University of Ruhuna- Faculty of Technology

Bachelor of Information and Communication Technology

ICT2132 - Object Oriented Programming Practicum

Final Report

Group - 08

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1. Introduction and Background.

Overview

Java is a cool programming language that's all about making things easy for everyone. It's like a magical toolbox for building all sorts of stuff on computers. You write your code once and it can work on any type of computer without having to change anything.

Imagine you're building a Lego castle. You don't want to build it differently just because you're using different colored Legos or a different kind of base plate, right? That's kind of like how Java works. You write your code (which is like building your castle), and then Java turns it into a special kind of code that any computer can understand.

The Learning Management System (TECMIS) is a desktop application that is designed to provide an efficient and user-friendly platform for the faculty of technology to manage various aspects of teaching and learning. The system is developed using Java and MySQL, and it offers a range of features that allow the faculty to manage user profiles, course details, student marks, attendance, notices, timetables, and medical records. The system is designed to cater to the needs of different users, including admins, lecturers, technical officers, and students.

JavaFX.

A software platform called JavaFX is used to develop and distribute desktop applications as well as rich web apps that can work on a range of devices. JavaFX is compatible with desktop PCs, web browsers running Microsoft Windows, Linux, and macOS, as well as iOS and Android-powered mobile devices.

JavaFX application is divided hierarchically into three main components known as Stage, Scene, and nodes. We need to import JavaFX. Application. class in every JavaFX application. This provides the following life cycle methods for JavaFX application.

- public void int()
- public abstract void start(Stage primary Stage)
- public void stop()

2. System Requirements.

The TECMIS is developed to meet the following requirements:

- **User Profiles**: The system should allow admins to create and maintain user profiles for different types of users, including lecturers, technical officers, and students.

- **Course Details**: The system should allow admins to create and maintain course details, including course materials, schedules, and assessments.

- **Student Marks**: The system should allow lecturers to upload and manage student marks for different types of exams.

- **Student Attendance**: The system should allow technical officers to manage and maintain student attendance records for different subjects.

- **Notices**: The system should allow admins to create and maintain notices related to courses, schedules, and other events.

- **Timetables**: The system should allow admins and technical officers to create and maintain timetables for different subjects and courses.

3. User Roles and Permissions.

The TECMIS offers different user roles and permissions, as follows:

- Admin: The admin user has full access to all features and functionalities of the system. The admin can create and maintain user profiles, courses, notices, and timetables.

- Lecturer: The lecturer user can update their profile, modify course materials, and upload student marks. The lecturer can also view student details, eligibility, attendance, medical records, and notices.

- Technical Officer: The technical officer user can update their profile, manage student attendance, and maintain medical records. The technical officer can also view notices and timetables.

- Student: The student user can update their contact details and profile picture. The student can view their attendance, medical records, course details, grades, GPA, timetables, and notices.

4. System Requirements.

The system was developed using Java programming language and the following tools and technologies:

- • Java Development Kit (JDK)
- • IntelliJ Environment (IDE)
- • MySQL Database Management System
- • JavaFX User Interface (UI) framework
- • Scene builder

5.System Features.

The Java Teaching and Learning Management System has the following features:

- User authentication and authorization
- Course creation and management
- Course enrollment and management
- Course content creation and management
- Course assignment creation and submission
- Course quiz creation and submission
- Course discussion forum
- User profile management
- System Implementation

The system was implemented using Java programming language and the JavaFX UI framework. The Eclipse IDE was used for coding, and the MySQL database was used for data storage and retrieval.

6. System Testing.

The system was tested using unit testing and integration testing techniques. The unit testing was done on individual modules of the system, while the integration testing was done on the system. The testing was done to ensure that the system meets the requirements and works as expected.

7. System Conclusion.

The Java Teaching and Learning Management System is a mini project that was developed to manage teaching and learning activities in an educational institution. The system provides features such as user authentication, course creation and management, course enrollment and management, course content creation and management, course assignment creation and submission, course quiz creation and submission, course discussion forum, and user profile management. The system was developed using Java programming language and the JavaFX UI framework, and the MySQL database was used for data storage and retrieval.

8. System Contribution.

Admin:

The administrator profile holds the highest level of access and control in the system. The responsibilities of the admin include:

a. User Profile Management:

The admin creates and maintains user profiles for all system users, including lecturers, technical officers, and students. This involves managing personal information, login credentials, and access privileges.

b. Course Management:

The admin creates and maintains courses offered by the institution. This includes adding course details such as name, description, and associated lecturers.

c. Notice:

The admin is responsible for creating and maintaining notifications to communicate important information to users. This can include announcements, updates, and reminders.

d. Schedule Management:

The admin creates and maintains schedules for courses, examinations, and other events. This ensures proper organization and coordination of activities within the institution.

Lecturer:

Lecturers play a crucial role in the educational process. Their responsibilities and access privileges include:

a. Profile Management:

Lecturers can update their profile information, excluding the username and password. This allows them to keep their personal details up to date.

b. Course Materials:

Lecturers can add and modify course materials, including lecture notes, assignments, and resources. They ensure that relevant and updated content is available to students.

c. Assessment and Grading:

Lecturers upload scores for various types of exams and assessments. They can view student details, eligibility, scores, grades, and GPA. This enables them to monitor student progress and academic performance.

d. Attendance:

Lecturers can view student attendance records to track student participation and identify any issues that may impact their performance.

Technical Officer:

Technical officers play a key role in managing administrative tasks related to student records and information. Their responsibilities include:

a. Profile Management:

Technical officers can update their profile information, similar to lecturers.

b. Attendance Management:

Technical officers collect and maintain student attendance details. They record student attendance and generate reports as required.

c. Medical Information:

Technical officers may collect and maintain student medical information. This includes recording medical records, allergies, and other health-related details for effective student support.

e. Timetables:

Technical officers can access and view departmental timetables, ensuring smooth scheduling of activities within their department.

Student:

Students have limited privileges within the system but can access important information related to their courses and personal details. Their functionalities include:

a. Profile Management:

Students can update their contact information and profile picture, ensuring their personal details are up to date.

b. Medical Details:

Students can access their medical records, including allergies, prescriptions, and other relevant information, ensuring their health and well-being is supported.

c. Course Details:

Students can view details of the courses they are enrolled in, including course names, descriptions, and associated lecturers.

d. Grades and GPA:

Students can view their grades and calculate their GPA based on their performance in different assessments. This allows them to monitor their academic progress.

e. Schedules:

Students can access their individual schedules, ensuring they are aware of class timings, exams, and other important events.