**REPORT - WEEK 3**

**Project Title:** Campus Graph Modeling for Autonomous Navigation

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**Week:** 3

**1. Overview**

During Week 3, the project shifted from model verification to development and implementation. The primary focus was on building the core functionality of the "BotBrain" prototype, as outlined in the project plan. This involved setting up the user interface, integrating search algorithms, and connecting the system to a database. The goal was to create a working prototype capable of answering FAQs and providing navigation directions.

**2. Process Followed**

a) **Chatbot Interface Development** A basic chatbot interface was developed to allow for simple text-based interaction. This interface provides a way for users to input their source and destination queries.

b) **Search Algorithm Integration** The search algorithms implemented in Week 2, including **Dijkstra's** and **BFS**, were integrated into the chatbot's core logic. This enables the system to calculate and provide the shortest paths between two campus locations. The user is given the option to choose which algorithm to use.

c) **Database Connection** A connection was established between the chatbot and a database containing campus information. The database was designed with tables for locations, events, and staff details. This allows the bot to retrieve and share basic building and department information, such as office hours or services available.

**3. Key Findings & Implementation Highlights**

* **Prototype Functionality:** The prototype chatbot is now operational. It can receive user queries like "Find path from Hostel to Library" or "Show route from Academic Block A to Canteen" and provide a calculated path.
* **Navigation:** The implemented navigation module successfully uses the graph model created in Week 1 to provide directions.
* **Information Services:** The system can now retrieve and display basic information from the database, enhancing its utility beyond just navigation.

**4. Issues Encountered**

* **Query Handling:** The NLP (Natural Language Processing) integration proved challenging, as the bot sometimes struggled to understand more complex or varied user queries. Further refinement will be needed to handle a wider range of phrasing.
* **UI Refinement:** The current interface is text-based and lacks a visual component. While functional, a more user-friendly UI is required for a better user experience. This will be a focus for Week 4.

**5. Week 3 Outcomes**

* A basic chatbot prototype was developed that can handle navigation queries and answer FAQs.
* The implemented search algorithms were successfully integrated with the chatbot interface.
* A working connection to the campus database was established.