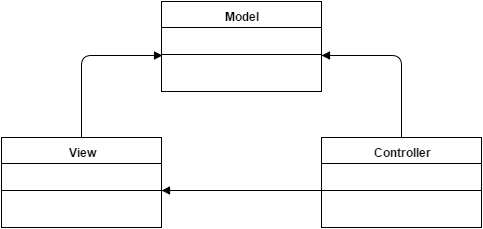
6.1 Architecture



The Apollo project will require the use of the Model-View-Controller (MVC) architecture design pattern. This pattern suits best for the development of our system because it contains distant separation between domain, the actions based on user inputs, and the presentation. This will ease up the development phase as programmers will be able to work on three different classes at the same time. The model will be the one that manages the behaviour of data, responds to information about the state, and responds to instructions to change state. To enforce this pattern, we will be using Laravel, a framework for developing web applications. The view, on the other hand, is a visual representation of the model. It will get information from the model and display it appropriately. The view will therefore need to know the semantics of the attributes of the model. We will be using Angular.js, a JavaScript framework, as well as Angular Material framework to implement a beautiful design for the user to interact with. The controller handles user interaction. The Controller will thus read data from the view, will then inform and make change to the model if desired, by controlling user input. As seen in the diagram, both the view and the controller depend on the model. However, the model does not depend on neither of them. This is one great advantage of this design architectural pattern because it allows the model to be developed and tested without having to make changes to the view.

6.2 Technologies in Use

PHP (Hypertext PreProcessor)

PHP is a web scripting language. The application is a web application which explains why PHP has been chosen as the language. The server will be running off of PHP scripts, in conjunction with Laravel (which is a PHP framework). PHP is an easy to learn and a very powerful language. It will make the project development quick and easy.

Laravel

Laravel is an open source PHP framework. It follows the MVC pattern using their own blade compiler. This allows developers to quickly deploy web projects. Laravel's Eloquent, which is uses the Object-relational mapping (ORM) technique, makes database manipulations really easy because it can access the database as if they were their own objects. Creating and populating databases to different machines is also easily done with the database migration commands they offer, they made their own database version control. Laravel has the RESTful design pattern integrated with the resource controller, therefore you can create a new REST URL in 2 lines.

JetBrains PHPStorm

The reason we chose to go with PHPStorm is because it has a lot of integrations with the IDE. The IDE has integrations such as Git, Vagrant, Composer, debug with a live server, has good code sniffing and intellisense, use the terminal (right in the IDE), Gulp, NodeJS, Laravel support, make SSH connections, even use RESTful requests. PHPStorm is very powerful tool that makes the development process faster and easier.

Gulp

Gulp is a minifying application. Gulp will be obfuscating and minifying all css and javascript files in the project. There is also a watch feature that automatically minifies and combines the javascript and css files when the user saves the file, which makes it quick for development.

Angular.js

AngularJS is an open source javascript framework. It binds data to HTML with expressions and extends HTML attributes with directives. Angular’s code is downloaded and included in the html files.

Angular will be used to perform the REST API calls on the front-end of our applications. It will communicate with the Laravel back-end. Angular Material framework will be used to implement the material design, this will give our website a easy to use, beautiful user interface.

HTML

HTML (HyperText Markup Language) is a markup language used to display content from the web. Any web app must use HTML to be able to interact with the user. HTML uses tags to describe every element on the web page.

JSON

JSON stands for Javascript Object Notation. It is a popular format used to store and exchange data. It is an alternative to the XML format. We will be using this format because it is easier to use and more readable than XML. All the information we collect and send to the user will be stored in a JSON.

Git

Git is a code repository and Github is a git hosting service. All code and documentation is maintained using Github. Using it for documentation with Google Drive is redundant; but not every team member is familiar with Github, therefore at this point in the project documentation is maintained on both systems. The benefits of Github as a repository for documentation and code is that issues can be made, team members assigned to the issue, and the issue can be tracked until resolved. Then the code or documentation can be pushed onto the repository by the issue handler.

Google Drive

Google Drive is a repository for documents. It does not offer issue tracking but has the advantage of being easy to learn. All documents can be edited by a member of the team.

Slack

Slack is a cloud based collaboration software. It enables the creation of many channels and allows for group and individual communications. Channels can also be linked to other tools and software. For example, a #calendar channel was created where group meetings are organized and scheduled; it is also directly linked to the group's Google Calendar. The #calendar channel on Slack is updated and group members alerted anytime the Google Calendar is changed. There are also a #general channel where aspects of the project are discussed, a #useful channel where important links and reminders are posted. Channels can also be made for subgroups, such #softwareteam for the programming sub-group. Alerts can specified by each team member: to receive an email notification at every update in Slack, or only for personal messages, or notification after only a certain period of time. There is also a Slack desktop app which can notify users directly.

MySQL

MySQL is an open-source relational database management system (RDBMS). It is widely used for both small and large web-based applications. We will be using MySQL due to its high-performance and reliability. Its cross-platform support suits the many operating systems that we will use. In addition, MySQL combined with PHP (our chosen programming language) allows rapid web application development.

Apache Server

The Apache HTTP Server is a powerful open-source tool that provides HTTP services and integrates well with PHP. It is a secure, efficient, and extensible web server that is easy to manage and is available for all the platforms used in our project.

XAMPP

XAMPP is a web server solution pack that stands for cross-platform Apache HTTP Server MySQL PHP Perl. It is a portable development environment that introduces consistency to a team working on multiple platforms and that allows testing on local machines. XAMPP includes the previously mentioned PHP, MySQL, and Apache Server technologies, thus enabling us to decrease development setup time.