CS Capstone Design

Technical Demo Grading Sheet (100 pts)

TEAM: C-LASS

Overview: The main purpose of the "Technical Demos" is to very clearly communicate the extent to which the team has identified key challenges in the project, and has proven solutions to those challenges. Grading is based on how complete/accurate the list of challenges is, , and how convincingly and completely the given demos cover the given challenges.

This template is fleshed out by the team, approved by CS mentor, and brought to demo as a grading sheet.

Risky technical challenges

Based on our requirements acquisition work and current understanding of the problem and envisioned solution, the following are the key technical challenges that we will need to overcome in implementing our solution:

C1: Chatbot Tutoring Agent The challenge is implementing a frontend interface that users can enter questions into and get a generated response back. We will need to show that we have an interface that users can enter messages into, which will be sent to our backend, and retrieve a generated answer.

C2: Domain-Specific Knowledge Graph The challenge is creating a basic knowledge graph that can be queried by our backend system for the GraphRAG process. We will need to show that this knowledge graph exists, that it can be visualized, and that our pipeline is correctly retrieval relevant information from it to inform generated responses.

C3: User Management The challenge is allowing our system to recognize what type of user is logged into the system. We will need to show that user information gets saved to our system, that the user log in feature is functional, and that the user type is displayed after logging in.

Challenges covered by demos:

In this section, we outline the demonstrations we have prepared, and exactly which of the challenge(s) each one of them proves a solution to.

Demonstration 1: Chatbot

Challenges addressed: Chatbot Tutoring Agent

Flight Plan:

1. We will enter a basic query that is relevant to the information in our knowledge graph
2. The application will display a generated response
3. We will demonstrate that this response is given in a "tutoring-style"

Evaluation:

✓ Shows that we have a working chatbot interface

Demonstration 2: GraphRAG demonstration

<u>Challenges addressed:</u> Domain-Specific Knowledge Graph

<u>Flight Plan:</u>

1. We will show the visualization of our knowledge graph
2. We will show what documents were retrieved from the knowledge graph and how they connect

<u>Evaluation:</u>

- ✓ Shows that the knowledge graph exists
- ✓ Shows that it can be visualized
- ✓ Shows that it can be used in a RAG pipeline

Demonstration 3: Log in system demonstration

<u>Challenges addressed:</u> User Management

<u>Flight Plan:</u>

1. We will create an account using a "sign up" button, deciding that the account is a student account
2. We will log into the account
3. We will show that it is displayed that the user is a student

<u>Evaluation:</u>

- ✓ Shows that the user log in feature is functional
- ✓ Shows that the user information is stored in a backend database

Other challenges recognized by not addressed by demo:

- Ensuring that our chatbot agent remains between the guardrails of the information that it is provided with, and that it can act as an effective tutor
    - o We will need to implement strategic prompt engineering to accomplish this
    - o We will also need to research theories of learning, and how that can be implemented into conversational AI
- Knowledge graph editing and visualization frontend interface