**Week 1 – Getting Started with BotBrain**

**Project Name**

**BotBrain: A Smart Campus Navigator for Chanakya University**

**What the Project is About**

Students (especially freshers) often get lost while trying to find classrooms, labs, or offices on campus. Our idea is to create **BotBrain – a digital guide that helps students navigate the campus quickly and easily.** We will represent the campus as a **graph** and use AI pathfinding techniques such as **BFS, DFS, UCS, and A\*** to suggest the best route between two places. Along with directions, it will also display the **total distance, estimated walking time, and even a map visualization.**

**The Main Issue We’re Solving**

Finding your way on a big campus can be frustrating and time-consuming. Sometimes, students waste 10–15 minutes just figuring out the correct building or shortcut. Our project’s goal is to reduce this problem by building a **virtual navigator that suggests the shortest and smartest routes inside the university.**

**Goals of the Project**

* Design the campus as a **weighted graph** with at least 12 key spots.
* Apply and compare **four search algorithms**: BFS, DFS, UCS, and A\*.
* Create a **simple interface** where users can pick “from” and “to” locations.
* Show results clearly: **path → total distance → walking time.**
* Highlight the chosen route on a **visual campus map.**
* Give some insights into **how many steps each algorithm takes** to reach the destination.

**What We Will Cover (Scope)**

* Navigation is limited to **Chanakya University campus only.**
* It won’t track live GPS but will work on a **fixed digital model** of the campus.
* The project will include:
  + A working Python program
  + A small UI for interaction
  + Documentation + presentation
  + GitHub repo for code and report

**Features We’re Planning**

**Behind the Scenes (Back-end)**

* Graph with 12 buildings connected through weighted paths.
* Pathfinding using BFS, DFS, UCS, and A\*.
* Automatic calculation of distance and walking time.

**What Students See (Front-end)**

* Dropdowns for selecting start and destination.
* Option to choose which algorithm to use.
* “Find Path” button that shows results.
* Campus map with highlighted route.
* Information on each building (example: “Library – Open till 10 PM”).

**Extra Insight**

* Show how many nodes/steps each algorithm explored before giving the answer.

**Data We’ll Need**

* **List of Buildings (Nodes):** Around 12 locations like Main Gate, Admin, Library, Hostel, etc.
* **Connections (Edges):** Distances in meters between buildings.
* **Coordinates:** X and Y positions for A\* calculations.
* **Extra Info:** Quick notes on each location (e.g., canteen timings).

**Tools We’ll Use**

* **Language:** Python
* **Libraries:** Tkinter / PySimpleGUI for UI, NetworkX + Matplotlib for graph/map visualization
* **Maps (Reference Only):** Google Maps API or OpenStreetMap to sketch campus layout
* **Documentation:** MS Word, PowerPoint