Batch:-B-2 **Roll No:**-16010122151

Exp No: 3

Title: Prepare the Design document of mini project. (Design Phase).

Objective: To prepare a design document for implementation of mini project after appropriate analysis of gathered requirement.

Expected Outcome of Experiment:

Course Outcome	After successful completion of the course students should be able to
CO 3	Describe the design in the form of algorithm/flowchart/block diagram.

Books/ Journals/ Websites referred:

1. Stanford Encyclopaedia of Philosophy (https://plato.stanford.edu)
2. GitHub (https://github.com)
3. Wikipedia (https://www.wikipedia.org)

Title of Mini Project:- LawGuide

Team Members:-

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"Students are required to prepare design document in the format given below, please replace the words shown in yellow background of the template."

1. System Design

#1 This section should briefly introduce the system context and design, and discuss the background to the project. This section may refer to feasibility studies and prototyping exercises

LawGuide is a user-friendly legal research and guidance system designed to provide easy access to a wide array of legal information. Developed to meet the growing demand for efficient legal research tools, LawGuide leverages advancements in technology, such as artificial intelligence and natural language processing, to streamline the process of finding relevant legal documents, case law, statutes, and regulations. Feasibility studies and prototyping exercises were integral to shaping LawGuide's design and functionality, ensuring it meets the needs of both legal professionals and individuals seeking legal assistance. Overall, LawGuide aims to democratize access to legal information and empower users to navigate the complexities of the legal system more efficiently.

#2 The description of the system should be given in terms of the Architecture of the solution that is being implemented.

LawGuide utilizes the BotPress architecture, comprising modular components that function independently. Data is stored in repositories such as databases and data lakes, with efficient indexing for rapid retrieval. Machine learning algorithms analyze legal texts, yielding valuable insights. The user interface, accessible via web and mobile, offers advanced search and visualization tools. Stringent security measures ensure data protection and compliance. This architecture ensures a smooth legal research experience, empowering users to navigate the legal landscape with ease.

1.1 System Architecture

#1 This section should describe the Architecture of the system, based on requirement analysis document.

The system architecture of LawGuide, based on the requirement analysis document, is structured around BotPress, ensuring efficient delivery of legal information. Here are its key components:

- **Data Layer:-** Stores legal documents with fast retrieval mechanisms.
- **Processing Layer:-** Utilizes NLP and machine learning for analysis and insights.
- **Service Layer:-** Employs microservices for various functionalities, interacting within BotPress.
- **User Interface Layer:-** Provides intuitive interfaces for user interaction.
- **Security Layer:-** Implements measures for data protection and compliance.
- **Infrastructure Layer:-** Supports system operations with scalable infrastructure.

#2 The system architecture diagram should depict overall relationship between the modules in the project which show various functionality of the system.

(System Block diagram showing input, processing, output block/s)

The system architecture diagram illustrates the overall relationship between the modules in the project, showcasing the various functionalities of the system. It follows a typical input-processing-output model, where data flows through distinct stages:

1. **Input Block:-** This block represents the entry point of data into the system. It encompasses various sources of input, such as user input, external data sources, and system events. Inputs may include legal documents, user queries, and metadata.
2. **Processing Block:-** This block represents the core processing capabilities of the system. It encompasses modules responsible for analyzing, transforming, and manipulating the input data to generate meaningful outputs. Processing tasks may include data analysis, natural language processing, machine learning, and data enrichment.
3. **Output Block:-** This block represents the endpoint of data processing, where the results are presented to the user or consumed by other systems. It encompasses modules responsible for generating output in various formats, such as text, visualizations, recommendations, and alerts. Outputs may include search results, summarized insights, personalized recommendations, and notifications.

The relationships between these blocks illustrate the flow of data through the system, from input to processing to output. Each block interacts with others to facilitate the overall functionality of the system. The architecture diagram provides a high-level overview of how the system components work together to fulfill its objectives, enabling users to efficiently navigate the legal landscape and access relevant information.

1.2 Module wise flow diagram

#1 Each module in the system should be showing the detailed functional flow with appropriate description. (show use cases)

- **User Interface Module:-**
  - Users log in or access the LawGuide platform.
  - Users interact with the interface to search for legal documents, view recommendations, or access saved documents.
  - User input is processed and passed to the appropriate service modules.

- **Search Module:-**
  - Users enter search queries or select predefined filters.
  - The module retrieves relevant documents from the data layer based on the query.
  - Search results are displayed to the user in the interface.

- **Recommendation Module:-**
  - Users interact with the system, indicating preferences or interests.
  - The module analyzes user behavior and preferences.
  - Personalized recommendations are generated and displayed to the user.

- **Document Processing Module:-**
  - Legal documents are ingested into the system.
  - Metadata, keywords, and other relevant information are extracted from the documents.
  - Processed documents are indexed and stored in the data layer for retrieval.

- **Authentication and Authorization Module:-**
  - Users attempt to access the system or perform restricted actions.
  - The authentication module verifies user credentials.
  - The authorization module checks user permissions to determine access rights.

Each module contributes to the functionality and usability of the LawGuide system, enabling users to efficiently navigate the legal landscape and access relevant information.

1.3 Software development tools

#1 This section should list the tools chosen to assist software development, including testing. The actual software chosen will be heavily dependent upon the language in which the system will be implemented.

#2 The list may include:

a. an application development tool;

BotPress

b. HTML authoring tools;

VSCODE

c. a word processor for documentation;

Google Docs

d. a tool for drawing diagrams;

DIA

e. Automated testing tools.

BotPress

Post Lab Activities:

1. Design document is a very important in software development life cycle. Comment on the above statement.

ANS) The statement is indeed accurate. A design document serves as a blueprint for the entire software development lifecycle, guiding the development team through the process of building a software product or system. Here are a few reasons why design documents are crucial:-

1. **Clarity and Understanding:-** Design documents provide a clear understanding of the project's requirements, goals, and architecture to all stakeholders involved, including developers, testers, project managers, and clients. This ensures everyone is on the same page regarding what needs to be built and how it will be achieved.

2. **Guidance for Development:-** Design documents outline the overall structure of the software, including its modules, components, interfaces, and interactions. This guidance helps developers to write code efficiently, reducing the risk of errors and ensuring consistency across the system**.**

3. **Risk Mitigation:-** By thoroughly documenting the design decisions and rationale behind them, design documents help identify potential risks and challenges early in the development process. This allows teams to address issues proactively, minimizing the likelihood of costly rework or project delays later on.

4. **Communication and Collaboration:-** Design documents facilitate communication and collaboration among team members by providing a centralized reference point for discussions and decision-making. They enable

developers to work collaboratively towards a common goal, fostering a shared understanding of the project's scope and requirements.

5. **Documentation and Maintenance:-** Design documents serve as valuable documentation for the software product, aiding in its maintenance and future enhancements. They provide insights into the system's architecture and design principles, making it easier for new team members to onboard and for existing team members to make updates or modifications as needed.

Overall, design documents play a vital role in the software development lifecycle by providing a structured approach to planning, designing, and implementing software solutions, ultimately contributing to the success of the project.