DESIGN MOCK-UP

CRC Cards (Angular2 based)

Components (UI objects)

1 App

Parent Class: None

Subclasses: None

Responsibilities

- Encases the other components
- Enables the router
- Defines generic styling

Collaborators

- Router

2 Dashboard

Parent Class: None

Subclasses: None

Responsibilities

- Display the user's files
- Provide interface for user to interact with their content
- Allow users to share their files
- Facilitate code importing/exporting for users
- Allow users to create and delete files

Collaborators

- Header
- Router
- File Storage Service
- Authorize Service

3 Settings

Parent Class: None

Subclasses: None

Responsibilities

- Allow user to change their information
- Provide UI option(s)

Collaborators

- File Storage Service
- Authorize Service

4 Header

Parent Class: None

Subclasses: None

Responsibilities

- Provide UI component for the top bar
- Allow bar to be customized
- Allow other components to compose and control behavior of header

Collaborators

- None

5 Landing

Parent Class: None

Subclasses: None

Responsibilities

- Provide UI component for the landing page
- Display registration and login options

Collaborators

- Register
- Login
- Router

6 Compiler

Parent Class: None

Subclasses: None

Responsibilities

- Display compiled code
- Communicate information to shell
- Stop compilation
- Provide options to interact with files
- Facilitate code saving button event

Collaborators

- Compile Service

7 Guest Coder

Parent Class: None

Subclasses: None

Responsibilities

- Provide UI component for the the interface seen by guests
- Use compiler and header for GUI
- perform code running as normal

Collaborators

- Header
- Router
- Compiler

8 User Coder

Parent Class: None

Subclasses: None

Responsibilities

- Provide UI component for the interface that logged in users see
- Allow Code saving option
- Allow code exporting / downloading
- Authenticate user

Collaborators

- Header
- Compiler
- Router
- File Storage Service
- Authorize Service

9 Shared View

Parent Class: None

Subclasses: None

Responsibilities

- Header
- Compiler
- File Storage Service
- Router

Collaborators

- Header
- Compiler
- File Storage Service
- Authorize Service

10 Registration

Parent Class: None

Subclasses: None

Responsibilities

- Provide fields for creating accounts
- Secure user credentials
- Route users to their dashboards

Collaborators

- Router
- Authorize Service

11 Login

Parent Class: None

Subclasses: None

Responsibilities

- Provide fields for users to log in to the site
- Route users to their dashboards

Collaborators

- Router
- Authorize Service

12 Not-Found

Parent Class: None

Subclasses: None

Responsibilities

- Notify users of errors
- Route users to the home page

Collaborators

- Router

Services (Injectable service objects / DAOs)

1 Authorize Service

Parent Class: None

Subclasses: None

Responsibilities

- Authenticates user logins
- Protects and prepares user requests (like log
- ins and registers)
- Creates and edits tokens for persistent authentication

Collaborators

- Router

2 File Storage Service

Parent Class: None

Subclasses: None

Responsibilities

- Facilitates file sharing and access control
- Facilitates adding,saving/storing, deleting files from/to DB

Collaborators

- Router
- Authorize Service

3 Compile Service

Parent Class: None

Subclasses: None

Responsibilities

- Correctly send requests to compilex (module)
- Decode information sent from requester send to module and retrieve output

Collaborators

- None

Misc

1 Router

Parent Class: None

Subclasses: None

Responsibilities

- Transition through various tasks and tabs
- Controls the view displayed to the user
- Controls user’s access

Collaborators

- None

CRC Model

App

- Encases the other components
- Enables the router
- Defines generic styling

- Router

Dashboard

- Display the user's files
- Provide interface for user to interact with their content
- Allow users to share their files
- Facilitate code importing/exporting for users
- Allow users to create and delete files

- Header
- Router
- File Storage Service
- Authorize Service

Settings

- Allow user to change their information
- Provide UI option(s)

- File Storage Service
- Authorize Service

Header

- Provide UI component for the top bar
- Allow bar to be customized
- Allow other components to compose and control behavior of header

- None

Landing

- Provide UI component for the landing page
- Display registration and login options

- Register
- Login
- Router

Compiler

- Display compiled code
- Communicate information to shell
- Stop compilation
- Provide options to interact with files
- Facilitate code saving button event

- Compile Service

Guest Coder

- Provide UI component for the the interface seen by guests
- Use compiler and header for GUI
- perform code running as normal

- Header
- Router
- Compiler

User Coder

- Provide UI component for the interface that logged in users see
- Allow Code saving option
- Allow code exporting / downloading
- Authenticate user

- Header
- Compiler
- Router
- File Storage Service
- Authorize Service

Shared View

- Header
- Compiler
- File Storage Service
- Router

- Header
- Compiler
- File Storage Service
- Authorize Service

Registration

- Provide fields for creating accounts
- Secure user credentials
- Route users to their dashboards

- Router
- Authorize Service

Login

- Provide fields for users to log in to the site
- Route users to their dashboards

- Router
- Authorize Service

Not-Found

- Notify users of errors
- Route users to the home page

- Router

Authorize Service

- Authenticates user logins
- Protects and prepares user requests (like log
- ins and registers)
- Creates and edits tokens for persistent authentication

- Router

File Storage Service

- Facilitates file sharing and access control
- Facilitates adding,saving/storing, deleting files from/to DB

- Router
- Authorize Service

Compile Service

• Correctly send requests to compilex (module) • Decode information sent from requester send to module and retrieve output	• None

Router

• Transition through various tasks and tabs • Controls the view displayed to the user • Controls user's access	• None

System Interaction and Environment

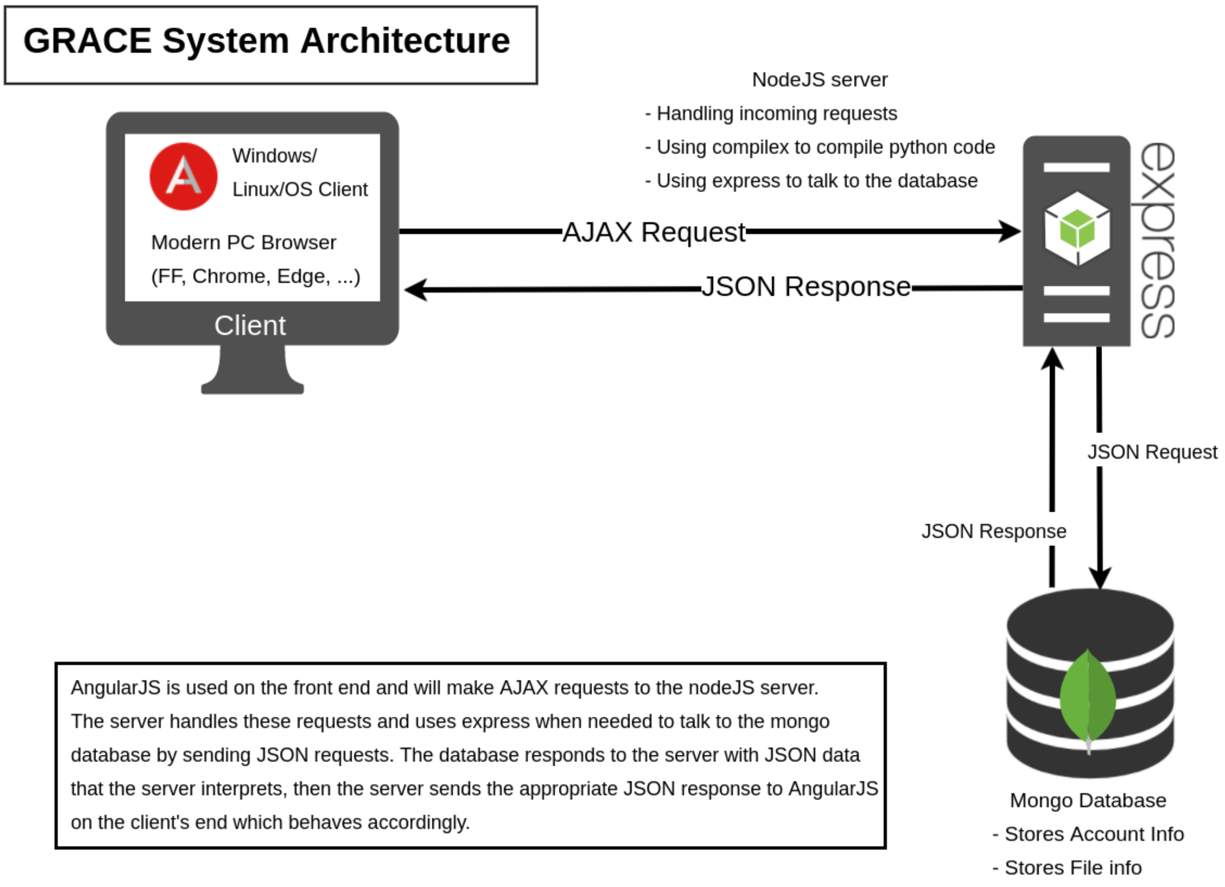
The technologies GRACE will be using will include:

- Server: NodeJS, Express, Compilex (NodeJS library)
- Database: MongoDB
- Front-end: HTML, AngularJS, JavaScript

Most widely used PC operating systems support a modern browser such as Chrome, Firefox, or Edge.
Since these browsers support our front-end technology, and the ability to make the requests to our server, most users will be able to use our web application. Support for mobile browsers will not be present in the first release of our app but is being considered as a feature in the future.

The server will be running Linux and MEAN stack from Bitnami (version 3.4.2). NodeJS on our server will include the Compilex library (version 0.7.3).

System Architecture



AngularJS is used on the front end and will make AJAX requests to the nodeJS server. The server handles these requests and uses express when needed to talk to the mongo database by sending JSON requests. The database responds to the server with JSON data that the server interprets, then the server sends the appropriate JSON response to AngularJS on the client's end which behaves accordingly.

System Decomposition

There are three main components in the GRACE REPL system architecture: client, server, and database.

The classes pertaining to the server component are angular2 services: Authorize, Compile, and File Storage. The reason being is because the client will be making requests to the server which one or more of these classes will fulfill appropriately. More specifically, the compile service in GRACE REPL will use a NodeJS library that will do the computation/interpretation on the server side. These servces will be relaying information to the view components upon getting requests from them. The services facilitate these requests using either the database or other modules.

With the use of Angular2, we were provided an intuitive framework that would allow us to treat physical components like classes and allowed the use of templating. The components we used were: compiler, header, login, registration, landing, dashboard, not-found, settings, guest-coder, user-coder, and shared-view. The interaction between the user and these client side components was governed through various event listeners, some of which would require requests to certain services which would in turn make AJAX (JSON) requests to the API.

The database component consists of solely the api.js. All requests made from our 3 services would communicate with our API which would fetch data as necessary from the database.

The system decomposition is on the system architecture diagram. It illustrates each component and its role in the higher - level architectural view.

The strategy for dealing with errors and exceptional cases will differ for each case. For the IDE and related errors such as third - party issues, the approach will be to have the users report the bug and then notify all GRACE REPL users of the existing bug. Furthermore, the GRACE team will try to resolve the issue since the Compilex library is open source and notify the Compilex developers.

For server connection issues, such as a user's inability to share and/or view files from other users, there are limitations for what the GRACE team can do. Connection issues occur all the time, so on our end the strategy is to prompt the user to refresh the page after a certain amount of time or wait until the connection is re - established. This strategy is the same for unexpected code compilation errors, since the server compiles/interprets the code.

Another case to consider is browser issues. Some less used web browsers may not be compatible with the site. The strategy will be to suggest the user of using a compatible browser; in the meantime, the team will try to alleviate the browser incompatibility.

Other general failures such as unexpected input to our backend will be dealt with by having multiple layers of validation that will eventually attempt to output an error message to the users.

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