College Enquiry Chatbot – A Deep Learning Based FAQ System

1. Team Details:-

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2. Introduction :-

2.1 Purpose :

The main purpose of this project is to build an AI-powered chatbot that can efficiently respond to commonly asked questions related to college information. The chatbot will help automate basic inquiries, saving time and effort for administrative staff and providing students with instant answers.

2.2 Scope :

This chatbot will function as a virtual assistant for college-related queries. It will be developed using Python and deep learning techniques. The bot will process natural language input, identify the intent, and provide relevant responses based on pre-defined data. It is scalable and can be further enhanced to support more complex conversations, connect with databases, or even integrate voice support.

2.3 Technologies Used :

- Programming Language: Python
- Libraries & Frameworks:
  - TensorFlow – for building and training the neural network
  - NLTK – for natural language processing tasks
- Tools: Google Colab
- Data Storage: JSON format for training data (intents.json)
- Model Type: Deep Neural Network (Feedforward)

3. Overall Description :-

3.1 Product Perspective :

This chatbot acts as a simple, self-contained AI assistant focused on handling student and visitor queries. It is designed to be trained on intent-based data and used directly through a command-line interface in Google Colab, requiring no front-end interface.

3.2 Product Functions :

- Accepts text input from users.
- Classifies user intent using a trained model.
- Responds appropriately using predefined responses.
- Easy-to-train model that can be updated by modifying the intents.json file.

3.3 User Characteristics :

- Students (new or existing) looking for quick information about the college.
- Parents or visitors making inquiries.
- Administrative staff for internal support.

3.4 Constraints & Assumptions :

- Internet connection is required to use Google Colab.
- The chatbot works based on pre-trained intents only; it does not learn new queries on the fly.
- Accuracy depends on the quality and range of the dataset.
- Currently only supports English queries

4.Functional Requirements :-

ID	Function	Description
FR1	Query Input	User submits a text-based question via the terminal.
FR2	Intent Detection	The chatbot predicts the user's intent using a neural network model.
FR3	Response Selection	Based on the intent, the bot selects and returns a suitable predefined reply.
FR4	Data Management	Uses `intents.json` file for storing questions (patterns) and responses.
FR5	Retrainability	The chatbot can be retrained with new data to support more queries.

5.Non-Functional Requirements :-

ID	Requirement	Description
NFR1	Usability	Simple terminal interface makes it easy for anyone to interact with the bot.
NFR2	Performance	Delivers fast and accurate responses using optimized neural network models.
NFR3	Scalability	New intents and questions can be added without major code changes.
NFR4	Portability	Can run on any platform with internet access via Google Colab.
NFR5	Maintainability	Code and intent structure is modular and easy to maintain or upgrade.

6. External Interface Requirements :-

Interface Type	Description
User Interface	Command-line interaction within the Google Colab notebook.
Data Interface	Interacts with a JSON file (`intents.json`) for training and response data.

7.Future Enhancements :-

- Integrate voice input and text-to-speech for a more interactive experience.
- Link chatbot to a web-based front-end for broader access.
- Connect the bot to a live database for dynamic responses.
- Add multilingual support to accommodate regional language queries.

8. Conclusion :-

The College Enquiry Chatbot is a smart solution designed to streamline college inquiry handling. It uses deep learning and NLP to simulate human-like interactions. Its simplicity, flexibility, and ability to evolve make it a useful tool for educational institutions aiming to enhance their digital communication systems.