


Project Type C - Capstone Assignment: Building an Interactive LLM-Powered Solution

Start Assignment

- Due 28 Oct by 12:00
- Points 45
- Submitting a website url
- Available 23 Sep at 0:00 - 28 Oct at 12:00

Objective

Develop a web-based application that enables citizens to interact seamlessly with publicly available information regarding a specific process or transaction with the government. The application should consolidate information or data from multiple official or trustworthy sources, facilitate a deeper understanding through interactive engagements, and present the relevant information in the way that is customised based user inputs and in the highly effective formats for the users to consume the information.

 If you opt for **Project Type A and B**, you can skip this assignment (DO NOT make any submission in this category).




There will be a separate "assignment" page that is similar to this for teams who opt for Project A and B.

Overview of Specifications

Upon completing the Bootcamp, you are required to synthesize their acquired knowledge into a comprehensive capstone project. This project will demonstrate the ability to build a web application that serves as a platform for citizens seeking information on a specific process or transaction with the government. The application should:

1. **Consolidate Information:** Aggregate data from various **official and trustworthy sources that are publicly accessible** to provide a unified repository of information related to the chosen domain area.
2. **Personalize User Experience:** Allow users to input generic, non-personally identifiable information to receive tailored guidance and information relevant to their specific scenarios.
3. **Enhance Understanding:** Generate interactive content, including explanations, elaborations, and responses to follow-up questions, facilitating a deeper comprehension of the process.
4. **Presenting the Information Effectively:** Present information through a combination of various formats such as text, data tables, data visualizations, and interactive forms to enhance user

engagement and understanding.

For general information on Project Phase, such as timeline, deadlines, and number of members, please see  [Info Deck for Project Phase](#)  .

(<https://canvas.instructure.com/courses/9748108/pages/info-deck-for-project-phase>).

Note: Project Type C), which is this Capstone Assignment is **an individual-based assignment**.

For questions or discussions related the Capstone Assignment, please post them in [Discussion: Type C - Capstone Assignment](#)
(https://canvas.instructure.com/courses/9748108/discussion_topics/23369044)

★ Potential Domain Areas

Learners can choose any of the following domain areas to focus on for their capstone project:

1. **Buying HDB flat in the resale market**
 2. **Navigating Healthcare Coverage and Protection (MediShield Life and Medisave)**
 3. **Understanding CPF (Central Provident Fund) Policies**
 4. **Starting a Business (Business Registration and Licensing)**
 5. **Applying for Financial Assistance Schemes:** Assistance with applications for schemes like ComCare or the Silver Support Scheme
 6. **Understanding Environmental Regulations (Waste Management and Recycling)**
 7. **Other process or transaction with government agency that not overly niche,**
 - Choose any other relevant process or transaction involving a government agency that is significant but not overly specialized.
 - This could include areas such as bidding for the tender for rental of hawker stall, tax filing, public service applications, or community services.
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Use Cases for the Multi-Page Streamlit App

To ensure comprehensive coverage of functionalities and provide meaningful value to users, EACH application must implement **AT LEAST TWO USE CASES**.

Each use case represents a pivotal feature that addresses specific user needs in the chosen domain area. The examples of use cases are shown as below:

[Example] Domain Area: Understanding CPF (Central Provident Fund) Policies

1. **Retirement Planning Simulator:**
 - This use case will allow users to simulate various retirement scenarios based on information, such as their retirement goals, current CPF savings, expected contributions, and retirement age. Users can adjust parameters to see how different financial choices

affect their retirement funds, helping them make informed decisions about their financial future, housing decision, based on accurate and latest information about CPF policy.

2. CPF Policy Explainer with Interactive Scenarios based on User Inputs:




- Users can explore different CPF policies through interactive scenarios that illustrate how various policies apply to real-life situations (e.g., housing withdrawals, healthcare financing). This feature will enhance understanding by allowing users to see the practical implications of CPF policies in their lives.

Deliverables

1. Web Application:

- A **fully functional, deployed web application accessible via a URL, demonstrating all required features and the two specified use cases.**
- The suggested platform for deploying the web application is **Streamlit Community Cloud.**
- It is recommended to password protect the application.

2. Documentation (As Pages within the Streamlit App):

- In addition to the webpages that include the required features and functionality, your Streamlit app **MUST contain the following two additional pages:**
 - **“About Us” Page:**
 - A detailed page outlining the project scope, objectives, data sources, and features.
 - **“Methodology” Page:**
 - A comprehensive explanation of the data flows and implementation details.
 - A flowchart illustrating the process flow for each of the use cases in the application. For example, if the application has two main use cases: a) chat with information and b) intelligent search, each of these use cases should have its own flowchart.
 - Refer to the [sample here](https://abc-notes.data.tech.gov.sg/resources/Data%20Literacy%20ePrimer%20-%20Proj%20Scoping%20Doc%20Template%20-%20Sample%20-%20WOG.pdf)  (<https://abc-notes.data.tech.gov.sg/resources/Data%20Literacy%20ePrimer%20-%20Proj%20Scoping%20Doc%20Template%20-%20Sample%20-%20WOG.pdf>) for the samples of the flowcharts and methodology (Slide 13, 14, and 15).
 - OPTIONAL: [editable template](https://abc-notes.data.tech.gov.sg/resources/Data%20Literacy%20ePrimer%20-%20Proj%20Scoping%20Doc%20Template%20-%20WOG.pptx)  (<https://abc-notes.data.tech.gov.sg/resources/Data%20Literacy%20ePrimer%20-%20Proj%20Scoping%20Doc%20Template%20-%20WOG.pptx>) (this is .pptx of the sample for your usage/reference; you don't need to submit this file) 

3. Source Code (Upon Request):

- Well-documented Python code for the web application, including all scripts related to data processing, LLM integration, and UI components.
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Assessment Criteria

Qualifying Criteria: A Working WebApp that can be accessed via Internet.

1. Functionality & User Experience (35%):

- The application meets all specified requirements and functions as intended.
- Intuitive and user-friendly interface across multiple pages.

2. Technical Implementation (25%):

- Proper use of prompt engineering, prompt chaining techniques, and tools for LLM Agen' 
- Safeguard the app from prompt injection and minimise the chances of which the app being exploited.

3. Innovation and Creativity (15%):

- Unique features that enhance user interaction and understanding.
- Creative solutions to data integration and presentation challenges.

4. Documentation (25%):

- Comprehensive and clear documentation of "About Us" and "Methodology" pages.

Note: A passing score is 60%. Only "Pass" or "Fail" will be shared.

Plagiarism is taken seriously. If any submission is found to be plagiarized, both the original and the copied work will receive a "Fail."



Guidelines and Tips

- **Start Early:** Begin by outlining the project structure and identifying all necessary data sources.
- **Plan Prompts Carefully:** Invest time in designing effective prompts for the LLM to ensure accurate and relevant responses.
- **Focus on User Experience:** Prioritize creating an interface that is easy to navigate and visually appealing across all use cases.
- **Iterate and Test:** Continuously test your application during development to identify and fix issues promptly.
- **Leverage the Learning from the Bootcamp :** Apply the knowledge and skills acquired during the training phase, including prompt engineering, LLM parameters, prompt chaining, and agents with tools.

Important Information

This capstone project is intended as a learning exercise to help you apply the knowledge and skills acquired during the Bootcamp.

The **resulting web application is an output of an educational assignment and should be treated as such.**

It is **NOT intended for real-world use and should not be relied upon for making any decisions**, especially those related to financial, legal, or healthcare matters.

You **MUST NOT**:

- Promoting or distributing this application to the general public or wider audience.
- Using real user data or any sensitive information in the development or deployment of this application.
- Using this application for any purpose that could potentially harm or mislead users.

You are REQUIRED to place the following disclaimer on the main page of your application.

You may use "`st.expander`" so the disclaimer can be collapsed or expanded.

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IMPORTANT NOTICE: This web application is a prototype developed for **educational purposes only**. The information provided here is **NOT intended for real-world usage** and should not be relied upon for making any decisions, especially those related to financial, legal, or healthcare matters.

Furthermore, please be aware that the LLM may generate inaccurate or incorrect information. You assume full responsibility for how you use any generated output.

Always consult with qualified professionals for accurate and personalized advice.

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Submission Method

- **Submit the URL and the app password BOTH in**
 - Canvas
 - Miro Board (*Optional; we strongly encourage you to share your app and gather inputs/feedback from the fellow learners*)
- **Steps for Canvas**

- Go to "Assignments" on the left panel, then choose the "Project Type C - Capstone Assignment..." among the assignments and quizzes
- Click the "Start Assignment" button

The screenshot shows the Canvas LMS interface. On the left is a navigation menu with links: Home, Announcements, Discussions, Quizzes, People, and Assignments (which has a red circle with the number 1 next to it). The main content area has a breadcrumb trail: GVT-ABC-2024-02 > Assignments > Project Type C) - Capstone Assignment... Below this is the assignment title 'Project Type C) - Capstone Assignment: Building an Interactive LLM-Powered Solution' with a red circle with the number 2 next to a 'Start Assignment' button. Below the title, it shows 'Due Oct 31 by 11:59pm', 'Points 0', and 'Submitting a text entry box or a website url'. Below that, it says 'Available after Sep 23 at 12am'. The 'Objective' section states: 'Develop a web-based application that enables citizens to interact seamlessly with publicly available information regarding a specific process or transaction with the government. The application should consolidate information or data from multiple official or trustworthy sources, facilitate a deeper understanding through interactive engagements, and present the relevant information in the way that is customised based user inputs and in the highly effective formats for the users to consume the information.' The 'Overview of Specifications' section states: 'Upon completing the Bootcamp, you are required to synthesize their acquired knowledge into a comprehensive capstone project. This project will demonstrate the ability to build a web application that serves as a platform for citizens seeking information on a specific process or transaction with the government. The application should:'

- Enter the URL to your Web Application
- If your app password protected, please share the password with in the "comment" text box.

The screenshot shows the assignment submission form. It has a 'Website URL' field at the top. Below it is a text box with the instruction: 'Copy and paste the link to the web site you'd like to submit for this assignment.' Below that is another 'Website URL:' field with the value 'https://myapp.streamlit.app/'. Below that is a large text box for comments, containing the text 'password="12345"'. To the right of the comment box is a smiley face emoji icon. Below the comment box are three icons: a thumbs up, a clapping hands, and a sad face. Below these icons are two radio buttons: 'Send comment to instructor only' (which is selected) and 'Send comment to the whole group'. At the bottom are two buttons: 'Cancel' and 'Submit Assignment'.

• Steps for Miro Board

- Go to https://miro.com/app/board/uXjVLZmoKsk=?share_link_id=529428534446
- (https://miro.com/app/board/uXjVLZmoKsk=?share_link_id=529428534446)
- Passcode: "abc-2024"
- Create a Sticky Pad under the **Domain** that best fit your application.

Domain #1: HDB Flat in Resale Market

[SAMPLE]

URL: myapp.streamlit.app

Password: "12345"

Name: Nick Tan (GovTech).

Happy to receive your comment/
feedback!