ONLINE TEST APPLICATION

About the Application

'Online Test Application' is an assessment tool for students and Instructors. The student has an ability to take the test while the instructors can upload online assessment and analyze the scores and performance of students by means of graphical and numerical analysis.

One of the approaches to deploy this web application is by using Tomcat which hosts the java web application and comprises of servlets, JSP pages, HTML pages, JavaScript, stylesheets.
Web applications are put under $CATALINA_HOME\webapps directory.
Context path: is the name which is relative to the server's address (http://localhost) and represents the name of the web application

Deployment method 1: web application archive file (.war)

The web application is packed as a WAR file using tools like Eclipse. The war(WebArchive) file is copied into $CATALINA_HOME\webapps directory. Then the server is restarted, the war file is unpacked and the application is launched.

Deployment method 2: copying unpacked web application directory

Here the web application is in the unpacked form. The directory of the application is then copied into the $CATALINA_HOME\webapps directory. The server is restarted and the application is launched with the directory name as the context path.

Deployment method 3: Tomcat manager application

We can remotely deploy the web application by means of Tomcat manager application's web interface. There is an authentication required to access this application. Using the manager, we can view a list of applications and their status on the server. Individual applications can be stopped, started and restarted.

#	Description	R	U	M	B	A	Type	Source	Criticality
1	Application should display all items in their homepage based on category of users.	Y	Y	Y	Y	Y	Functional	Management	Critical
2	Application should allow registered users to login to the website using appropriate credentials.	Y	Y	Y	Y	Y	Functional	Management	Critical
3	Application should maintain separate homepages for instructor, student and admin content based on the credentials entered.	Y	Y	Y	Y	Y	Technical	Data Warehousing	Critical
4	Application should display user's guide along with the ability to logout after logging in and programmer's documentation links that open in separate pages, and where appropriate subsequent pages should have content specific help links.	Y	Y	Y	Y	Y	Functional	Management	Critical
5	Application should allow instructor to upload a roster of student users in .csv format as well as upload assessments.	Y	Y	Y	Y	Y	Technical	Data Warehousing	Important
6	Application should have the capability to Track each user's access to the application including date time stamp, and ip address.	Y	Y	Y	Y	Y	Technical	Data Warehousing	Important
7	Application should allow Instructor to view the roster of student users in .csv format who enrolled for the specific tutor as well as view assessment reports.	Y	Y	Y	Y	Y	Technical	Data Warehousing	Important
8	Application should allow Students to view the roster of courses as well as have the ability to take multiple quizzes for each course the student has enrolled. The student should also be allowed to take multiple attempts for each quiz for a particular course.	Y	Y	Y	Y	Y	Technical	Data Warehousing	Important

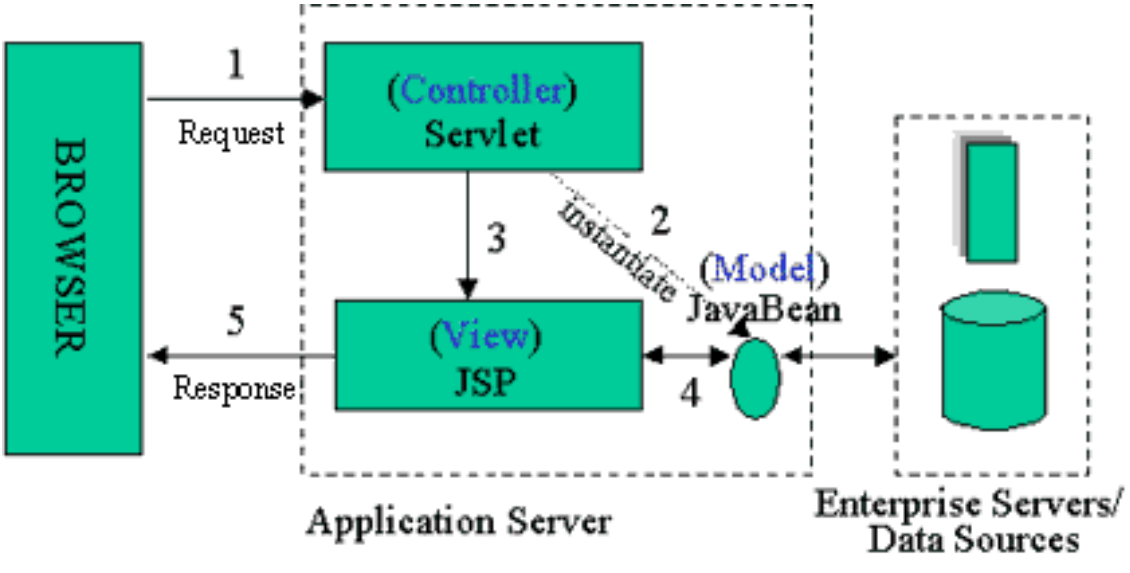
9	Application should have file menu item in instructor and TA's page to enable upload of roster of student records along with enrolled course details from a .csv file.	Y	Y	Y	Y	Y	Functional	Management	Critical
10	Application should have the file menu items in instructor to enable upload of questions to be used in quizzes.	Y	Y	Y	Y	Y	Functional	Management	Critical
11	Application should have the file menu item to download roster as well as general data of student records, quiz details including assessment records in .csv and XML format.	Y	Y	Y	Y	Y	Technical	Data Warehousing	Important
12	Application should have the capability to generate reports for displaying the score of assigned work, results of numeric and statistical analysis for the entire class.	Y	Y	Y	Y	Y	Technical	Data Warehousing	Important
13	Application should have the capability to allow instructor to generate reports for displaying data of sorted data by specific column.	Y	Y	Y	Y	Y	Technical	Data Warehousing	Important
14	Application should have the capability that permits the instructor to view all available uploaded assessment report of each student and each student should be able to view the maximum score generated amongst various attempts of quizzes pertaining to each course.	Y	Y	Y	Y	Y	Functional	Management	Critical
15	Application should have the capability that permits the instructor to perform graphical analysis consisting of histograms, bar charts and pie chart of distribution of scores.	Y	Y	Y	Y	Y	Technical	Data Warehousing	Important

MODEL VIEW CONTROLLER DESIGN PATTERN

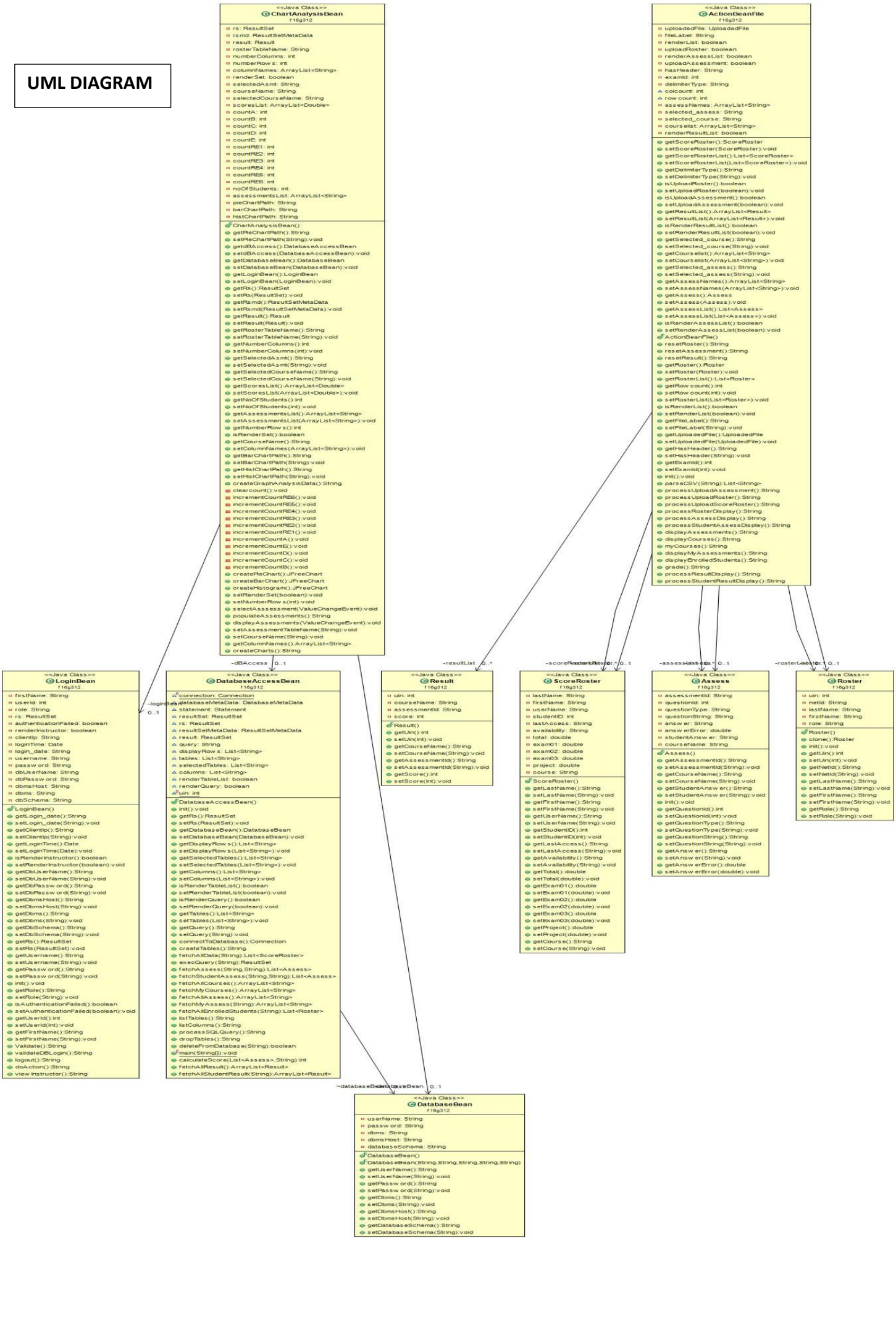
The following UML diagram shows the Model component of the MVC design which contains the variables and methods that interact with the database. It handles the data and logic of the application as per the requirement. The Model class of our application will contain user data.

The View component of the application deals with the presentation of the application by means of several jsp pages. It is responsible for displaying the Model data seen by user.

The Controller component of the MVC architecture controls the interactions between the Model and View components. It processes incoming requests, manage user input and perform application logic.



UML DIAGRAM


ChartAnalysisBean
ActionBeanFile
LoginBean
DatabaseAccessBean
Result
ScoreRoster
Assess
Roster
DatabaseBean
-dBAccess
-resultList
-scoreRoster
-assessList
-rosterList
-loginBean
~databaseBean

Database Design and Constraints

The new tables to be created as a part of the project are as follows -

f16g312_User

The table will contain the details of the student who would use the application. The columns are LastName, FirstName, UserName,Password,Role and UIN. The following represents the database representation of the Student table as per our application:

User		
UIN	Integer	PK, Not NULL
LastName	Varchar(50)	
FirstName	Varchar(50)	
UserName	Varchar(50)	
Password	Varchar(50)	
Role	Varchar(20)	

f16g312_Course

The table represents the columns for different courses. It will contain the following course information.

Course		
Courseid	Varchar(25)	PK, Not NULL
Coursename	Varchar(20)	
Section	Varchar(50)	

f16g312_roster

This table consists of students and instructors involved in the subject of accounting.

roster		
UIN	Integer	PK, Not NULL
Netid	Varchar(25)	
Lastname	Varchar(50)	
Firstname	Varchar(50)	
Role	Varchar(20)	
Course	Varchar(25)	

f16g312_Assessment

The table will consist of columns which include Questionid, Assessmentid ,Questiontype Questionstring ,Answer ,Answererror and Coursename.

Assessment		
Questionid	Integer	PK
Assessmentid	Varchar(25)	PK
Questiontype	Varchar(20)	
Questionstring	Text	
Answer	Text	
Answererror	Double	
Coursename	Varchar(20)	

f16g312_rosterStats

This table consists of students and instructors involved in the subject of statistics.

rosterStats		
UIN	Integer	PK, Not NULL
Netid	Varchar(25)	
Lastname	Varchar(50)	
Firstname	Varchar(50)	
Role	Varchar(20)	

f16g312_rosteradbms

This table consists of students and instructors involved in the subject of adbms.

rosterAdbms		
UIN	Integer	PK, Not NULL
Netid	Varchar(25)	
Lastname	Varchar(50)	
Firstname	Varchar(50)	
Role	Varchar(20)	

f16g312_enroll

The table represents the students enrolled for different courses. It will contain the following course information.

enroll		
UIN	Integer	
courseid	Varchar (20)	

f16g312_scoreRoster

The table provides the details about transactions occurred on the application. The structure of the table is as follows:

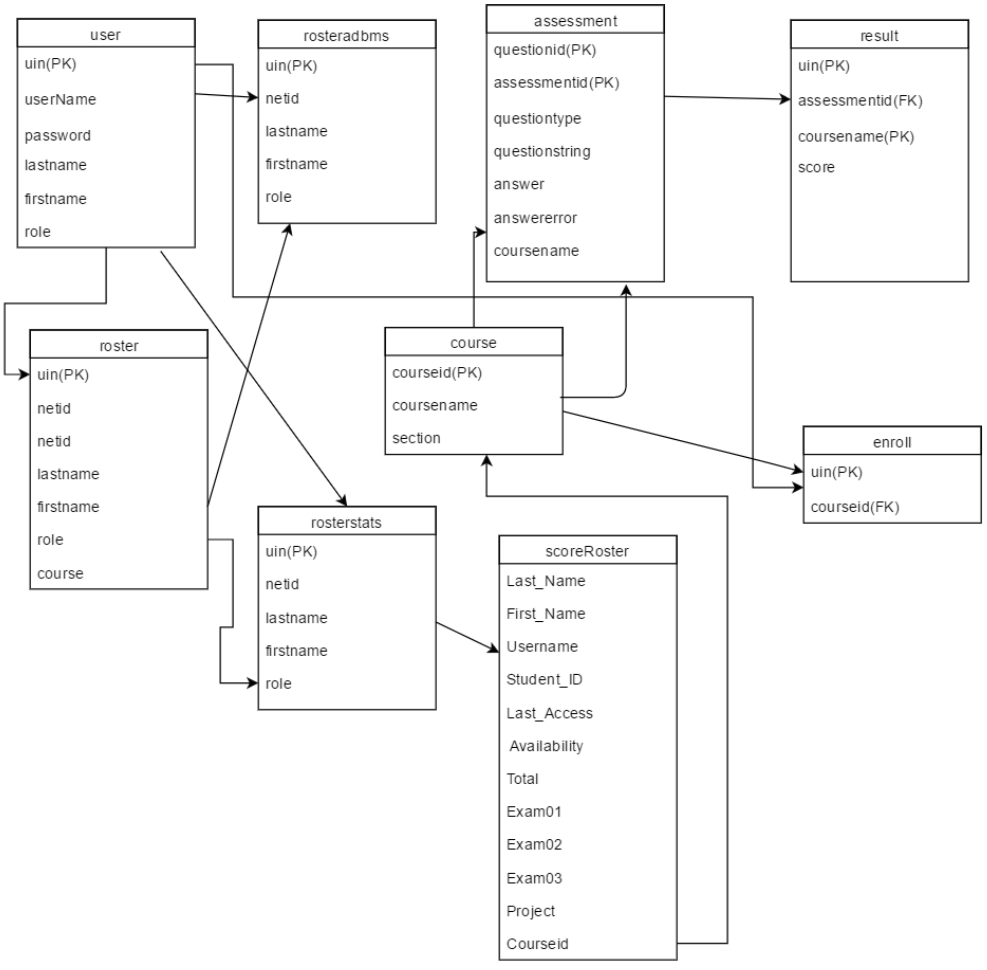
scoreRoster		
Last_Name	Varchar (45)	PK, Not NULL
First_Name	Varchar (45)	
Username	Varchar (45)	
Student_ID	Integer	
Last_Access	DATETIME	
Availability	Varchar (45)	
Total	DECIMAL (10,2)	
Exam01	DECIMAL (10,2)	
Exam02	DECIMAL (10,2)	
Exam03	DECIMAL (10,2)	
Project	DECIMAL (10,2)	

f16g312_Results

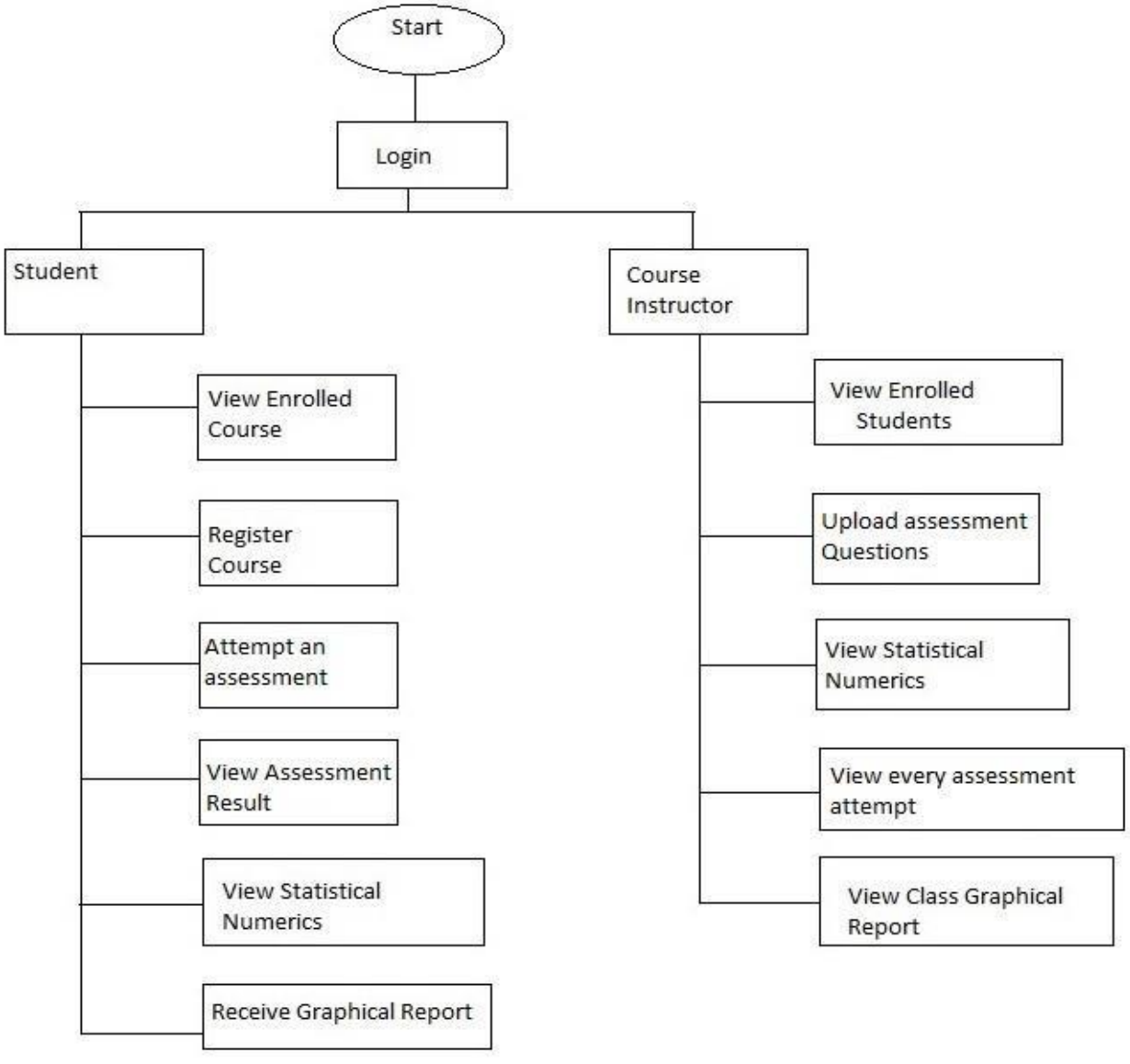
This table contains the scores of the students for combinations of tests and courses. The table can look as follows -

Results		
UIN	Integer	
assessmentid	Varchar (25)	
coursename	Varchar (20)	
score	Integer	

Relational Diagram of the Application



Navigation Flow of the application



Student

- Take Test
- View Scores or Receive Feedback
- Numerical Summary
- Graphical Summary

Instructor

Assessment Upload
View Uploaded Assessment File
View Course Registration
View Students Results
Export Results
Numerical Analysis
Graphical Analysis