AI ML ASSIGNMENT REPORT WEEK 1

TITLE

BotGuide : AI-Powered Campus Navigator

ABSTRACT

BotGuide is a chatbot created to help students and visitors move around the Chanakya University campus. The system works by treating the campus as a network of locations and applying search methods (BFS, DFS, UCS, A*) to find suitable routes. Apart from showing directions, it can also answer common questions, provide building information, and share details about departments and services. With the help of AI and Natural Language Processing, BotGuide makes campus navigation faster and easier, while also showing how intelligent agents can solve everyday problems.

INTRODUCTION

For newcomers, a large university campus can be confusing. Many face trouble in locating classrooms, offices, or facilities, which can lead to stress and wasted time. Traditional solutions like signboards or printed maps are not very interactive and cannot give step-by-step help.

BotGuide is designed as a digital companion that answers queries through simple conversation. Students can ask about directions or services, and the chatbot will reply instantly. By combining AI-based search techniques with a user-friendly chatbot interface, BotGuide improves the campus experience and saves time for both students and visitors.

PROBLEM STATEMENT

Common difficulties faced by students and visitors include:

- Trouble in finding the shortest or easiest way to move across the campus.
- Lack of quick access to building details, services, and timings.
- Difficulty in getting instant answers to frequently asked questions.

Because there is no interactive assistant available, people depend on asking others or guessing their way, which leads to delays and confusion.

OBJECTIVES

- Build a graph-based model of the Chanakya University campus.
- Use BFS, DFS, UCS, and A* algorithms to find routes between places.
- Provide a chatbot system to answer navigation and information queries.
- Add FAQs and department details into the chatbot's knowledge base.
- Compare and study the performance of the search methods.
- Make the campus more accessible and student-friendly by reducing confusion.

SCOPE

Included in the project:

- Navigation support across 12+ main university buildings and areas.
- Implementation of BFS, DFS, UCS, and A* for route finding.
- Chatbot-based responses for FAQs and building information.
- A text-based interface where students can interact with the bot.
- Analysis of the system using the PEAS framework.

Not included in the project:

- Indoor navigation inside buildings (like classrooms or labs).
- Coverage of areas outside Chanakya University.

DATA REQUIREMENTS

- Campus Map: A digital version showing the major buildings and pathways.
- Locations: Main Gate, Library, Admin Block, Academic Blocks A–C, Hostel, Canteen, Sports Complex, Medical Center, Student Center, Auditorium, Flag Post, Registrar Office.
- Path Details: Distances and walking routes between the above places.
- Department Information:
    - Admin Block: Humanities, Management, Mathematics, Law & Policy.
    - Academic Blocks: Biosciences, Engineering, etc.
- FAQs: Examples include "How to reach the library from the hostel?" or "Which is the quickest route to the canteen?"

TOOLS & TECHNOLOGIES

- Language: Python is the core programming language.
- Chatbot Frameworks: Rasa or Dialogflow will handle conversations.
- Interface: Streamlit will provide a simple web-based user interface.
- Database: MySQL will store FAQs, path data, and department details.
- Algorithms: BFS, DFS, UCS, and A* will be used for pathfinding.
- Optional API: Google Maps may be added for more accurate navigation.
- NLP Tools: Used to understand and process natural language queries.