CSC 496 Fall 2023
Lab 3: Build an app with API and third-party library (Group Project)

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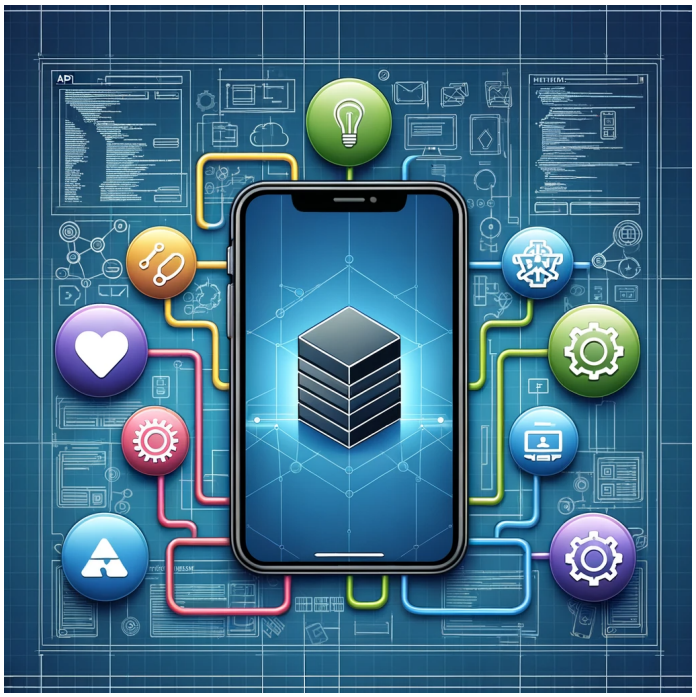

Figure 1: APP with API and with 3rd party lib

Introduction

The goals of this lab are:

- Learn to integrate external APIs into application development.

- Construct a dynamic user interface to display API data.

Our course webpage: https://www.cs.wcupa.edu/schen/ios23/

Group Project Information

This is a group project, and each group can have a maximum of two members. When submitting your final code, not only should you submit the program (.zip) to the D2L system, but you also need to submit a report (in PDF format). The report must include the following sections:

Title Page

This should include the title of the lab, "API Integration and Dynamic UI Design," the course number, names of all members of the group, and the submission date. Please make this a separate page.

Introduction

In this section, describe the importance and relevance of integrating external APIs into application development and the need for a dynamic user interface. Discuss your primary objectives and the expected outcome of the application you developed. Remember, this should be in your own words; do not simply replicate the lab instructions.

App Development Document

Detail the entire development process of your application:

- Briefly explain the API you chose and its significance.
- Describe the user interface design, emphasizing dynamic elements and user interaction.
- Discuss the third-party libraries used and their role in the application.
- Use both text and relevant figures, such as screenshots of the application at different stages or specific features. Ensure that the screenshots are original and clearly depict the features of your application.

Discussion and Conclusion

Discuss the main challenges encountered while integrating the API and designing the user interface. Elaborate on the solutions devised to overcome these challenges and any innovative methods or tools used. Reflect on the user experience and the response of the dynamic UI elements to the fetched API data. Finally, conclude by suggesting potential features or

improvements that could enhance the application's functionality or user experience in the future.

Lab Instructions

Objective

Develop an application that fetches and displays data from an external API. The application should allow the user to request new data and should incorporate dynamic imagery based on the fetched data.

Key Concepts to Cover

- API integration
- User interface design
- Asynchronous programming (optional for bonus points)

Requirements

1. **API Selection:** Choose an API for integration from this list. Alternatively, you may opt for any other API that does not require authentication. If the 3rd party API you choose requires authentication (e.g., OAUTH2), you are responsible for handling the authentication and login procedures. Dr. Chen will not be able to assist in debugging this portion of the code.
2. **Data Fetching:** Develop an application capable of fetching at least two properties or data fields from the selected API. Alternatively, students can fetch data from two or more APIs.
3. **User Interface (UI):** Create a user interface to display the fetched data. Implement a feature allowing the user to initiate new data requests. For example, if you choose a Weather API, the UI should enable the user to specify a state (like PA or NY) for data fetching.
4. **Dynamic Imagery:** Incorporate at least one changeable image in the UI. The image should update based on the fetched data. For instance, the image could turn red if the fetched daily temperatures exceed a certain threshold.
5. **Library Usage:** Utilize at least one third-party library in the development of your application.

Bonus Criteria

- **Asynchronous Programming:** Earn a 2 points bonus if you implement asynchronous programming using `async/await` for data fetching and handling.

Evaluation Criteria

- Successful API integration and data retrieval (60%)
- Proper UI/UX design reflecting both aesthetics and user experience (10%)
- Code readability and comments (10%)
- Detailed Lab Report (20%)
- Bonus points for asynchronous programming (2 points)

Deliverables

Submit your group's lab report (in PDF format) and entire project via a compressed zip file to D2L under the appropriate lab assignment. Your folder should include both code and project setting files.

Submission

- Check the lab due date on the course website. Late submissions will not be accepted.
- Submit your assignment to D2L directly.
- In addition to the program, remember to submit a report in PDF format.
- **No copy or cheating is tolerated**. If your work is based on others' or AI, please give clear attribution. Otherwise, you **WILL FAIL** this course.