**NAME: Druthisha. B**

**Computer science Artificial Intelligence**

**Reg no: 24UG00309**

**TITLE:** **Build a Student Campus Navigator -BotBrain**

**ABSTRACT:**

This project intends to develop and guide students through the Chanakya University campus both on and offline. The system will model the campus as a graph with buildings as nodes and routes as weighted edges. Using search algorithms like BFS, DFS, Uniform Cost Search (UCS) and A\* with Euclidean distance heuristic this will be able to find optimal paths between campus destinations efficiently. More over the agent will offer simple building information and services saving time for the students and improving their campus life as a whole. The project will also compare and analyze various search approaches to identify their effectiveness in pathfinding.

**INTRODUCTION:**

Finding way in a big university campus to be confusing for new students and visitors most of the time. Conventional paper maps or verbal directions might not be effective in delivering instant and precise directions. With the growing necessity for intelligent solutions for smart campuses an AI navigation assistant can serve real time personalized directions for the students.

The project applies search algorithms and principles of intelligent agent design to build a campus navigator in Chanakya University in the virtual world. The application will guide students to find buildings navigate shortest or alternative paths and obtain useful information regarding campus facilities. Through graph model representation of the campus and the use of AI problem solving techniques the project shows how artificial intelligence concepts are applicable in real world contexts.

**PROBLEM STATEMENT:**

Students and guests tend to encounter problems in locating certain locations on campus resulting in wasted time and inconvenience. Current solutions like static maps or generic purpose navigation apps do not offer personalized information regarding campus buildings one way directions or areas with restricted access. Hence an intelligent system is needed that:

* Guarantees correct navigation between buildings on campus.
* Recommends shortest or alternative directions utilizing AI search algorithms.
* Provides pertinent building information (eg: library hours, office amenities).
* Assists in enhancing student experience through minimizing confusion and saving time.

**OBJECTIVES:**

1. To represent Chanakya University campus as a graph with buildings as vertices and paths as weighted edges.
2. To apply BFS, DFS, UCS, and A\* search algorithms for finding the path.
3. To create a text-based interface for user input with source and destination.
4. To combine basic building information services with the navigation system.
5. To compare the performance of various search algorithms in terms of nodes explored and efficiency of the shortest path.
6. To showcase the project as a working demo accompanied by technical documentation.

SCOPE:

1. Campus navigation by search algorithms.
2. Graph representation of a minimum of 12 campus buildings.
3. Text-based pathfinding interface.
4. Simple building information retrieval.
5. Comparing and analyzing algorithms.
6. Real-time GPS-based navigation.
7. Complete mobile app with live tracking.