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**Basic Chatbot Interface**

Built a text-based chatbot in Python.

Accepts queries such as:

Find path from Hostel to Library using BFS

Navigate from Main Gate to Admin using UCS

Info about Library

Returns: found path, total distance, estimated walking time, and building information.

Default navigation taken care of using UCS (shortest path) unless an algorithm is specified.

**NLP & Query Processing**

Integrated a lightweight NLP module (regex & keyword-based parsing).

Intents detection:

Navigation → Extracts source, destination, algorithm.

Information → Extracts building, department, staff, or facility.

Does not depend on heavy ML libraries → provides simplicity and readability for assignments.

**Navigation Module**

Utilizes graph representation of Chanakya University campus (12+ buildings).

Search algorithms implemented:

Breadth-First Search (BFS)

Depth-First Search (DFS)

Uniform Cost Search (UCS)

A\* Search (using heuristic)

Outputs: path sequence, total distance, estimated walking time.

Supports constraints such as one-way roads and different speeds.

**Database Connection**

Embedded SQLite database for organized information.

Schema contains:

Buildings (name, info)

Departments (name, building\_id)

Staff (name, designation, dept\_id, email)

Facilities (name, description, building\_id)

Supports queries such as:

Department Computer Science → Department location.

Staff → Designation + email.

Facilities in Canteen → Cafeteria, timings, services.