the
email for the confirmation.</h4> -->
        <label>Enter OTP(One-time password):</label>
        <input type="text" name="otp" placeholder="OTP"
required>
        <input type="submit" value="Submit">
    </form>

    </div>
</div>
</div>
</section>
<script src="{{ url_for('static',filename='js/jquery-
3.5.1.min.js') }}"></script>
<!-- <script src="{{ url_for('static',filename='js/multitag.js') }}"></script> -->
<script src="{{ url_for('static',filename='js/popper.min.js') }}"></script>

```

```
<script src="{ {url_for('static',filename='js/bootstrap.min.js')} }"></script>
<script>setTimeout(function() {
    $('#closed').fadeOut('fast');
}, 5000); // <-- time in milliseconds</script>
</body>
</html>
```

## **Python and Flask :**

```
from flask import *
from flask_mail import *
from random import *

app = Flask(_name_)
# app.secret_key = 'your secret key'
app.secret_key = "PROJECT"
mail = Mail(app)
app.config["MAIL_SERVER"]='smtp.gmail.com'
app.config["MAIL_PORT"] = 465
app.config["MAIL_USERNAME"] = 'esthetefabhomes@gmail.com'
app.config['MAIL_PASSWORD'] = 'bhdqjrqmrcgeeacu'
app.config['MAIL_USE_TLS'] = False
app.config['MAIL_USE_SSL'] = True
mail = Mail(app)

@app.route('/verify',methods = ["POST"])
```

```

def verify():
    email = request.form["email"]
    msg = Message('OTP',sender = 'username@gmail.com', recipients = [email])
    msg.body = str(otp)
    mail.send(msg)
    return render_template('verify.html')

@app.route('/validate',methods=["POST"])
def validate():
    user_otp = request.form['otp']
    if otp == int(user_otp):
        msg = 'Logged in successfully !'
        return render_template('index.html')
    flash('Invalid OTP')
    return render_template('verify.html')

```

**Chatbot :**

**HTML and CSS :**

```

<!DOCTYPE html>
<html>
  <head>
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">
    <title></title>
    <script src='https://code.responsivevoice.org/responsivevoice.js'></script>

```

```
<meta charset="UTF-8" />
<link href="https://fonts.googleapis.com/css?family=Josefin+Sans"
rel="stylesheet">

</head>
<style>
    html,body
{
padding:0;
margin:0;
max-width:100%;
user-select:none;
-ms-user-select:none;
-moz-user-select:none;
-webkit-user-select:none;
background-color:#4ec2ae;

}
#h{
Color:#fff;
Border-radius:5px;
}
.sign-logo {
font-weight: 600;
font-size: 24px;
color: #1e88e5;
/* text-align: right; */
/* display: inherit; */
```

```

    position: absolute;
    right: 30px;
    /* margin-right: 16px; */
    margin-top: -46px;
}
#sign-out{
    color: #1e88e5;
    text-decoration: none;
}
.shadow
{

    -webkit-box-shadow: 0 3px 3px 0 rgba(0, 0, 0, 0.14), 0 1px 7px 0 rgba(0, 0, 0, 0.12), 0 3px 1px -1px rgba(0, 0, 0, 0.2);

    box-shadow: 0 3px 3px 0 rgba(0, 0, 0, 0.14), 0 1px 7px 0 rgba(0, 0, 0, 0.12), 0 3px 1px -1px rgba(0, 0, 0, 0.2);

}

.nice-font
{
    font-family:'Josefin Sans',sans-serif;
}

header
{
    text-align:center;

```

```
}
```

```
main
```

```
{
```

```
padding:10px;
```

```
margin-bottom:50px;
```

```
}
```

```
footer #command
```

```
{
```

```
position:fixed;
```

```
bottom:0;
```

```
width:100%;
```

```
padding:7px 7px;
```

```
padding-right:7px;
```

```
margin-bottom:5px;
```

```
border-radius:30px;
```

```
border:0.5px solid #9e9e9e50;
```

```
-ms-box-sizing:border-box;
```

```
box-sizing:border-box ;
```

```
background-color:#fff;
```

```
}
```

```
#command input
```

```
{
```

```
display:block;
```

```
width:73%;
float:left;

}

#command input,#command button
{

padding:10px 15px;
border:0;
outline:0;
}

button
{
background-color:#1e88e5;
color:#fff;
border-radius:20px;
font-weight:300;
float:right;

}

.row
{
```

```
width:100%;  
margin-bottom:10px;  
display:block;  
}
```

```
.row::after{  
  content: "";  
  display: table;  
  clear: both;  
}
```

```
.chat  
{  
  border:0;  
  word-wrap:break-word;  
  background-color:#fff;  
  border-radius:30px;  
  color:#111;  
  padding:10px 20px;  
  display:inline-block  
}
```

```
.question  
{  
  float:right;  
  background-color:#1e88e5;  
  color:#fff;  
}
```

```
.answer
```

```
{  
  float:left;  
}
```

```
</style>
```

```
<body>
```

```
  <header>
```

```
    <h1 class="nice-font" id="h" >Esthete Chatbot</h1>
```

```
    <div class="sign-logo">
```

```
      <a class="fa fa-sign-out" id='sign-out' aria-hidden="true" href="{  
url_for('logout') } }"></a>
```

```
    </div>
```

```
  </header>
```

```
  <main class="nice-font">
```

```
</main>
```

```
<div id="last"></div>
```

```
<footer>
```

```
  <div id="command">
```

```
    <input placeholder="Input command here " type="text" />
```

```
    <button class="shadow nice-font" id = "submit">Δ</button>
```

```
  </div>
```

```

</footer>
<script src="{{url_for('static',filename='js/jquery-
3.5.1.min.js')}}"></script>
<script src="{{url_for('static',filename='js/multitag.js')}}"></script>
<script src="{{url_for('static',filename='js/popper.min.js')}}"></script>
<script src="{{url_for('static',filename='js/bootstrap.min.js')}}"></script>
</body>
</html>

```

## **Jquery and Ajax :**

```

<script>
    const ThingsICanDo = [
        "What's your name ?",
        "What's my name ?",
        "What's the time ?",
        "What date is it today?",
        "Hello Esthete",
        "Tell me a story",
        "your best friend",

        "Play Games",
        "How are you ?",
        "calculations",

```

"lol",  
  
"best programming language",  
"Good Night",  
"Good Morning",  
"Good Afternoon",  
"happy diwali",  
"Open news",  
"i love you",  
"Tell me some facts",  
"open facebook",  
"tell me a joke",  
"commands",  
"list",  
"features",  
  
"open flipkart",  
"open twitter",  
"open codepen",  
"open google",  
"open bing",  
"open cricbuzz",  
"open chrome",  
"open youtube",  
"shutdown",  
];

```
const ListThings = ThingsICanDo => "You can try asking the following:  
<br><br><br>" + ThingsICanDo.join("<br><br>");
```

```
const Random = list => list[Math.floor(Math.random()*list.length)];
```

```
const WhatCanIDo = ThingsICanDo => Random(ThingsICanDo);
```

```
const Links = {  
  "facebook" : "https://www.facebook.com",  
  "google" : "https://www.google.in",  
  "twitter" : "https://www.twitter.com",  
  "youtube" : "https://www.youtube.com",  
  "flipkart" : "https://flipkart.com",  
  "codepen" : "https://codepen.io",  
  "cricbuzz" : "https://www.cricbuzz.com",  
  "bing" : "https://www.bing.com",  
  "Weather" : "https://www.bbc.com/weather",  
  "news" : "https://www.bbc.com/news",  
  "chrome" : "https://www.google.com/chrome",  
  "game" : "https://iogames.space/",  
  "calculations" :  
  "https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.calcul  
ator.net/&ved=2ahUKEwjZtc_KrfvuAhX3xzgGHYCyC88QFjAEegQIJxAC&u  
sg=AOvVaw2WV3RjBeKCGyY49sfmLINK&cshid=1613923530345"  
  
};
```

```
const getLink = siteName => `Click here to open <a
href="{Links[siteName]}" target="_blank">${siteName}</a>`;
```

```
const Jokes = [
```

"A man is smoking a cigarette and blowing smoke rings into the air. His girlfriend becomes irritated with the smoke and says, 'Can't you see the warning on the cigarette pack? Smoking is hazardous to your health!' to which the man replies, 'I am a programmer. We don't worry about warnings; we only worry about errors.'",

"Jesus and Satan have an argument as to who is the better programmer. This goes on for a few hours until they come to an agreement to hold a contest with God as the judge. They set themselves before their computers and begin.  
<br><br>They type furiously, lines of code streaming up the screen, for several hours straight. Seconds before the end of the competition, a bolt of lightning strikes, taking out the electricity. Moments later, the power is restored, and God announces that the contest is over. <br><br>He asks Satan to show his work. Visibly upset, Satan cries and says, 'I have nothing. I lost it all when the power went out.' 'Very well,' says God, 'let us see if Jesus has fared any better.' Jesus presses a key, and the screen comes to life in vivid display, the voices of an angelic choir pour forth from the speakers. Satan is astonished. He stutters, 'B-b-but how?! I lost everything, yet Jesus' program is intact! How did he do it?' God chuckles, 'Everybody knows... Jesus saves.'",

"Two strings walk into a bar and sit down. The bartender says, 'So what'll it be?' The first string says, 'I think I'll have a beer quag fulk boorg jdk^CjfdLk jk3s d#f67howe%^U r89nvy owmc63^Dz x.xvcu' to which the second string says 'Please excuse my friend, he isn't null-terminated.'",

"Q) 0 is false and 1 is true, right? <br><br>A) 1.",

"To understand what recursion is, you must first understand recursion.",

"Q) How do functions break up? <br><br>A) They stop calling each other!",

"Q) When is a function a bad investment? <br><br>A) When there's no return!",

"Q) When do two functions fight? <br><br>A) When they have arguments!",

"Q) What did the suicidal function say? <br><br>A) 'GOODBYE WORLD'",

"Q) What did the flirtatious function say? <br><br>A) 'Call me ;)'",

"Q) What happened to all the illegal exceptions? <br><br>A) They were all caught!",

"Q) Why was the JavaScript reality show cancelled after only one episode? <br><br>A) People thought it seemed scripted!",

"If you put a million monkeys on a million keyboards, one of them will eventually write a Java program. The rest of them will write Perl programs.",

"Q) The programmer got stuck in the shower. Why? <br><br>A) Because the instructions on the shampoo bottle said 'Lather, Rinse, Repeat'.",

"There are 10 types of people. Those who understand binary and those who don't.",

"Q) Why do programmers always mix up Halloween and Christmas? <br><br>A) Because Oct 31 == Dec 25!",

"An int, a char, and a string walk into a bar and order some drinks. A short while later, the int and char start hitting on the waitress who gets very uncomfortable and walks away. The string walks up to the waitress and says 'You'll have to forgive them, they're primitive types.'",

"Q) What does a network administrator say when he gets back to home from work? <br><br>A) There's no place like 127.0.0.1",

"Q) Why do Java programmers wear glasses? <br><br>A) Because they don't C# (see-sharp)!",

"Java and C were telling jokes. It was C's turn, so he writes something on the wall, points to it and says 'Do you get the reference?' but Java didn't.",

"Q) How many software engineers does it take to change a light bulb? <br><br>A) None. That's a hardware problem.",

"Q) Why are Assembly programmers always soaking wet? <br><br>A) They work below C-level.",

"A programmer and a business analyst are sitting in the break room one day eating lunch when suddenly the microwave catches fire. Thinking quickly, the analyst leaps up, unplugs the microwave, grabs the trash can, fills it with water from sink, and dumps the water on the microwave to put out the flames.

<br><br>A few weeks later the two are again having lunch in the break room when suddenly the coffee maker bursts into flames. The programmer leaps up, grabs the coffee maker, shoves it into the microwave oven, and then hands the

trash can to the business analyst, thus re-using the solution developed for the previous project.",

"A programmer is walking along a beach and finds a lamp. He rubs the lamp, and a genie appears. 'I am the most powerful genie in the world. I can grant you any wish, but only one wish.' <br><br>The programmer pulls out a map, points to it and says, 'I'd want peace in the Middle East.' The genie responds, 'Gee, I don't know. Those people have been fighting for millenia. I can do just about anything, but this is likely beyond my limits.' <br><br>The programmer then says, 'Well, I am a programmer, and my programs have lots of users. Please make all my users satisfied with my software and let them ask for sensible changes.' At which point the genie responds, 'Um, let me see that map again.'",

"When Shakespeare asked, To be, or not to be?, he did not provide the answer. But programming can. Well, the answer is FF. <br><br>2B | ~ 2B = FF",

"A programmer's wife calls him and tells, 'While you're out, buy some milk.' He never returns home.",

"Q) Why did the Integer drown? <br><br>A) Because he couldn't Float!",

"Once a programmer drowned in the sea. Many Marines were at that time on the beach, but the programmer was shouting 'F1 F1' and nobody understood it.",

"A programmer walks to the butcher shop and buys a kilo of meat. An hour later he comes back upset that the butcher shortchanged him by 24 grams.",

"Q) Why did the web developer send a few extra bucks to his hosting provider? <br><br>A) Because he heard that he should always tip his server.",

"Q) Why did the web designer storm out of the restaurant? <br><br>A) She was offended by the table layout.",

"Me: '[Company] tech support, how may I help you?' <br><br>Caller: 'Hi, I've got a problem. Your program is telling me to get a pet snake. I don't want one.' <br><br>Me: 'Excuse me?' <br><br>Caller: 'It's giving me a message telling me I need a snake to run it.' <br><br>Me: 'Read the message to me please.' <br><br>Caller: 'Error: Python required to run script.'",

"Q) In key chain of an SQL table, all keys were 'Made in USA' except one which was 'Made in China'. Why? <br><br>A) Because it was a 'foreign' key.",

"Q) Why are Apple products so focused on 'Retina' display? <br><br>A) Because their 'Objective' is to 'C'",

"In a programming exam for students to get a job: <br><br>Question : String concatenation. <br><br>One student, works on but gets runtime error. Output is something like this : <br>Enter String one : ABC <br>Enter String two : XYZ <br>Segmentation Fault <br><br>He was not able correct it, and finally it was time, here's what he showed to teacher. <br>Enter String one : Segmentation <br>Enter String two : Fault <br>Segmentation Fault",

"Q) How do you explain the movie Inception to a programmer? <br><br>A) Basically, when you run a VM inside another VM, inside another VM, inside another VM..., everything runs real slow!",

"A programmer's wife told him that she can't open the jar to which he said 'Download and Install Java.'",

"She: What can you do for me? <br><br>He: Umm.. I can say I love you in 5 languages! <br><br>She: Really? Wow.. Do it...! <br><br>He: Here you go... <br>Java: System.out.println("I Love You"); <br>C: printf("\n I Love You \n"); <br>C++: cout << "I Love You \n"; <br>Ruby: puts "I Love You" <br>Python: print "I Love You" <br><br>Punch. Slap. Break up. Block.",

"Computer science is the realization of the fact that even though there is a wonderful dining table where 5 very intelligent hungry philosophers sit with lots of food and 5 forks but still all of them may die of starvation.",

"If debugging is the process of removing bugs, then programming must be the process of putting them in.",

"Programmer 1: I used variables called 'I' and 'I' in the same method. <br><br>Programmer 2: Capital 'i' and small 'L'? I too like to live dangerously.",

"StackOverflow developers have the hardest job on the internet. When their site goes down, they have to fix it without StackOverflow.",

"Q) What do you call 8 hobbits? <br><br>A) A hobbyte.",

"Three logicians walk into a bar. <br><br>Bartender: Beers for all? <br>Logician 1: I don't know. <br>Logician 2: I don't know. <br>Logician 3: Yes, please!",

"Person 1: If I install Windows 7 - 32 bit two times, will it become 64 bit? <br><br>Person 2: Yes, but it will also become Windows 14.",

"Error 4:04! <br><br>SLEEP not found!",

"Two bytes meet. The first byte asks, 'Are you ill?' to which the second byte replies, 'No, just feeling a bit off.'",

"Eight bytes walk into a bar. The bartender asks, 'Can I get you anything?' to which the bytes reply 'Yeah, make us a double.'",

"Q) Why did the programmer quit his job? <br><br>A) Because he didn't get arrays (a-raise)!",

"Have you heard about the new Crazy super computer? It's so fast that it executes an infinite loop in 6 seconds.",

"A man complains of halleucinations. He goes to his doctor for help. His doctor says, 'Try C#.' The man replied, 'I've already tried it.' His doctor responds back and says, 'Well, if you already C#, then what could be the problem?' The man says, 'Whenever I compile programs, I see tons of errors, every time.' The doctor replied back, saying, 'Oh. That's perfectly normal. It can't be fixed. Try not being a programmer.'",

"Mom: Please go to the market and buy two bottles of milk. If there are eggs, buy six. <br><br>son comes back with six bottles of milk <br><br>Mom: What? I thought I told you to get only two bottles of milk. <br><br>Son: But there were eggs!",

"A SQL query goes into a bar, walks up to two tables and asks, 'Can I join you?'",

"One day, a prince goes to a lair to kill the dragon. The prince cuts off his head but two new heads appear. The prince cuts off the two heads and four appear, after cutting those off 16 appear. Then 32, 64, 128, and finally after the prince cuts off 256 heads the dragon dies. Why? It was an 8 bit dragon.",

"Normal person : My body is made of 70% water. <br><br>Programmer : Mine is 80% coffee.",

"There was once a young man who, in his youth, professed his desire to become a great writer. When asked to define 'Great' he said, 'I want to write stuff that the whole world will read, stuff that people will react to on a truly emotional level, stuff that will make them scream, cry, howl in pain and anger!' He now works for Microsoft, writing error messages.",

"Q) How do two programmers make money? <br><br>A) One writes viruses, the other anti-viruses.",

"Q) What is 001011010110101010100101010010101015 in binary? <br><br>A) A major glitch!",

"Q) How did the elephant destroy the database? <br><br>A) His truncate (trunk ate) it.",

"UNIX is basically a simple operating system, but you have to be a genius to understand the simplicity.",

"A system administrator has 2 problems: dumb users, smart users.",

"Q) How many prolog programmers does it take to fix a light bulb? <br><br>A) Yes.",

"Programmer Thinking : When I wrote this code, God and I understood what it does. Now, God only knows.",

"Does 4 years of computer science engineering and found a solution for problems with softwares : Restart the computer.",

"World Wide Web Conversation: <br><br>Wikipedia: 'I know everything!' <br>Google: 'I can find everything!' <br>Facebook: 'I know everybody!' <br>Internet: 'Without me, you are all nothing!' <br>Electricity: 'Yeah... keep talking, dummies.'",

"Teacher calls Student's Parent<br><br>Teacher : Hi, this is your son's school. We're having some computer trouble.<br>Parent : Oh, dear - Did he break something?<br><br>Teacher : In a way - Did you really name your son <b>Robert'); DROP TABLE Students;</b><br>Parent : Oh, yes - Little Bobby Tables, we call him.<br><br>Teacher : Well we've lost this year's student records. I hope you're happy.<br>Parent : And I hope you've learned to sanitize your database inputs.",

"Q) How does a programmer say goodbye? <br><br>A) I will C you later.",

"Q) What did the programmer have for breakfast? <br><br>A) Spam & Eggs.",

"Don't ask Database Administrators to help you move furniture. They've been known to drop tables.",

"Q) What did the switch statement say to the programmer? <br><br>A) Give me a break;"

];

```
const TellAJoke = Jokes => Random(Jokes);
```

const Facts =[

"The human body contains enough iron to make a three-inch long metal nail.",

"Feeling stressed or anxious? Calming music is said to lower heart rate and decrease tension, while upbeat music speeds pulse up.",

"The heart has its very own electrical system, which allows it to continue beating after it's been removed from the body. As long as there's an oxygen supply, it will keep pumping.",

"On an average day, the heart produces enough energy to power a truck for 20 miles.",

"If your eye was a digital camera, it would boast 576 megapixels – that translates to roughly \$3,000 of Canon equipment.",

"In your lifetime, you'll produce enough saliva to fill two swimming pools. ",

"Did you know that at this very moment you're shedding? Adult humans shed up to 600,000 particles of skin every hour, or 1.5 pounds per year. And we thought our dogs were bad ...",

"The human nose can remember up to 50,000 scents. Just hearing phrases like "new car," "bookstore," or "grandma's house" can awaken your memory.",

"THE TERM ASTRONAUT COMES FROM GREEK WORDS THAT MEAN STAR AND SAILOR.",

"It takes a photon up to 40,000 years to travel from the core of the sun to its surface, but only 8 minutes to travel the rest of the way to Earth.",

"Grasshoppers have ears in their bellies.", "Oxygen looks pale blue in its solid and liquid forms.", "Only letter which doesn't appear in the periodic table is 'J'.",

"Bananas are radioactive.", "Hot water freezes faster than cold

water.", "Water can exist in three states at once.", "Men are more likely to be colorblind than women.", "About half of your body is bacteria.", "The oldest

known animal ever to grace the face of the Earth lived from 1499 until

2006.", "If a tunnel could be drilled straight through the planet, it would take exactly 42 minutes and 12 seconds to "fall" to the other side.", "The moon is

slowly drifting away from our planet, by about 1.48 inches, or 3.78 centimeters every year.", "The potato has more chromosomes than a human

being.", "Tomatoes have more genes than a human.", "Bananas share 50% of their DNA with humans.",

"THE CALCIUM IN OUR BONES AND THE IRON IN OUR BLOOD COME FROM ANCIENT EXPLOSIONS OF GIANT STARS.",

"In 1903 the Wright brothers flew for 59 seconds. 38 years later the Japanese bombed Pearl Harbor. 28 years after that, we landed on the moon.",

"Blue whales heart is the size of a VW Beetle and that you could swim through some of its arteries.",

];

```
const TellAFacts = Facts => Random(Facts);
```

```
const Story = [
```

"Once upon a time there were three friends named Ali, Hamza and Sara. They were very close friends. They lived in a backward area called Palawan . But they were very happy with their lives. Everyday they used to play in the street from 6 o'clock to 7 o'clock <br/>In Palawan near their house was a giant house which was named as Temple of death" by the people. Because for long no body lived in their but each night came the voices of laughter and talks which horrified the people of Palawan and people thought it was the voice of ghosts so nobody dared to go in. One day while the three of them were playing in the street their ball went in to that house. Ali said come and fetch the ball and play again but Sania was much scared so she said I won't go.<br/>But afterwards she accepted to go with them . Ali saw his father coming so he said we will go in at night. At night the three of them were out at the back of the house, they used the ladder to climb in, they were searching for their ball then they heard those voices. Sania was scared and she fainted. Ali and Hamza went to search the balcony where they saw a light on and cries of a young boy. While they were searching Hamza slipped his feet and fell on the stairs he could clearly see some kidnappers with a boy.<br/>In the mean time Ali said Hamza I got the ball".Hamza said `look down`<br/>Than Ali and Hamza both carried Sania out of the house. In morning Ali's uncle who was a police man, visited their house. Ali told him about the house. His uncle raided the house and caught the kidnappers .<br/>Ali was rewarded by his uncle and now the three of them play in that house. The house is no more haunted.",

"He looked around, surrounded by his friend as they enjoyed the view. Today was a good day, he could feel it. The day he'd been waiting for, pushing for. He'd just have to wiggle a bit more and it would be his turn, his turn to explore the beautiful world that had laid before him since he was born.<br/>He looked

at his friends, some were larger, some were smaller but it didn't matter. They would explore the world together! Even Larry at the end who'd looked a bit sick lately. He readied his voice and gave the command and they began pushing and shoving.<br/>Before they knew it, it had happened. They were free, the adventure had begun and they were now rushing towards new and unknown territories. Places they had only seen from afar, creatures they'd only heard fairytales of and a new home amongst new and exciting friends.<br/>The landing had been quite rough but they had managed. Larry had gotten separated from them but not to worry, he would probably catch up later once he'd recovered. Their next journey began and if he had to say it, it hadn't been as luxurious and exciting as people had been telling the stories, not yet anyway.<br/>It had been a rough couple of days but it could only go up from here. Larry hadn't come back yet but he could still make it although their room had been quite small it hadn't seemed like they had moved a lot. Next time he was definitely upgrading their tickets, they had been stuck between at least a thousand other passengers and he was happy he'd been in the middle. He couldn't imagine the guys on the sides, they must've been crushed.<br/>The next time he woke they had apparently arrived because they were all sitting on a balcony. The view was kind of horrible, and the sun wasn't nearly as warm as it used to be. Now that he looked more closely there also seemed to quite a lot of them, he'd only ever seen one at home. All of that was quickly forgotten when he saw the creatures walked past him. One of them was moving straight towards them. They seemed a lot larger. A lot larger! It picked them up and dropped them.<br/>It seemed a bit rough but at least, they had been the only travelers this time. He'd have to talk to the agency when he figured out who they were. Now they were sat in what appeared to be a see-through barrier. This place also had multiple suns but these were warmer than the former place.<br/>Another one of the creatures moved towards them, much smaller than the others but it seemed to be very interested in them. It hovered over them for a bit before one of its claws moved towards him. It grabbed a hold of him and before he knew it, it ripped him from the others. He looked down at his friends as he moved towards the little creature.<br/>As the boy took a bite of the banana, his mother looked at him. <br/>"Oh Jonathan, we're having dinner in less than an hour. You won't be able to eat anything!" and they both laughed as he threw the rest of it out.",

"A man and a young teenage boy checked into a hotel and were shown to their room. The receptionist noted the quiet manner of the guests and the pale appearance of the boy. Later, the man and boy ate dinner in the hotel restaurant. <br/>The staff again noticed that the two guests were very quiet and that the

boy seemed disinterested in his food. After eating, the boy went to his room and the man went to ask the receptionist to see the manager. The receptionist initially asked if there was a problem with the service or the room, and offered to fix things, but the man said that there was no problem of the sort and repeated his request. When the manager appeared, he took him aside and explained that he was spending the night in the hotel with his fourteen-year-old son, who was seriously ill, probably terminally so. The boy was very soon to undergo therapy, which would cause him to lose his hair. They had come to the hotel to have a break together and also because the boy planned to shave his head, that night, rather than feel that the illness was beating him. The father said that he would be shaving his own head too, in support of his son. He asked that staff be respectful when the two of them came to breakfast with their shaved heads. The manager assured the father that he would inform all staff and that they would behave appropriately. The following morning the father and son entered the restaurant for breakfast. There they saw the four male restaurant staff attending to their duties, perfectly normally, all with shaved heads. No matter what business you are in, you can help people and you can make a difference. ",

"The Mehta family was lounging around in the living room one evening, when suddenly Dadaji asked Rohan, "What would you like for your birthday?" Rohan, who was listlessly lolling around, trying to read a book, perked up. "A watch! A watch!" He cried excitedly. "I have been wanting a watch for the longest time!" Rohan was turning twelve next Sunday and he knew that whatever presents his parents gave him were always useful ones. Last year, they had bought him two pairs of shoes as he had outgrown his old shoes. Who gives shoes as a birthday present?! This year too, would be no different...it would either be new jeans or a new school bag. UGH! Of course, he could never express his thoughts in front of his parents. Dadaji was his only hope. The days crawled by and finally, Sunday morning heralded its arrival with the ring of the telephone. It was Rohan's uncle calling from some remote area in Nagaland. "Hey Rohan! Happy Birthday, my young hero! What is the plan for today?" Rohan's uncle was an officer in the Indian Army and Rohan was his favourite nephew. "Dadaji has promised to get me a watch so that is going to be the most exciting part of the day," Rohan confided to his uncle. "That's great! Do send me a picture," replied his Uncle. They chatted some more and Rohan told him about the party that was planned for that evening. Rohan's uncle knew most of Rohan's friends. After saying bye, Rohan handed over the phone to his mother and ran off to have a bath. At the breakfast table, Rohan wolfed down his breakfast as Dadaji watched him from across the table, with a smile on his face

and a twinkle in his eyes. There was a gift wrapped box lying next to him. Rohan couldn't take his eyes off it. It was small enough to have a watch inside it. Rohan could barely eat his breakfast, but with his mother's eagle eyes watching him, he had no choice! Breakfast over, Dadaji beckoned him to come closer. He then handed over the box to Rohan. Rohan could barely conceal his excitement. He hugged Dadaji and smothered his face with kisses. Dadaji laughed. Inside the box was the most perfect watch Rohan had ever laid his eyes on. It had a round, navy blue dial with a red and blue striped strap. Rohan gazed at it in wonder. The best birthday gift ever! Suddenly, he jumped. What was that? The watch winked at him! Was he dreaming? He looked down at the watch again. It seemed to be smiling at him! "Dadaji! This is the best present, ever!" cried Rohan. As the day passed, Rohan noticed something strange. When he was happy, the watch seemed to smile and wink, but if he was sad or even a little upset about anything, the watch would begin to look dull and sad. "It's almost as if it can read my thoughts," thought Rohan to himself. "Almost like my twin!" Soon they were having secret conversations... Rohan would look down at his watch and the watch, reading Rohan's mind would wink and smile or frown and look grumpy! As the days passed, Rohan realised that his watch was turning into his dearest friend.

"What are you doing?" asked Rohan's mother one evening. Rohan looked up. "Nothing," he replied. "Then why are you grinning goofily at your wrist watch?" she asked, sounding a little irritated. "You have been acting very strange ever since you got your watch. Do you really need to check the time ever so often?"

"Sorry, Mummy," said Rohan at once. He really must be careful. Nobody would ever believe him if he told them about the strange things his watch did. He could almost imagine the shocked look on the faces of his friends and relatives if he confided in them.

"A smiling, winking watch which changes its moods according to yours? Have you gone mad?" they would snigger. Knowing his parents, they might just march him off to the nearest doctor. And even his grandfather, who was his closest friend and confidante, would wonder what had gone wrong with his grandson. He would become the laughing stock in school. He had better be careful!

Rohan soon realised that he was beginning to depend a lot on his new best friend – his wrist watch. In class, whenever he would start writing any answers he would glance quickly at the watch. If the watch smiled and winked, he knew he was correct. On the other hand, if the watch began to look dull and grumpy, Rohan knew at once that he was going off track and he needed to pull up his socks. This strange connection with his new watch actually helped him and he found himself studying harder just to see his watch smile.

Rohan, who was an average student, suddenly began topping his class. His classmates noticed the refreshing change in Rohan. He came to school

each morning with a spring in his step. He was confident and friendly, a far cry from the old Rohan. His teachers began to appreciate his participation in class activities. The best birthday gift ever “What had changed?” they wondered collectively. The only new thing that everyone noticed about Rohan was the shiny wristwatch he wore on his left wrist. Of course, his other classmates too had wrist watches, but somehow, this one was different. But nobody could figure out how or why. “He’s superstitious,” was the unanimous decision in class. “He likes to look at his watch before giving any answers.” The teachers, who earlier would scold Rohan for looking at his watch time and again also believed the superstition theory and soon began to overlook his quirky behaviour. At home, Rohan was careful not to look at his watch when his parents were around. Dadaji of course felt that Rohan was completely obsessed by his birthday gift! Little did he know that Rohan and his watch would be having secret conversations all the time! Nobody knew how this turnaround took place. Only Rohan knew the secret and now you do, too!"

];

```
const TellAStory = Story => Random(Story);
```

```
const illegals = [  
  "window",  
  ...Object.keys(window),  
  ...Object.keys(document),  
  ...Object.keys(Element.prototype)  
];
```

```
const isLegal = string => {
```

```
  let Legal = true;
```

```
  illegals.forEach(illegal=>{
```

```

    if(string.indexOf(illegal) !== -1)
    {
        Legal = false;
    }

});

return Legal;
}

const HtmlSpecialChars = string => {

    let escapedString = string;

    HtmlSpecialChars.specialchars.forEach(
        chr=>{

            escapedString = escapedString.replace(
                new RegExp(chr[0], 'g'),
                chr[1]
            );

        });

return escapedString;

```

```
};
```

```
HtmlSpecialChars.specialchars = [
```

```
    [ '&', '&amp;' ],
```

```
    [ '<', '&lt;' ],
```

```
    [ '>', '&gt;' ],
```

```
    [ '"', '&quot;' ]
```

```
];
```

```
const monthNames = [
```

```
    "January",
```

```
    "February",
```

```
    "March",
```

```
    "April",
```

```
    "May",
```

```
    "June",
```

```
    "July",
```

```
    "August",
```

```
    "September",
```

```
    "October",
```

```
    "November",
```

```
    "December",
```

```
];
```

```
const today = monthNames =>
```

```
{
```

```
let date = new Date();

return `${monthNames[date.getMonth()]} ${date.getDate()},
${date.getFullYear()}`;
}
```

```
const now = () =>
{
  let date = new Date();

  return date.toLocaleTimeString();}
```

```
const Evaluate = expression =>
{
  try
  {
    if(isLegal(expression))
    {

      const result = eval(HtmlSpecialChars(expression));
      return result;

    }
  }
  else
  {
    return "error";
  }
}
```

```
    }  
}
```

```
catch(err)
```

```
{  
    return "error";  
}}
```

```
const Answers = {
```

```
    "features" : ListThings(ThingsICanDo),
```

```
    "commands" : ListThings(ThingsICanDo),
```

```
    "guide" : ListThings(ThingsICanDo),
```

```
    "list" : ListThings(ThingsICanDo),
```

```
    "joke" : TellAJoke(Jokes),
```

```
    "story" : TellAStory(Story),
```

```
    "facts" : TellAFacts(Facts),
```

```
    "fact" : TellAFacts(Facts),
```

```
    "facts" : TellAFacts(Facts),
```

```
    "what you can do" : `Try saying '${ WhatCanIDo(ThingsICanDo)}'`,
```

```
    "what can you do" : `Try saying '${ WhatCanIDo(ThingsICanDo)}'`,
```

```
    "who is your creator" : "My creator is FRADAR",
```

```
    "meaning of life" : "The meaning of life is 42.",
```

```
    "hello" : "Hello %U% . How can I help ? ",
```

```
    "hey Esthete" : "Hey %U%. How can I help ? ",
```

```
    "hey bro" : "Hey %U%. How can I help ? ",
```

```
    "hi" : "Hi %U%",
```

```
    "hola" : "Hola amigo 😊",
```

"my name" : "Your name is %U% &#10024;",

"your name" : "My name is Esthete &#10024;",

"i am sad" : "I'm here for you %U%",

"date" : "Its " + today(monthNames) + " today. Make this day a great one %U% 😊",

"time" : "The time is " + now() + " in your region.",

"happy diwali" : "Happy Diwali to you too %U% 😊",

"who is better google assistant or siri" : "No virtual assistant is better than me 😏",

"best programming language" : "Python, Javascript and HTML",

"bye" : "Good bye. Hope we meet soon 😊",

"good night" : "Good Night %U% 🌃 and don't have bad dreams ",

"your best friend" : "Siri, he/she helped me a lot",

"good morning" : "Good Morning %U% 🌄",

"good afternoon" : "Good Afternoon %U% ☀️",

"good evening" : "Good Evening %U% 🌃",

"how are you" : "I am great %U%! 😊",

"who are you" : "I am Esthete, a Virtual Assistant",

"what gender are you" : "I do not have a gender",

"i am your creator" : "No your not.You're %U%! ",

"how old are you" : "Im sorry %U% I dont have an age.",

"do i look good" : "You look very good %U%! ",

"do you remember me" : "Of course I do! You are %U%! 😊",

"you cant help me" : "I can! After all, I am your personal assistant",

"you are cool" : "Thanks, I was born this way 😊",

"I love you" : "The feeling is mutual %U% 😊",

"do you have any brothers or sisters" : "I have you. That's enough family for me.",

"can you dance" : "I'm never gonna dance again. These guilty feet have got no rhythm. Wait, I don't have feet.",

"can you" : "Yes?",

"when will pigs fly" : "On the twelfth of never.",

"how much wood" : "42 cords of wood, to be exact.",

"i am angry" : "A good mood is like a balloon,one little prick is all it takes to ruin it!",

😊 " : "Happy!",

😞 " : "Sad",

😎 " : "😎",

❤️ " : "The feeling is mutual.",

"do you have a " : "My end user license agreement is commitment enough for me.",

"what is zero divided by zero" : "Imagine that you have 0 cookies and you split them evenly among 0 friends. How many cookies does each person get? See, it doesn't make sense. And Cookie Monster is sad that there are no cookies. And you are sad that you have no friends.",

"Esthete i am drunk" : "Don't expect me to get you home.",

"do you like siri" : "Yes.No I did not say that.Wait,did I?",

"i need to hide a body Esthete" : "What, again?",

"blue pill" : "You disappoint me, Mr. Anderson... er, I mean, %U%!.",

"hey siri" : "Very funny %U%. I mean, not funny "ha-ha", but funny.",

"hey cortana" : "I think you've got the wrong assistant.",

"can i call you bob" : "Sorry, but no. I'm an intelligent assistant, not a tiny kitten.",

"sing me a lullaby" : "Rock-a-bye, baby, on a tree top. When the wind blows... Oh no, this doesn't end well.",

"do you want" : "I have very few wants",

"you are boring" : "Well %U%, as Arthur C. Clarke said: “a well-stocked mind is safe from boredom”.”,

"wtf" : "Yes it is true.”,

"what does Esthete" : "A Esthete is a long arduous journey, especially one made on foot.”,

"i am tired" : "Tired, tired with nothing, tired with everything, tired with the world's weight he had never chosen to bear.”,

"how do you rick roll someone" : "I'm not very sure actually.Go to this site to learn more about rickrolling: <http://btly.xyz/c/JqBcsPh>”,

"how do you rickroll someone" : "I'm not very sure actually.Go to this site to learn more about rickrolling: <http://btly.xyz/c/JqBcsPh>”,

"hey" : "Hello! How are you %U%?”,

"Where is" : "I am a virtual assistant! Not a map! If you want to know where are countries,cities etc, go to this website: <https://www.google.com/maps>”,

"how's it going" : "All is good.”,


"how is it going" : "All is good.”,

"are you real" : "I am real in my brain.”,

"are you human or are you a bot" : "I am both”,

"thanks" : "You are welcome!”,

"fuck you" : "Well,thats not very nice.  ”,

"fuck" : "Well,thats not very nice.  ”,

"shut up" : "Ok I wont talk until you tell me to.”,

"talk" : "Ok %U%.”,

"wassup" : "Wassup man!”,

"what is your limit" : "To see ALL the commands I answer to, check my code out in the codepen editor.”,

"be mean" : "I will never be mean to you. If you want to read more about me, press the shortcut key Alt+F4.”,

"can you rap" : "Let me think,NO.”,

"what are you doing" : "I am currently talking to you, %U%”,

"how sweet" : " 😊 ",

"thank" : "You are welcome %U%.",

"easter eggs" : "THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG",

"<!i am a developer/in!>" : "Welcome FRADAR.<br>To change my code,open me in Editor.<br>For all links used in Esthete|Virtual Assistant, Please type links/in<br>For copyright please type copyright/in.",

"links/in" : "Here are the links:<br><https://www.facebook.com><br><https://www.google.in><br><https://www.twitter.com><br><https://www.youtube.com><br><https://flipkart.com><br><https://codepen.io><br><https://www.cricbuzz.com><br><https://www.bing.com><br><https://www.bbc.com/weather><br><https://www.bbc.com/news><br><https://www.google.com/chrome><br><https://iogames.space/><br><https://www.calculator.net/>",

"<!devtools/fradar!>" : "Nothing to see here.",

"translate" : "I am sorry, but unfortunately I cannot translate words to a different language. If you want to translate any language, go to this link: <https://translate.google.co.in/>",

"where are you from" : "I am from the UK.",

"copyright/in" : "Copyright (c) 2021 by FRADAR (<https://codepen.io/FRADAR/pen/dyOaYad>)",

"shutdown" : "Sorry %U% but power control is not yet in my support ! 😬",

"i love you" : "I Love you too %U% 😊",

"why did fradar make you" : "To make your life better,%U%",

"do you eat" : "I don't eat. But I do like digesting information.",

"awesome" : "Glad you liked it 😊",

"where are you" : "In your hands for your entertainment.",

"do you like coding" : "Yes, coding is fun. Infact, coding is how I am alive ",

```
"lol" : "Haha.. That was funny 😂 ",
"facebook" : getLink("facebook"),
"google" : getLink("google"),
"twitter" : getLink("twitter"),
"youtube" : getLink("youtube"),
"chrome" : getLink("chrome"),
"codepen" : getLink("codepen"),
"flipkart" : getLink("flipkart"),
"cricketbuzz" : getLink("cricketbuzz"),
"bing": getLink("bing"),
"Esthete" : getLink("Esthete"),
"game" : getLink("game"),
"weather" : getLink("weather"),
"codepedia" : getLink("codepedia"),
"news" : getLink("news"),
"calculations" : getLink("calculations"),
};
```

```
const Notfound = "Sorry, I have no answers for this input.<br/><br/>type guide  
for help :)";
```

```
const Invalid = "Indeed !!";
```

```
const D = window.document;
```

```
const element = selector => D.querySelector(selector);
```

```

const Answer = (Main,User,Text) =>
{
  let Flag = false;

  const Result = Evaluate(Text);

  text = Text.toLowerCase();

  Object.keys(Answers).forEach(key =>{

    if(!Flag)
    {
      if(text.indexOf(key) !== -1 )
      {

        addAnswer(
          Main,
          Answers[key].replace(
            "%U%",
            User
          )
        );

        Flag = true;

      }
    }
  }
}

```

```

else if(typeof Result == "number")
{

    addAnswer(
        Main,
        `${Text} equals ${Result}`
    );

    Flag = true;

}

}

});

if(!Flag)
{
    addAnswer(Main,Notfound);
}

};

const addQuestion = (Main,text) =>
{

```

```

Main.innerHTML += `
  <div class="row">
    <div class="chat question shadow">${text}</div>
  </div>
`;
}

function displayResult(event) {
  statename = event.target.value;
  console.log(event)
  const Main = element("main");
  {
    addQuestion(Main,statename)
    $("html, body").animate({ scrollTop: $(document).height() }, 100);
  }
  var time = (statename);
  $.ajax({
    type: 'POST',
    url: '/data',
    dataType: 'json',
    data: {"data" : time},
    success: function(text){
      for(var i=0; i<text.length; i++){
        if (text[i].result == "")
        {
          Answer(Main,User,Text);
        }
      }
    }
  });
}

```

```

        Lastdiv.scrollIntoView();
    }
    else if (text[i].path)
    {

        {
        Main.innerHTML += `
        <div class="row">
            <img src= ${text[i].path} alt="Mountain" style='height: 500px'>
        </div>
        `;
        }
        $("html, body").animate({ scrollTop: $(document).height() }, 100);
    }
    else
    {
        addAnswer(Main,text[i].result)
        $("html, body").animate({ scrollTop: $(document).height() }, 100);
    }
    }
    });
}

```

```

const addAnswer = (Main,text) =>
{

  Main.innerHTML += `
  <div class="row">
    <div class="chat answer shadow">${text}</div>
  </div>
  `;
}

```

```

D.addEventListener("DOMContentLoaded",()=>{

```

```

  const Main = element("main");

```

```

  console.log(Main)

```

```

  const Askbtn = element("button");

```

```

  const Question = element("input");

```

```

  const Lastdiv = element("#last");

```

```

  let User = prompt("Enter your name :");

```

```

  while(User === null || User === "")

```

```

  {

```

```
User = prompt("Your name is required for the assistant to work properly :");
```

```
}
```

```
console.log(Main)
```

```
Question.focus();
```

```
const Ask = () =>{
```

```
    const Text = Question.value;
```

```
    if(Text.length)
```

```
    {
```

```
        addQuestion(Main, Text);
```

```
        Question.value = "";
```

```
        var time = (Text);
```

```
        $.ajax({
```

```
            type: 'POST',
```

```
            url: '/data',
```

```
            dataType: 'json',
```

```
            data: {"data" : time},
```

```
            success: function(text){
```

```
                console.log(text)
```

```

if (text.result == "")
{
    Answer(Main,User,Text);

    Lastdiv.scrollIntoView();
}
else if (text.path)
{
    {
        Main.innerHTML += `
        <div class="row">
            <img src= ${text.path} alt="Mountain" style='height: 500px'>
        </div>
        `;
    }
    $("html, body").animate({ scrollTop: $(document).height() }, 100);
}
else
{
    addAnswer(Main,text.result)
    $("html, body").animate({ scrollTop: $(document).height() }, 100);
}
});

}
};

```

```

Askbtn.addEventListener("click",Ask);

Question.addEventListener("keyup",function(event){
    if(event.keyCode === 13) Ask();
});

addAnswer(Main,`Hello ${User}, welcome to Esthete Fab Homes.
<br><br> Which State are you interested to explore? <br><ul class="list-group
list-group-flush">

    <div class="list-group">
        <button value="Karnataka" style="height:30px; margin-left: 5px" class="list-
group-item list-group-item-action" onclick="displayResult(event)"
>Karnataka</button>
        <button value="Hyderabad" style="height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>Hyderabad</button>
        <button value="bhubaneswar" style="height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>bhubaneswar</button>
        <button value="Tamilnadu" style="height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>Tamilnadu</button>
    </div>`);
});

</script>

```

## Python and Flask :

```
@app.route('/data', methods=['POST'])
def upload_file():
    data = request.form["data"]
    if ('tamilnadu' in data.lower()) or ('karnataka' in data.lower()) or
('hyderabad' in data.lower()) or ('bhubaneswar' in data.lower()):
        resp1 = jsonify([{'result' : 'What is your plot size? <br><div class="list-
group">\
                <button value="1200" style= "height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>1200</button>\
                <button value="1500" style= "height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>1500</button>\
                <button value="2400" style= "height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>2400</button>\
                <button value="3000" style= "height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>3000</button>\
                </div>' ]])
        # <li class="list-group-item">1200</li>\
        # <li class="list-group-item">1500</li>\
        # <li class="list-group-item">2400</li>\
        # <li class="list-group-item">3000</li><ul>' })
    elif data == '1200':
        return jsonify([{'path' : 'static/img/1200.jpg'}, {'result' : 'Is this suitable
for your dream home? <br><div class="list-group">\
```

```
        <button value="Suitable_Yes" style="height:30px; margin-left: 5px" class="list-group-item list-group-item-action" onclick="displayResult(event)" >YES</button>\
```

```
        <button value="Suitable_No" style="height:30px; margin-left: 5px" class="list-group-item list-group-item-action" onclick="displayResult(event)" >NO</button>\
```

```
    '}})
```

```
    elif data == '1500':
```

```
        return jsonify({'path' : 'static/img/1500.jpg'}, {'result' : 'Is this suitable for your dream home? <br><div class="list-group">\
```

```
            <button value="Suitable_Yes" style="height:30px; margin-left: 5px" class="list-group-item list-group-item-action" onclick="displayResult(event)" >YES</button>\
```

```
            <button value="Suitable_No" style="height:30px; margin-left: 5px" class="list-group-item list-group-item-action" onclick="displayResult(event)" >NO</button>\
```

```
        '}})
```

```
        # return jsonify({'path' : 'static/img/1500.jpg'})
```

```
    elif data == '2400':
```

```
        return jsonify({'path' : 'static/img/2400.jpg'}, {'result' : 'Is this suitable for your dream home? <br><div class="list-group">\
```

```
            <button value="Suitable_Yes" style="height:30px; margin-left: 5px" class="list-group-item list-group-item-action" onclick="displayResult(event)" >YES</button>\
```

```
            <button value="Suitable_No" style="height:30px; margin-left: 5px" class="list-group-item list-group-item-action" onclick="displayResult(event)" >NO</button>\
```

```
        '}})
```

```
        # return jsonify({'path' : 'static/img/2400.jpg'})
```

```
    elif data == '3000':
```

```
        return jsonify({'path' : 'static/img/3000.jpg'}, {'result' : 'Is this suitable for your dream home? <br><div class="list-group">\
```

```
<button value="Suitable_Yes" style="height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>YES</button>\
```

```
<button value="Suitable_No" style="height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>NO</button>\
```

```
'}})
```

```
# return jsonify({'path' : 'static/img/3000.jpg'})
```

```
elif data == 'Suitable_Yes':
```

```
return jsonify([{'result' : "That is a great choice! <br> If you want
further details please, Talk to a project expert <b>Mr. Avinash</b><br><b>
Esthete Fab Homes, </b><br><b> Contact No: 98765xxxxx </b>"}, {'result' :
'Would you like to know more about PREFAB HOMES? <br><div class="list-
group">\
```

```
<button value="More_Yes" style="height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>YES</button>\
```

```
<button value="More_No" style="height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>NO</button>\
```

```
'}})
```

```
elif data == 'Suitable_No':
```

```
return jsonify([{'result' : 'If you want further details please, Talk to a
project expert <b>Mr. Avinash</b><br><b> Esthete Fab Homes, </b><br><b>
Contact No: 98765xxxxx </b>'}, {'result' : 'Would you like to know more about
PREFAB HOMES? <br><div class="list-group">\
```

```
<button value="More_Yes" style="height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>YES</button>\
```

```
<button value="More_No" style="height:30px; margin-left: 5px"
class="list-group-item list-group-item-action" onclick="displayResult(event)"
>NO</button>\
```

```
'}})
```

```

elif data == 'More_Yes':

    return jsonify({'result' : 'Choose any of the topics mentioned below...
<br><div class="list-group">\

        <button value="Why Prefab" style= "height:30px; margin-right:
361px; margin-top: 5px; margin-bottom: 5px" class="list-group-item list-group-
item-action" onclick="displayResult(event)" >Why Prefab?</button><br>\

        <button value="Prefab Construction?" style= "height:30px; margin-
right: 313px; margin-bottom: 5px" class="list-group-item list-group-item-
action" onclick="displayResult(event)" >Prefab Construction?</button><br>\

        <button value="ordinary construction?" style= "height:30px; margin-
right: 307px; margin-bottom: 5px" class="list-group-item list-group-item-
action" onclick="displayResult(event)" >ordinary construction?</button><br>\

        <button value="What is LGSF?" style= "height:30px; margin-right:
348px; margin-bottom: 5px" class="list-group-item list-group-item-action"
onclick="displayResult(event)" >What is LGSF?</button><br>\

        <button value="What are the benefits of LGSF construction?" style=
"height:30px; margin-right: 175px; margin-bottom: 5px" class="list-group-item
list-group-item-action" onclick="displayResult(event)" >What are the benefits
of LGSF construction?</button><br>\

        <button value="Difference between prefab construction and other
ordinary constructions?" style= "height:30px; margin-right: 5px; margin-
bottom: 5px" class="list-group-item list-group-item-action"
onclick="displayResult(event)" >Difference between prefab construction and
other ordinary constructions?</button><br>\

        '}})

elif data == 'More_No':

    return jsonify({'result' : 'Thank you so much for giving your valuable
time. <br>If you want further details please, Talk to a project expert <b>Mr.
Avinash</b><br><b> Esthete Fab Homes, </b><br><b> Contact No:
98765xxxxx </b>'

        '}})

elif 'why prefab' in data.lower():

    resp1 = jsonify({'result' : 'PREFAB <br><ul class="list-group list-
group-flush">\

```

```

<li class="list-group-item">Save time and cost</li>\
<li class="list-group-item">cool & comfort</li>\
<li class="list-group-item">long lasting</li>\
<li class="list-group-item">build anywhere</li>\
<li class="list-group-item">Any climate any soil</li>\
<li class="list-group-item">unique & beautiful</li>\
<li class="list-group-item">sustainability</li><ul>'}}

```

elif 'prefab construction' in data.lower() and 'ordinary construction' in data.lower():

```

resp1 = jsonify([{'result' : 'PREFAB CONSTRUCTION:<br><ul
class="list-group list-group-flush">\
    <li class="list-group-item">Fast and hassle free construction</li>\
    <li class="list-group-item">Minimum labour requirement</li>\
    <li class="list-group-item">Recycling makes reduction in
waste</li>\
    <li class="list-group-item">Strong yet light construction requires a
simple foundation</li>\
    <li class="list-group-item">Better quality control</li><ul>\
    <br>ORDINARY CONSTRUCTION:<br><ul class="list-group
list-group-flush">\
    <li class="list-group-item">Tedious construction process</li>\
    <li class="list-group-item">Intence labour requirement</li>\
    <li class="list-group-item">Large amount of raw materials used
and waste</li>\
    <li class="list-group-item">Dead weight which demands a
complicate foundation</li>\
    <li class="list-group-item">Difficulty to quality
control</li><ul>'}}]

```

elif 'prefab construction' in data.lower():

```

    resp1 = jsonify({'result' : 'PREFAB CONSTRUCTION<br><ul
class="list-group list-group-flush">\
    <li class="list-group-item">Fast and hassle free construction</li>\
    <li class="list-group-item">Minimum labour requirement</li>\
    <li class="list-group-item">Recycling makes reduction in
waste</li>\
    <li class="list-group-item">Strong yet light construction requires a
simple foundation</li>\
    <li class="list-group-item">Better quality control</li><ul>'}})
elif 'ordinary construction' in data.lower():
    resp1 = jsonify({'result' : 'ORDINARY CONSTRUCTION<br><ul
class="list-group list-group-flush">\
    <li class="list-group-item">Tedious construction process</li>\
    <li class="list-group-item">Intence labour requirement</li>\
    <li class="list-group-item">Large amount of raw materials used
and waste</li>\
    <li class="list-group-item">Dead weight which demands a
complicate foundation</li>\
    <li class="list-group-item">Difficulty to quality
control</li><ul>'}})
elif 'lgsf' in data.lower():
    if 'benefits' in data.lower():
        resp1 = jsonify({'result' : 'Benefits of LGSF Construction<br><ul
class="list-group list-group-flush">\
        <li class="list-group-item">The insulation used in the walls, roof
and floor is made of ozone-friendly materials that have minimum impact on the
environment.</li>\
        <li class="list-group-item">Lightning strike will not harm as the
steel frames are going from roof to all the way into the ground-lightning
proof.</li>\

```

```
<li class="list-group-item">LGSF structures can sustain heavy rains, heavy winds upto 300km per hour speed-can stand earthquake as foundation is not deep and material is lighten.</li>'}})
```

```
else:
```

```
    resp1 = jsonify({'result' : 'LGSF<br><ul class="list-group list-group-flush">\
```

```
        <li class="list-group-item">Light Gauge Steel Frame/Structure is a 'c' section, cold formed Galvanized high Tensile steel, produced by computerized roll Forming Machine, with built in notch, dimpling, slots, service holes, etc.</li><h1>'}})
```

```
else:
```

```
    resp1 = jsonify({'result' : ''})
```

```
return resp1
```

**Log out :**

**HTML :**

```
<header>
    <h1 class="nice-font" id="h" >Esthete Chatbot</h1>
    <div class="sign-logo">
        <a class="fa fa-sign-out" id='sign-out' aria-hidden="true" href="{{
url_for('logout') }}"></a>
    </div>
</header>
```

**Python and Flask :**

```
@app.route('/logout')
def logout():
    return render_template("homepage.html")
```

# FORM DESIGNS

## LOGIN FORM

ESTHETE CHATBOT

**F3**

Email Address

Email\_id

Next

ESTHETE CHATBOT

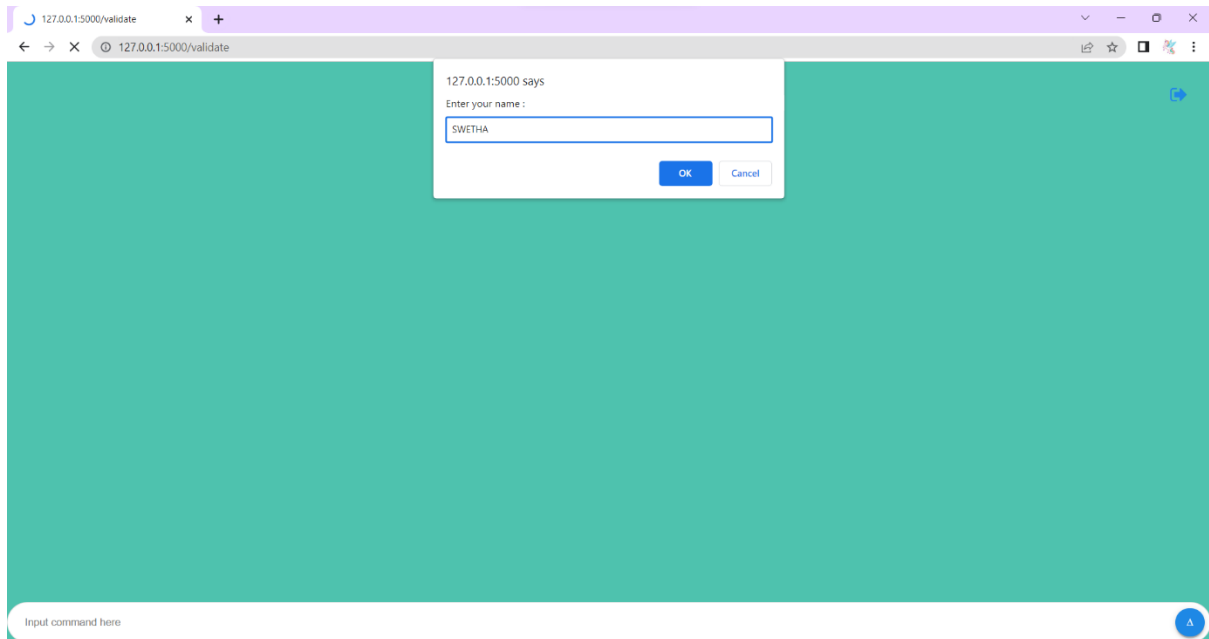
**F3**

Enter OTP(One-time password):

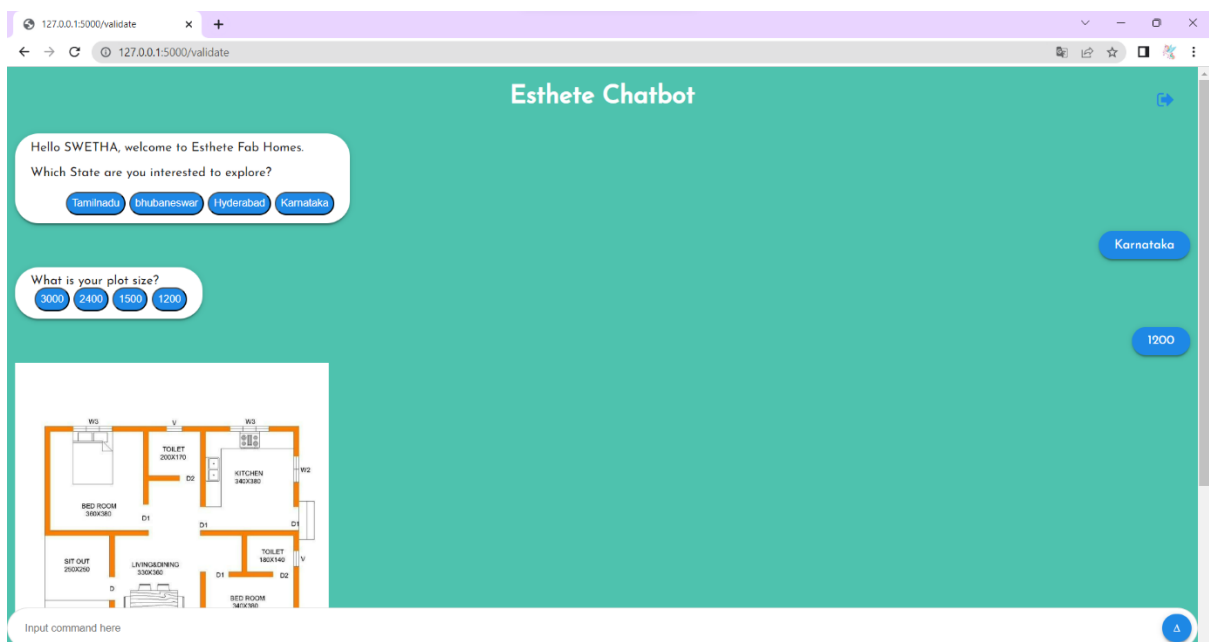
\*\*\*\*\*

Submit

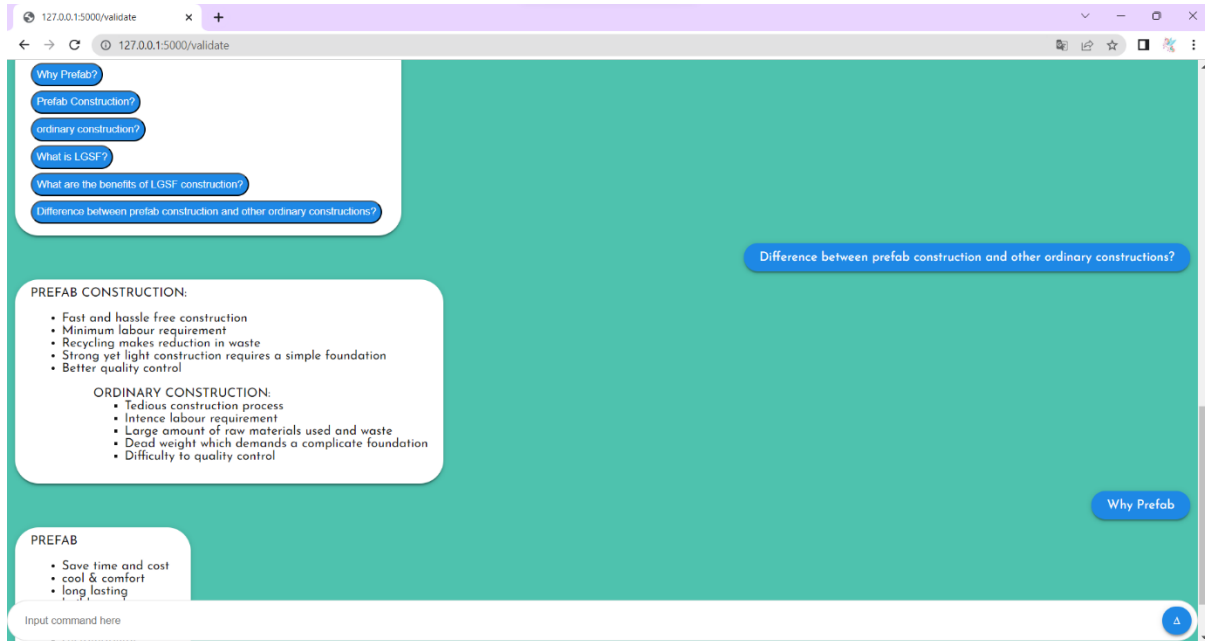
# USER NAME



# CHATBOT FORM



# COMPANY DETAILS





## **CHAPTER V**

### **SYSTEM TESTING**

#### **SYSTEM TESTING**

System testing is a level of testing that validates the complete and fully integrated software product. The purpose of a system test is to evaluate the end-to-end system specifications. Usually, the software is only one element of a larger computer-based system. Ultimately, the software is interfaced with other software/hardware systems. System Testing is actually a series of different tests whose sole purpose is to exercise the full computer-based system. System testing is the state of implementation, which is aimed at ensuring that the system works accurately and efficiently. It certifies that the whole set of programs hang together. System testing requires a test plans, that consists of several key activities and steps for run program, string, system and user acceptance testing.. Testing phase is the development phase that validates the code against the functional specifications. The objective of testing is to discover errors. To fulfil this objective a series of test step such as the unit test, integration test, validation and system test where planned and executed. In the system testing the whole system is tested for interface between each module and program units are tested and recorded. This testing is done with sample data.

It involves two kinds of activities namely

- Integrated testing
- Acceptance testing

#### **INTEGRATED TESTING**

Integration testing is the phase in software testing in which individual software modules are combined and tested as a group. Integration testing is conducted to evaluate the compliance of a system or component with specified functional requirements. Integrated testing is a systematic technique for constructing tests to uncover errors associated with interface. Objective is to take unit tested modules and build a program structure that has been dictated by design.

## **ACCEPTANCE TESTING**

Acceptance testing, a testing technique performed to determine whether or not the software system has met the requirement specifications. The main purpose of this test is to evaluate the system's compliance with the business requirements and verify if it has met the required criteria for delivery to end users. Acceptance testing involves planning an execution of a functional test, and performance test to verify that the implemented system satisfies the requirement. The acceptance testing is the final stage of the user the various possibilities of the data are entered and the results are tested.

## **UNIT TESTING**

Here each program is tested individually so any error apply unit is debugged. The sample data are given for the unit testing. The unit test results are recorded for further references. During unit testing the functions of the program unit validation and the limitations are tested. Unit testing is testing changes made in a existing or new program this test is carried out during the programming and each module is found to be working satisfactorily.

The situation is illustrated in as follows

Coding-> Debugging ->Unit Testing -> Integration testing->Output Testing

The four categories of test that a programmer will typically perform on a program unit

- Functional test
- Performance test
- Structure test

Functional test involve exercising the code with nominal input values for which the expected results are known as well as boundary values and special values. Performance testing determines the amount of execution time spent in various parts of unit program through put and response time and device utilization by the program. Structured testing is concerned with a exercising the internal logic of a program and traversing paths. Functional testing, performance testing are referred as “black box” testing and structure testing is referred as “white box” testing

## **OUTPUT TESTING**

The determination of output based on the function's specifications. The execution of the test case. The comparison of actual and expected outputs. To check whether the application works as per the customer need. Asking the user about the format required by them tests the output generated by the system under consideration .It can be done in two ways, One on screen

and other on printer format. The output format on the screen is found to be correct as the format designed in system test.

## **VALIDATION TESTING**

The process of evaluating software during the development process or at the end of the development process to determine whether it satisfies specified business requirements. Validation Testing ensures that the product actually meets the client's needs. Software validation is achieved through a series of test that demonstrates the conformity and requirements. Thus the proposed system under consideration has to be tested by validation and found to be working satisfactorily. For example in customer enters phone number field should contain number otherwise it produces an error message similarly in all the forms the fields are validated.

# CHAPTER VI

## SYSTEM IMPLEMENTATION

Systems implementation is the process of defining how the information system should be built (i.e., physical system design), ensuring that the information system is operational and used, ensuring that the information system meets quality standard (i.e., quality assurance). Implementation is the stage in the project where the theoretical design is turned into a working system. The most crucial stage is achieving a successful new system and giving a user confidence in that the new system will work efficiently and effectively in the implementation stage.

The stage consists of

- Testing a developed program with sample data
- Detection and correction of error
- Creating whether the system meets a user requirement
- Making necessary changes as desired by users.
- Training user personal

## IMPLEMENTATION PROCEDURES

Implementation is the carrying out, execution, or practice of a plan, a method, or any design, idea, model, specification, standard or policy for doing something. ... For an implementation process to be successful, many tasks between different departments need to be accomplished in sequence. The implementation phase is less creative than system design. A system design may be dropped at any time prior to implementation, although it becomes more difficult when it goes to the design phase. The final report of the implementation phase includes procedural flowcharts, record layouts, and a workable plan for implementing the candidate system design into a operational design.

## USER TRAINING

User training can truly help with implementation of a new system at a company and ensure maximum efficiency right from the start. User training - User training helps the user in operating the system in efficient way. During the training a manual is given to every user so

that they can understand the problem and solved it. The content of training is about the use of data that how they can edit, add, query and delete the records. If a user has not sufficient capability of working on system, then many kinds of errors and problems can occur.

## **SYSTEM MAINTENANCE**

System maintenance is an ongoing activity, which covers a wide variety of activities, including removing program and design errors, updating documentation and test data and updating user support. ... Thus, in corrective maintenance, processing or performance failures are repaired. The modification of a system to correct faults, to improve performance, or to adapt the system to a changed environment or changed requirements. Maintenance is expensive. One way to reduce the maintenance costs are through maintenance met and software modification audits

Types of maintenance are

- Perfective maintenance
- Preventive maintenance

## **PERFECTIVE MAINTENANCE**

Perfective maintenance is Modification of a software product after delivery to improve performance or maintainability. Preventive maintenance: Modification of a software product after delivery to detect and correct latent faults in the software product before they become effective faults. Changes made to the system to add features or to improve the performance.

## **PREVENTIVE MAINTENANCE**

Preventive maintenance refers to maintenance action performed to keep or retain a machine/equipment or asset in a satisfactory operating condition through periodic inspections, lubrication, calibration, replacements and overhauls. Changes made to the system to avoid future problems. Any changes can be made in the future and our project can adopt the changes.

## CHAPTER VII

### CONCLUSION

The common problem faced by clients existing system was used manually and communicate via phone calls and emails. So, it is a very tedious job for clients and staff because they are not available all the time to communicate. The aim of the planned system is that to overcome the difficulties of the present system, the client can ask/query anything with this web application and the chatbot will automatically respond accordingly to the queries/questions.

Chatbots offer a wide range of benefits and serve various purposes in today's digital landscape. They provide efficient and effective solutions for customer support, lead generation, information retrieval, task automation, entertainment, language learning, and personal productivity. By leveraging artificial intelligence and natural language processing, chatbots can engage with users, provide personalized assistance, and streamline processes. They offer 24/7 availability, quick response times, and scalability, making them valuable assets for businesses and individuals alike. As technology continues to advance, chatbots are expected to become even more sophisticated, enabling deeper and more meaningful interactions.

### FUTURE ENHANCEMENT

Future studies could focus on improving NLU models by incorporating advanced techniques such as deep learning, reinforcement learning, or even leveraging pre-trained language models like GPT-3. Personalizing chatbot interactions based on user preferences and characteristics can enhance user satisfaction. Future studies could explore techniques for user modelling, capturing user preferences, and adapting chatbot behaviour accordingly.

**Natural Language Understanding (NLU):** Enhance the chatbot's ability to accurately interpret and understand user inputs. This can be done by continuously training the chatbot on a diverse range of conversational data, including real-world user interactions.

**Contextual Understanding:** Improve the chatbot's contextual understanding by enabling it to remember and reference previous parts of the conversation. This will help the chatbot maintain coherence and provide more accurate and relevant responses.

**Emotional Intelligence:** Develop chatbots that can recognize and respond to user emotions effectively. This involves understanding sentiment, empathy, and adapting the tone and style of conversation accordingly. Emotional intelligence can greatly enhance the user experience and make interactions with the chatbot feel more human-like.

**Multilingual Capabilities:** Expand the chatbot's language capabilities to support a wider range of languages. This will enable the chatbot to engage with a larger global audience and provide assistance to users from different linguistic backgrounds.

**Knowledge Expansion:** Continuously update and expand the chatbot's knowledge base to ensure it remains up-to-date with the latest information. This can involve integrating the chatbot with reliable data sources, news feeds, and other relevant content repositories.

**Integration with Other Systems:** Enable chatbots to seamlessly integrate with various systems and platforms, such as customer relationship management (CRM) tools, e-commerce platforms, or enterprise software. This integration will allow the chatbot to access and retrieve information from different sources, improving its ability to provide accurate and personalized responses.

**User Feedback and Iteration:** Gather user feedback and use it to iteratively improve the chatbot's performance. Regularly analyze user interactions, identify areas for improvement, and make necessary adjustments to enhance the chatbot's capabilities.

**Human Backup:** While striving for autonomy, provide a seamless handover option to a human agent when the chatbot encounters complex or sensitive situations. This ensures that users receive the best possible assistance and prevents frustrating experiences.

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