About the Application

This is a Data Analysis application. It enables the user to interpret and visualize patterns in the data. The product queries spreadsheets and generates several graph types. The functional processes are choosing / uploading a file, running descriptive statistical analysis and regression algorithms along with graphical depiction.

Low Level Requirements

The objective of the project is to create an online statistical analysis application. The low-level requirements for the projects are as follows.

- Login with db credentials selecting type of DBMS, host, and schema. No other login (user) is required or permitted.
- Ability to create and drop all application needed DB tables. These may include user access transaction log, table(s) to maintain imported data
- Data import is in terms of Excel files (both tab delimited and comma delimited). Data import consists of two parts. One identifies a dataset that the user wishes to analyze consisting of dataset name, as well as column (variable) names and associated data type (String, double, integer, and long integer), and a code (input, computed) to indicate if this variable is in the data upload or is to be computed by the application. The other consists of the actual data to be inserted into a given dataset (selected from a drop-down list of datasets), with the first row being a header row consistent with the dataset, and subsequent rows consisting of actual data. When importing data you must check for invalid data and provide a list of problem rows as well as the option to import or not import valid data if there is invalid data. In addition, you need to provide a count of the number of rows and columns imported and successfully inserted into the database.
- Display list of tables and datasets, with ability to select one to display content details as well as content.
- Display list of datasets available for analysis and permit the user to choose a specific dataset from a dropdown list to work with. Once the user has chosen the dataset display dataset metadata including row count and column details.
- Select column(s) from chosen dataset and permit user to generate numeric descriptive statistics perform regression analysis.
- Select column(s) from chosen dataset and permit user to generate numeric descriptive statistics perform graphical analysis. (Pie Chart, Scatter Plot, Bar Plot and Time Series graphs)
- Select a requested dataset and export it in requested (Excel or XML) format.
- Display transaction log.
- Logout.

Tools,Softwares and Libraries requirements

- Any IDE's may be used to build the application(Eclipse,Netbeans) .However the framework should be JSF 2.2 and the webpages should be built on jsp. Javascript should not be used.
- MVC, JSF2.2, Java 7 (1.7) or 8 (1.8), Tomcat 8.5 or higher, Apache MyFaces and Tomahawk jsf libraries, Apache Commons Math, and JfreeChart.

Model View Controller (MVC) Pattern

We use Model-View-Controller(MVC) Design pattern for the application. The terminologies in MVC stand for

- **Model**

It represents a Java object carrying data. The Model class in the context of our application will consists of the data of the users of the application.

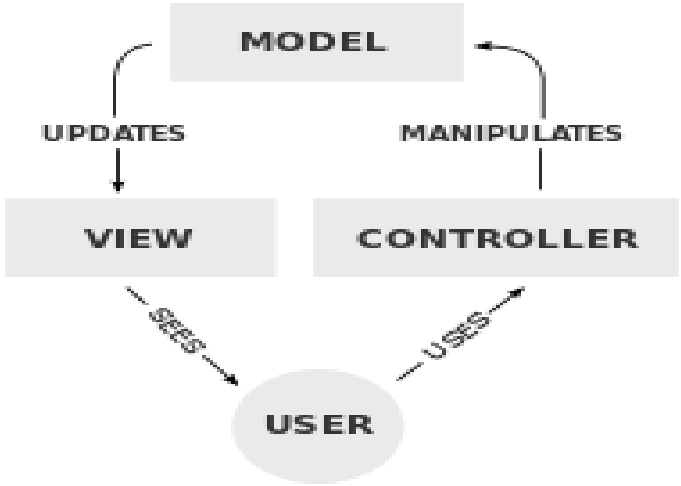
- **View**

Represents the visualization of the data that the Model contains. The View class for the application will consist of the methods that display the data of the users of the application as per request. This component has various JSP files that help users navigate through the online application.

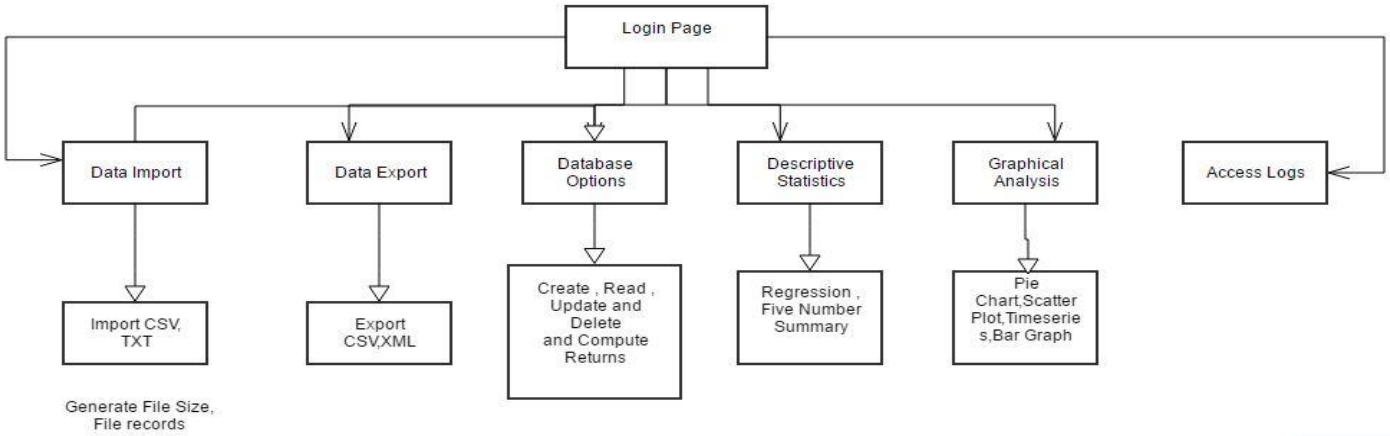
- **Controller**

This is a class that operates on Model and View classes and controls the data flow. The Java classes would contain the business logic of the application.

Flow of Data in the Application (MVC Model)



Application Flowchart



Class Diagram: