# COMP 3760 Assignment: Custom Web Server and Client App Development

## Objective:

Develop a custom web server capable of handling image uploads from a React app and a native client application, managing multi-user uploads, and ensuring compatibility with web protocols.

## Detailed Tasks:

### 1. Custom Web Server Development

a. Servlet Interface/Abstract Class Design

* Define a "Servlet" interface or abstract class with methods doGet and doPost, which accept request and response objects as parameters.
* Define HttpRequest and HttpResponse classes for handling HTTP messages.

b. FileUploadServlet Development

* Implement FileUploadServlet which extends or implements "Servlet" and its methods to handle file uploads and render content to the browser.

c. Multithreading and Synchronization

* Ensure the server supports simultaneous uploads from multiple users.

d. Java Reflection Usage

* Demonstrate dynamic loading and invoking of FileUploadServlet using Java Reflection. (Can Skip)

e. Logging and Debugging

* Implement runtime logging, including debug messages on the console and exception logging to a file.

f. Response Handling

* Return an alphabetically sorted listing of the images folder as a response.

g. Request Type Handling

* Differentiate between requests from a browser and a desktop/native app, altering response format accordingly (HTML or JSON).

h. Exception Handling

* Define and utilize at least one custom exception.

### 2. Native Client App Development

a. Image Uploading

* Implement image uploading functionality using Java/TCP, adhering to multipart data protocols.

b. Dual Server Compatibility

* Ensure the app can upload images to both the Tomcat web app and the custom server developed in step 1.

## Submission Instructions:

- Code Submission: Submit the code (preferably a GitHub repo link) and a readme.txt file with instructions for compiling and running the code.  
- Team Member Contributions: Identify and document how work was split among team members, specifying ownership per class and detailing testing done.  
- Demo Submission: Record and upload a demo of your solution. Be prepared for a live online demo around the due date.

## Reference Code:

Attached is the code to get you started on this assignment. Enhance the given reference code to enable the ConsoleApp to communicate with the React app's upload web app and the custom UploadServer developed in this assignment. The enhanced UploadServer should return a file uploader HTML page when accessed via a browser, parse the incoming multipart content in the HTTP Request, and save the image file in a local directory.