Explanation of UML Diagram

The UML diagram contains the class diagram of the Course Management System which provides tools and functions to support the administration and delivery of educational courses. This system contains three main users: Admin, Student and Tutor.

The UML class diagram includes the following classes:

1. HomePage: HomePage is the main class that creates the main window and the label and buttons. The main method launches the application and the initialize method initializes the contents of the frame. The register and login methods create the SignUp and LogIn buttons respectively.

2. Details: This class contains three attributes (instance variables) named "url", "username", and "password", each of type String which are used to store data related to the connection to a MySQL database.

3. LoginPage: This class extends another class called Details. The LoginPage class has several instance variables that represent the components of the GUI (such as text fields, password field, buttons, labels, comboBox etc.). It also has three methods: initialize, signup, and login. The initialize method sets up the GUI components and sets the bounds and layout of the frame. The signup method creates a JButton for registering and opens a new SignupPage when the JButton is clicked. The login method creates a JButton for logging in and verifies the email, password, and user mode by connecting to a database using JDBC. If the credentials are correct, the program will log the user into the corresponding user mode.

4. Regix: This class contains three private attributes (instance variables) named validateEmail, validateNumber, and validatePassword, each of type String which are used to store regular expressions for email validation, phone number validation, and password validation, respectively. The class also have three public methods named getValidateEmail(), getValidateNumber(), and getValidatePassword(), each of which returns the corresponding attribute value.

5. SignupPage: This class extends the Details class and associates the Regix and user class. This class has several instance variables that represent the components of the GUI (such as text fields, password field, buttons, labels, etc.). It also has three methods: initialize, signup, and login. The initialize method sets up the GUI components and sets the bounds and layout of the frame. The signup method implements the logic for the signup functionality, including input validation and storing the signup data in a SQL database. The login method implements the logic for the login functionality.

6. user: This class connects to a database using JDBC and checks the existence of various entities in the database (student, tutor, bibm module, bsc module, and course). The class has five private fields: url, username, password, representing the connection details to the database. The class has five public methods named "isStudentExist", "isTutorExist", "isBibmModuleExist", "isBscModuleExist", and "isCourseExist". Each of these methods takes a userName as input, connects to the database using DriverManager and the private fields, creates a prepared statement, sets the input userName in the prepared statement, executes the statement and retrieves the result using ResultSet, and returns a boolean indicating the existence of the corresponding entity.

7. Dashboard: This class extends class Details. It has four instance variables that represent the components of the GUI. It has four methods: initialize() which sets up the GUI components and sets the bounds and layout of the frame, DisplayCourse() which counts and displays the number of course in the database, DisplayTutor() which counts and displays the number of tutor in the database, DisplayStudent() which counts and displays the number of student in the database.

8. CoursePage: This class extends the Details class and associates user class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has five methods: initialize() which initializes the components of the frame, table() which displays data from the database in the table, add() which allows to add new courses to the database, edit() which allows to edit existing courses in the database, and delete() which allows to delete courses from the database. The class also has a main method which creates an instance of the class and makes the frame visible.

9. ModulePage: This class has several instance variables, including JFrame, JPanel, JButton, and JLabel objects. This class contains three methods: initialize() which sets up the frame and creates UI components such as buttons and labels, bibm() and bsc() methods which creates BIBM and BscComputer Science button respectively.

10. BibmPage: This class extends the Details class and associates user class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has five methods: initialize() which initializes the components of the frame, table() which displays data from the database in the table, add() which allows to add new bibm module to the database, edit() which allows to edit existing bibm module in the database, and delete() which allows to delete bibm module from the database. The class also has a main method which creates an instance of the class and makes the frame visible.

11. BscPage: This class extends the Details class and associates user class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has five methods: initialize() which initializes the components of the frame, table() which displays data from the database in the table, add() which allows to add new bsc module to the database, edit() which allows to edit existing bsc module in the database, and delete() which allows to delete bsc module from the database. The class also has a main method which creates an instance of the class and makes the frame visible.

12. TutorPage: This class extends the Details class and associates user class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has five methods: initialize() which initializes the components of the frame, table() which displays data from the database in the table, add() which allows to add new tutor to the database, edit() which allows to edit existing tutor in the database, and delete() which allows to delete tutor from the database. The class also has a main method which creates an instance of the class and makes the frame visible.

13. StudentPage: This class extends the Details class and associates user class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has five methods: initialize() which initializes the components of the frame, table() which displays data from the database in the table, add() which allows to add new student to the database, edit() which allows to edit existing student in the database, and delete() which allows to delete student from the database. The class also has a main method which creates an instance of the class and makes the frame visible.

14. ReportPage: This class consists of a frame, panels, buttons, and labels. The initialize method sets up the frame, panel, and buttons, and sets their properties such as size, layout, background color, font, and action listeners. The main method invokes the class to display the GUI. The class also has methods level1, level2, and level3 which creates button for Level1, Level2 and Level3 respectively.

15. Report1: This class extends Details class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has three methods: initialize() which initializes the components of the frame, bscSearch that search and detail and marks of student studying bsc computer science in level 1 from the database in table, bibmSearch that search and displays the detail and marks of student studying bibm in level 1 from the database in the table. The class also has a main method which creates an instance of the class and makes the frame visible.

16. Report2: This class extends Details class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has three methods: initialize() which

initializes the components of the frame, bscSearch that search detail and marks of student studying bsc computer science in level 2 from the database in table, bibmSearch that search and detail and marks of student studying bibm in level 2 from the database in the table. The class also has a main method which creates an instance of the class and makes the frame visible.

17. Report3: This class extends Details class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has three methods: initialize() which initializes the components of the frame, bscSearch that search and displays the detail and marks of student studying bsc computer science in level 3 from the database in table, bibmSearch that search and displays the detail and marks of student studying bibm in level 3 from the database in the table. The class also has a main method which creates an instance of the class and makes the frame visible.

18. BscGenerateReport1: This class extends Details class. The class consists of a frame and several panels and text fields, and a button. The class has method initialize()which initializes the components of the frame, interacts with a database to retrieve information and display the Bsc Computer Science student report information of Level 1.

19. BscGenerateReport2: This class extends Details class. The class consists of a frame and several panels and text fields, and a button. The class has method initialize()which initializes the components of the frame, interacts with a database to retrieve information and display the Bsc Computer Science student report information of Level 2.

20. BscGenerateReport3: This class extends Details class. The class consists of a frame and several panels and text fields, and a button. The class has method initialize()which initializes the components of the frame, interacts with a database to retrieve information and display the Bsc Computer Science student report information of Level 3.

21. BibmGenerateReport1: This class extends Details class. The class consists of a frame and several panels and text fields, and a button. The class has method initialize()which initializes the components of the frame, interacts with a database to retrieve information and display the Bibm student report of Level 1.

22. BibmGenerateReport2: This class extends Details class. The class consists of a frame and several panels and text fields, and a button. The class has method

initialize()which initializes the components of the frame, interacts with a database to retrieve information and display the Bibm student report of Level 2.

23. BibmGenerateReport3: This class extends Details class. The class consists of a frame and several panels and text fields, and a button. The class has method initialize()which initializes the components of the frame, interacts with a database to retrieve information and display the Bibm student report of Level 3.

24. TutorDashboard: This class extends class Details. It has four instance variables that represent the components of the GUI. It has four methods: initialize() which sets up the GUI components and sets the bounds and layout of the frame, DisplayCourse() which counts and displays the number of course in the database, DisplayTutor() which counts and displays the number of tutor in the database, DisplayStudent() which counts and displays the number of student in the database.

25. TutorCoursePage: This class has several instance variables, including JFrame, JPanel, JButton, and JLabel objects. This class contains three methods: initialize() which sets up the frame and creates UI components such as buttons and labels, bibm() and bsc() methods which creates BIBM and BscComputer Science button respectively.

26. TCoursePage1: This class extends Details class and has several instance variables, including JFrame, JPanel, JButton, JTable and JLabel objects. This class contains three methods: initialize() which sets up the frame and creates UI components such as buttons and labels, table() and search() methods create a table to display data and a text field with a search button to search for specific data respectively.

27. TCoursePage2: This class extends Details class and has several instance variables, including JFrame, JPanel, JButton, JTable and JLabel objects. This class contains three methods: initialize() which sets up the frame and creates UI components such as buttons and labels, table() and search() methods create a table to display data and a text field with a search button to search for specific data respectively.

28. ViewStudentPage: The class contains various UI components such as JFrame, JPanel, JTable, JTextField, and JButton, among others. It also contains various methods such as initialize() which sets up the frame and creates UI components such as buttons and labels , table() and search() methods create a table to display data and a text field with a search button to search for specific data respectively. The "main" method creates an object of the "ViewStudentPage" class and sets the visibility of the JFrame to "true".

29. AddMarksPage: The class extends the class "Details" and consists of various JPanels, JButtons, JTextFields, and JComboBoxes to display the information. The methods "initialize" and "addbscMarks" and "addbibmMarks" are used to set up the frame, populate the comboboxes, and add marks of the student in the database.

30. StudentDashboard: This class extends class Details. It has four instance variables that represent the components of the GUI. It has four methods: initialize() which sets up the GUI components and sets the bounds and layout of the frame, DisplayCourse() which counts and displays the number of course in the database, DisplayTutor() which counts and displays the number of tutor in the database, DisplayStudent() which counts and displays the number of student in the database.

31. EnrollPage: This class extends class Details and associates class user. It consists of various JPanels, JButtons, JTextFields, JLabels and JComboBoxes. The initialize method initializes the components and adds them to the frame. chooseCourse and enroll method are used for choosing a course and enrolling in it.

32. ViewTutorPage: The class contains various UI components such as JFrame, JPanel, JTable, JTextField, and JButton, among others. It also contains various methods such as initialize() which sets up the frame and creates UI components such as buttons and labels , table(), searchbibm() and searchbsc() methods create a table to display data and a text field with a search button to search for specific data respectively. The "main" method creates an object of the "ViewYutorPage" class and sets the visibility of the JFrame to "true".

33. ViewMarksPage: This class consists of a frame, panels, buttons, and labels. The initialize method sets up the frame, panel, and buttons, and sets their properties such as size, layout, background color, font, and action listeners. The main method invokes the class to display the GUI. The class also has methods level1, level2, and level3 which creates button for Level1, Level2 and Level3 respectively.

34. ViewMarks1Page: This class extends Details class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has three methods: initialize() which initializes the components of the frame, BscMarks that search and detail and marks of student studying bsc computer science in level 1 from the database in table, BibmMarks that search and displays the detail and marks of student studying bibm in level 1 from the database in the table. The class also has a main method which creates an instance of the class and makes the frame visible.

35. ViewMarks2Page: This class extends Details class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has three methods: initialize() which initializes the components of the frame, BscMarks that search and

detail and marks of student studying bsc computer science in level 2 from the database in table, BibmMarks that search and displays the detail and marks of student studying bibm in level 2 from the database in the table. The class also has a main method which creates an instance of the class and makes the frame visible.

36. ViewMarks3Page: This class extends Details class. The class consists of a frame and several panels, buttons, text fields, and a table. The class has three methods: initialize() which initializes the components of the frame, BscMarks that search and detail and marks of student studying bsc computer science in level from the database in table, BibmMarks that search and displays the detail and marks of student studying bibm in level 3 from the database in the table. The class also has a main method which creates an instance of the class and makes the frame visible.