ACADEMY PROGRESS AUTOMATIC TRACKER

Project Report

Submitted by

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In partial fulfilment of the requirements for the award of

BACHELOR OF SCIENCE IN COMPUTER SCIENCE (HI)

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NISH

DEPARTMENT OF COMPUTER SCIENCE

NATIONAL INSTITUTE OF SPEECH & HEARING

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AUGUST 2023

CERTIFICATE

This is to certify that the project work entitled ***"Academy Progress Automatic Tracker"*** is a genuine and original record of the work conducted by **Mr. PUNYAT TRIPATHI, Registration Number: 16119163006**, a student of the National Institute of Speech & Hearing, Sreekaryam (P O), Thiruvananthapuram, from May 2023 to August 2023. This project has been undertaken as part of the partial fulfillment of the requirements for the award of a **BSc in Computer Science (HI)** from the University of Kerala.

Head of Department

Guide

Examiner

Date

August 22, 2023

Bengaluru

CERTIFICATE

This is to certify that **Punyat Tripathi, Register Number-** 16119163006, BSc (Computer Science) (HI) student of NISH, Akkulam, Thiruvananthapuram has done the project work on "**Academy Progress Automatic Tracker**" under the guidance of **Mr. Baskaran Arumugam**, Director – WinVinaya InfoSystems India Private Limited, 25/3 Brindavan, 3rd Cross, Saraswathi Puram, Huli Mavu Post, Bengaluru, Karnataka 560076, India towards the fulfilment of the award of BSc (Computer Science) (HI) from the University of Kerala during the period, May 2023 to August 2023.

Signature:

Name: Baskaran Arumugam

Seal

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I would like to extend my heartfelt appreciation to all those who made it possible for me to embark on and successfully complete this project.

I sincerely acknowledge the WinVinaya Foundation, located in Bengaluru, Karnataka, for entrusting me with this project and for their unwavering support and guidance throughout its development. I wish to express my gratitude to **Ms. Praba Karuppaiyan**, our dedicated guide from WinVinaya, for her timely suggestions and invaluable inputs. I am also deeply thankful to Vigneshwaran Rajagopal, Joshua (interpreter), and the entire team of staff, trainers, and interpreters at WinVinaya for their continuous support and guidance, which played a pivotal role in the completion of my work.

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Furthermore, I take this opportunity to express my deep sense of gratitude to **Ms. Raji Gopal**, Head of the Degree Program (HI), **Ms. Raji N R**, In-Charge of the Computer Science department, and all other esteemed faculty members for their valuable comments and guidance.

- **PUNYAT TRIPATHI**

ABSTRACT

The major backbone of any academic organisation are its students and their academic achievements. Constant monitoring of their progress is very vital in guiding them to achieve further. The objective of this project is to develop an application, ‘Academy Progress Automatic Tracker’ that regularly monitor the progress of students. This software application is designed to simplify and enhance the academic progress monitoring experience of students, teachers, and parents. The data is retrieved from Academy’s website academy's website and report is generated automatically. The generated reports are sent to teachers as email attachment. The interface is user friendly with required login facilities. Various modules modules such as the User Interface module, Selenium-Java Module, Apache POI Module, and Email Module and technologies are used for the efficient development of this software application.

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INTRODUCTION

1.1. BACKGROUND

The Academy Progress Automatic Tracker is a software application designed to simplify and enhance the academic progress monitoring experience for students, teachers, and parents. It automates data retrieval from the academy's website, provides user-friendly interfaces, and ensures secure login procedures. This project aims to improve user efficiency and data security within the academic environment.

1.2. OBJECTIVES

The major objectives of this application are:

TRACK CANDIDATE PROGRESS: The project aims to automate the process of tracking the progress of candidates belonging to a specific batch or group.

REDUCE MANUAL EFFORT: It intends to eliminate the need for manual effort in generating progress reports, indicating automation as a key goal.

ENSURE ACCURACY: The project focuses on improving the accuracy of progress reporting, suggesting that manual errors should be minimized.

FACILITATE REPORTING TO COORDINATORS: The ultimate objective is to provide a tool that allows trainers to efficiently and accurately report candidate progress to coordinators on a regular basis.

Overall, the project objective succinctly describes the purpose and expected outcomes of the Academy Progress Automatic Tracker application. It provides a clear direction for the development and implementation of the application.

SOFTWARE REQUIREMENT SPECIFICATION

The term "SRS" in this context stands for " Software Requirements Specification." In a systematic review study, information is gathered from the customer, who in this case is a trainer. The goal is to comprehensively understand the requirements for a specific purpose. This process involves collecting and analysing data from the trainer to gain insights into their needs and preferences. The information obtained from the systematic review study will be used to tailor solutions or approaches to meet the trainer's specific requirements effectively.

The STRUCTURE OF SOFTWARE REQUIREMENT SPECIFICATION includes

- Purpose
- Description
- Requirements
- Design Models
- Others

2.1. PURPOSE

The purpose of the Academy Progress Automatic Tracker is to provide teachers with a tool to automatically track and monitor their progress in an academy or educational institution. The system will allow students to manage their coursework, assignments, grades, and achievements in a centralized platform.

2.2. SCOPE

The system enables teachers to monitor the student academic-related information, track their performance over time, and receive insights into their progress. It will not be responsible for generating or managing official academic records.

2.3. FEASIBILITY STUDY

A feasibility study is done by a company when they want to know whether a project is possible.

- It checks if the new project should be accepted.
- To find out if a company has enough money for the project
- To find out if the new product being created will sell
- Or to see if there are enough human resources (employees) to do the project.
- A Feasibility Study determines if a project is worth doing.
- Once it has been determined that a project is feasible, the analyst can start to prepare the project specifications.

There are 3 types of feasibility study.

1. Technical Feasibility
2. Economic Feasibility
3. Operational Feasibility

1. Technical Feasibility -

Does the company have the technological resources (software, databases, etc.) to do the project?

If a new technology is needed, can it be developed?

2. Economic Feasibility –

Does the company have the finances or money to complete the project?

Will the company get profits in creating the system?

Are the costs of not creating the system so great that it is advisable to undertake the project?

3. Operational Feasibility –

This measures how well the Software will work after it is finished.

How people (users) will feel about it.

2.3.1. HARDWARE

Client side	Desktop / laptop
Processor/RAMs (Client Side)	4 GB (Minimum)
Processor/RAMs (Developer Side)	8 GB (Recommended)

2.3.2. SOFTWARE

Client side	Google Chrome or any browser
Developer Side	**Integrated Development Environment (IDE)** : Eclipse **Front end tools** : Java Swing **Backend tools** : Java, Apache **Operating System** : Windows

2.4. SYSTEM ANALYSIS

- Software requirements are gathered.
- Meetings are held to determine the requirements like;
    - Who is going to use the system?
    - How will they use the system?
    - What data should be input into the system?
    - What data should be output by the system?
- These requirements are then analyzed for their validity.
- Both functional and non-functional requirements are specified.
- Finally, a Software Requirement Specification (SRS) document is created.

This application is developed by meeting the trainers of WinVinaya training academy virtually. The present difficulties in dealing with the documents of the students were discussed.

2.4.1. FACT FINDING TECHNIQUES

1. Interviews: Conduct interviews with key stakeholders, including teachers, students, administrators, and coordinators, to understand their needs, expectations, and pain points related to progress tracking.

2. Questionnaires and Surveys: Distribute questionnaires or surveys to a wider audience to collect quantitative and qualitative data about the current progress tracking process and areas for improvement.

3. Observation: Observe how students and trainers currently track progress, including their interactions with the academy's website or portal, to identify bottlenecks and inefficiencies.

4. Document Analysis: Review existing documents, such as progress reports, tracking sheets, and communication records, to gain insights into the current manual tracking and reporting methods.

5. Prototyping: Create prototypes or mock-ups of the APAT interface and functionality and gather feedback from potential users to refine the design and features.

6. Competitive Analysis: Study similar tools or systems used in other educational institutions to identify best practices and features that could be incorporated into APAT.

7. SWOT Analysis: Perform a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis to assess the internal and external factors that may affect the success of APAT.

8. Feasibility Study: Conduct a feasibility study to determine the technical, operational, and economic feasibility of implementing APAT within the academy.

By employing a combination of these fact-finding techniques, we gathered comprehensive information and requirements for Academy Progress Automatic Tracker, ensuring that it aligns with the needs and expectations of its users and stakeholders.

2.4.2. DESCRIPTION: MODULES

The important modules of the application are

- UI Window Module
- Login Module
- Generate/Export Data Module
- Automatic Sending Emails Module
- Logout and Close of Academy Module

The Academy Progress Automatic Tracker is a group project with two team members. Each team member managed specific modules. The modules I handled are **Generate/Export Data Module** and **Automatic Sending Emails Module**.

2.4.2.1 UI WINDOW MODULE:

The UI Window module is the cornerstone of the Academy Progress Automatic Tracker project. This module serves as the graphical interface through which users interact with the application. It is the first point of contact between the user and the software. The UI Window is designed to be intuitive and user-friendly, ensuring that users can easily navigate and utilize the various features of the application.

The primary purpose of the UI Window is to create an environment that allows users to input relevant information and receive meaningful outputs. This includes options for selecting courses, setting tracking preferences, and viewing progress reports. The UI is designed with a focus on usability and aesthetics to enhance the overall user experience.

User interfaces often involve elements such as buttons, forms, and menus, which are all carefully designed and integrated into the UI Window. Additionally, the UI may incorporate visual cues and feedback mechanisms to guide users through the various steps of tracking their academic progress. Overall, the UI Window is a critical component that bridges the gap between the user and the underlying functionality of the application.

2.4.2.2 LOGIN ACADEMY:

The Login Academy module is responsible for streamlining the process of gaining access to the academy's online platform. It is a critical aspect of the Academy Progress Automatic Tracker as it automates the often repetitive and time-consuming login procedure.

The purpose of this module is to simplify user interactions by automatically filling in login credentials, such as usernames and passwords, and then submitting them to the academy's website. It ensures that users can swiftly access their academic accounts without the need for manual input each time they use the application. This not only saves time but also reduces the risk of errors that can occur during manual login attempts.

In addition to user convenience, the Login Academy module enhances security by securely storing login credentials and ensuring they are transmitted in a protected manner. It adheres to best practices in authentication and authorization to safeguard user data and accounts.

2.4.2.3 GENERATE/EXPORT DATA:

The Generate/Export Data module plays a pivotal role in the Academy Progress Automatic Tracker by automating the collection and exportation of critical progress data from the academy's website or portal.

This module is designed to retrieve data such as grades, course completion status, upcoming assignments, and other pertinent information. It does so by simulating user actions on the academy's website, navigating to relevant pages, extracting data, and structuring it in a usable format. The structured data can then be saved, displayed to the user, or exported in formats like CSV or Excel for further analysis or reporting purposes.

The primary objective of this module is to eliminate the need for users to manually gather and organize their academic progress data. By automating this process, it not only saves time but also reduces the chances of errors that can occur when data is manually transcribed. Furthermore, this module ensures that users have access to up-to-date information about their academic progress at their fingertips.

2.4.2.4 AUTOMATIC SENDING EMAILS:

The Automatic Sending Emails module is a powerful communication tool within the Academy Progress Automatic Tracker. It is designed to automate the process of sending email notifications, progress reports, or updates to users or relevant parties.

This module enables users to configure email settings, recipients, and trigger conditions. Once configured, it can automatically generate and send emails based on predefined events or schedules. For example, it can send weekly progress reports, alert users about upcoming exams, or notify guardians about their child's academic performance.

The key purpose of this module is to enhance communication and convenience for users. It ensures that users stay informed about their academic progress without actively checking the application. Additionally, it can foster collaboration and communication between students, teachers, and parents by providing timely updates.

2.4.2.5 LOGIN MODULE:

The "Logout and Close of Academy" module is a crucial component of the Academy Progress Automatic Tracker project. This module is responsible for ensuring the secure termination of the user's session on the academy's website or portal and closing the academy's web application gracefully.

LOGOUT FUNCTIONALITY:

The primary purpose of the "Logout" part of this module is to automate the process of logging the user out of their academy account. After users have completed their tasks within the Academy Progress Automatic Tracker, they can initiate the logout process through this module. When triggered, the module simulates user actions to navigate to the logout button or link on the academy's website and confirms the logout.

The significance of this functionality lies in enhancing security and privacy. Logging out of the academy's platform ensures that the user's account remains inaccessible to unauthorized individuals, even if the device is shared or left

unattended. This security measure aligns with best practices and privacy regulations, promoting the responsible handling of user data.

EXITING ACADEMY WEB APPLICATION:

In addition to logging out, the "Close Academy Web Application" component of this module ensures the proper closure of the academy's web application window or tab. This is particularly important in scenarios where the Academy Progress Automatic Tracker has opened a separate browser window or tab to interact with the academy's platform.

The purpose of this functionality is to provide a seamless user experience. By automatically closing the academy's web application, the module helps users avoid clutter and confusion in their web browser, ensuring that unnecessary tabs or windows are not left open. It also contributes to system resource management, optimizing the performance of the user's device.

2.4.3 REQUIREMENTS: Functional & Non-functional

2.4.3.1 FUNCTIONAL TESTING

1) USER MANAGEMENT

- Verify that user registration, login, and profile management functions correctly.
- Test password reset and account recovery features.

2) ACADEMY PROGRESS TRACKING

- Validate the accuracy of progress calculations for students across various courses and modules.
- Verify that progress updates occur as expected based on user interactions.

3) COURSE MANAGEMENT

- Test the creation, modification, and deletion of courses by administrators.
- Ensure that course details are displayed accurately.

4) STUDENT PROGRESS MANAGEMENT

- Verify that trainers can update and monitor individual student progress

records.

- Test scenarios involving different course completion levels.

5) TRAINER/ADMINISTRATOR DASHBOARD

- Validate the functionality of dashboards for trainers and administrators.

- Ensure that they can access and update student and course information.

6) REPORTING AND ANALYTICS

- Verify that the reporting and analytics features generate accurate insights.

- Test the export and visualization of data.

2.4.3.2 NON-FUNCTIONAL TESTING

1) PERFORMANCE TESTING

- Assess system response times under normal and peak load conditions.

- Evaluate database performance, server load, and response times during data retrieval.

2) SECURITY TESTING

- Test user authentication and authorization mechanisms.

- Conduct vulnerability assessments and penetration testing.

- Ensure data encryption during transmission and storage.

3) USABILITY TESTING

- Evaluate the user interface for ease of navigation and clarity.

- Collect feedback from users on usability improvements.

4) RELIABILITY TESTING

- Verify that the application functions reliably without unexpected crashes or downtime.

- Perform stress testing to assess system behaviour under extreme loads.

5) MAINTAINABILITY TESTING

- Assess the ease of maintaining and updating the software.

- Ensure that changes or updates do not introduce new defects.

6) SCALABILITY TESTING

- Test the system's ability to handle increased data and user loads.

- Verify that scaling mechanisms work as expected.

2.5 PROJECT SCHEDULING

2.5.1 TIME PLAN

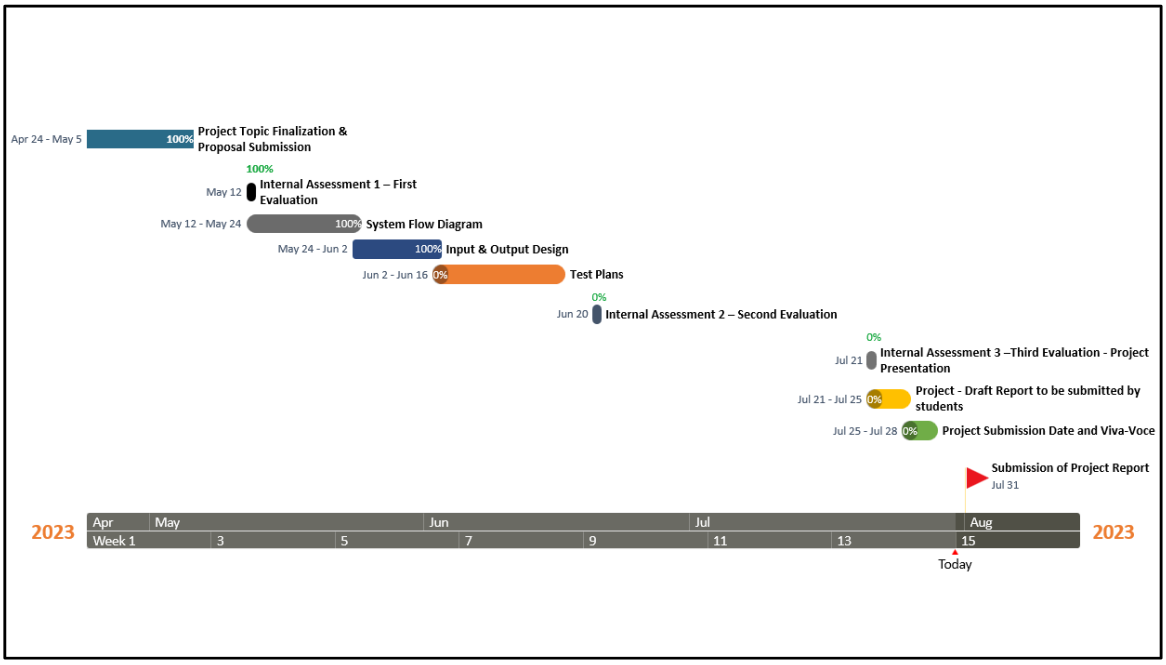
SCHEDULE		**APRIL – AUGUST 2023**
SL NO	**EVENT**	**DATE & DAY**
1	Project Topic Finalization & Proposal Submission	May 5,2023 Friday
2	First Evaluation SRS, Program Flow Diagram	May 12, 2023 Friday
3	System Flow Diagram	May 24, 2023 Wednesday
4	Input & Output Design	June 2, 2023 Friday
5	Test plans	June 16, 2023 Monday
6	Second Evaluation	June 20, 2023 Thursday
7	Third Evaluation - Project Presentation	July 21, 2023 Friday
8	Project - Draft Report to be submitted by students to respective Guide	July 25, 2023 Monday
9	Project Submission Date and Viva-Voce	July 28, 2023 Friday
10	Submission of Project Report	July 31, 2023 Monday

2.5.2 GANTT CHART

Gantt charts are useful for planning and scheduling projects. They help you assess how long a project should take, determine the resources needed, and plan the order in which the tasks will be completed. Gantt charts are horizontal bar charts.

A Gantt chart is a visual view of tasks scheduled over time. They are a useful way of showing what work is scheduled to be done on a specific day. They also show the start and end dates of a project in one simple view.

Time is generally on the horizontal axis and the activities are arranged vertically, from top to bottom, in the order of their start dates. Gantt charts are used to report progress

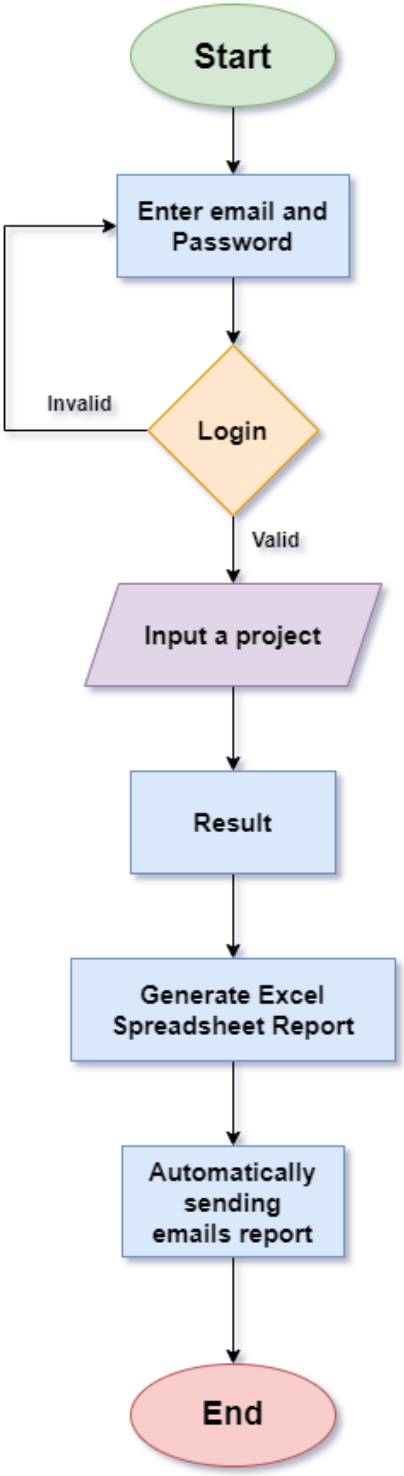


2.6 SYSTEM DESIGN

The software design is prepared from SRS.

Software design includes

2.6.1. WORKFLOW



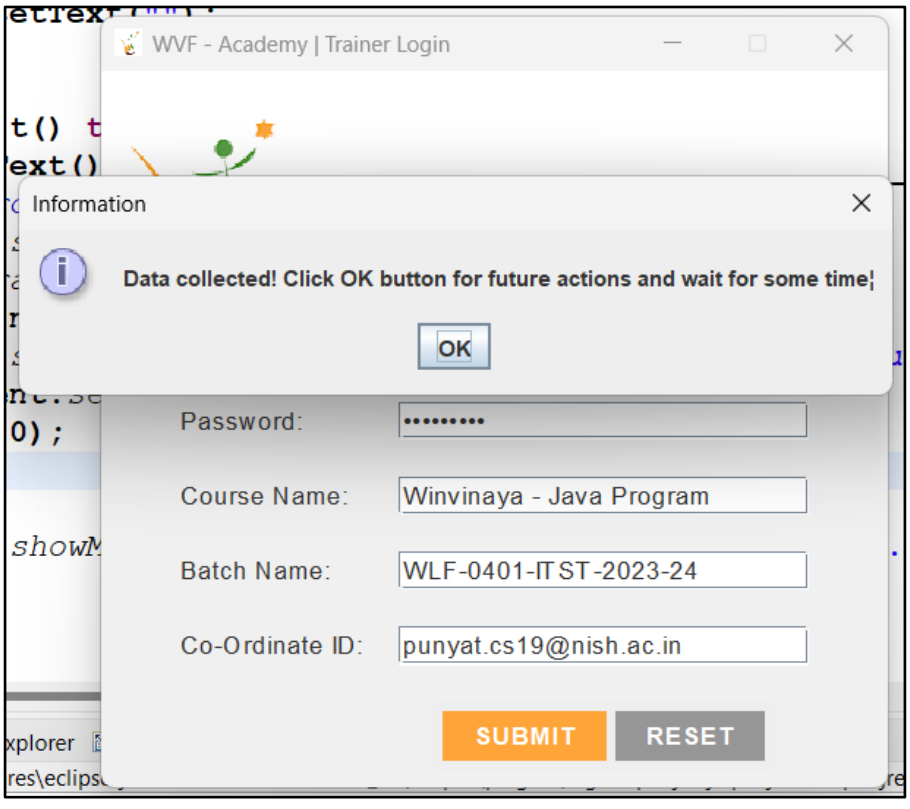
2.6.2. SCREEN DESIGNS

LOGIN SCREEN USING JAVA SWING

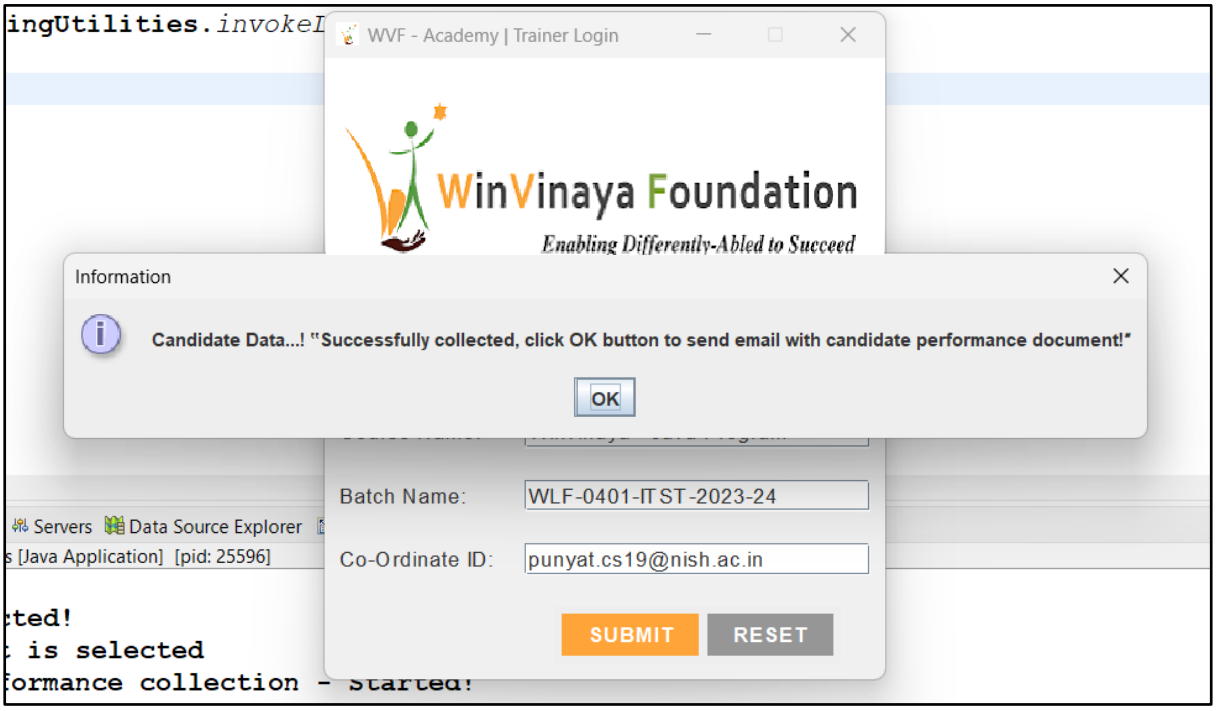
VALIDATION MESSAGES

LOGIN ENTRY

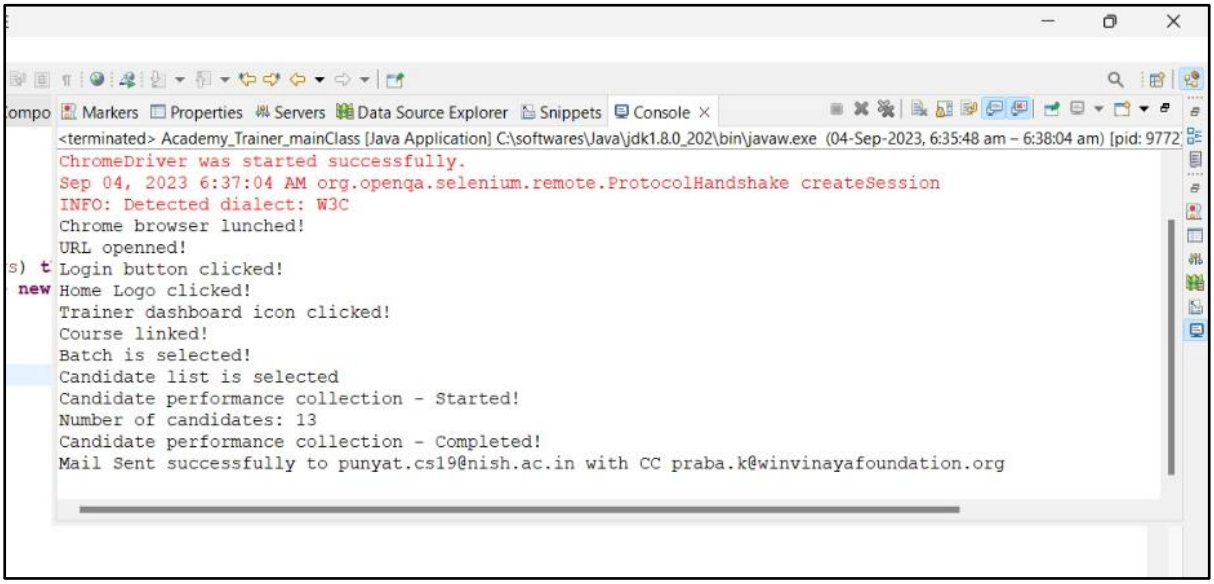
DATA COLLECTION AFTER INPUT SUBMISSION



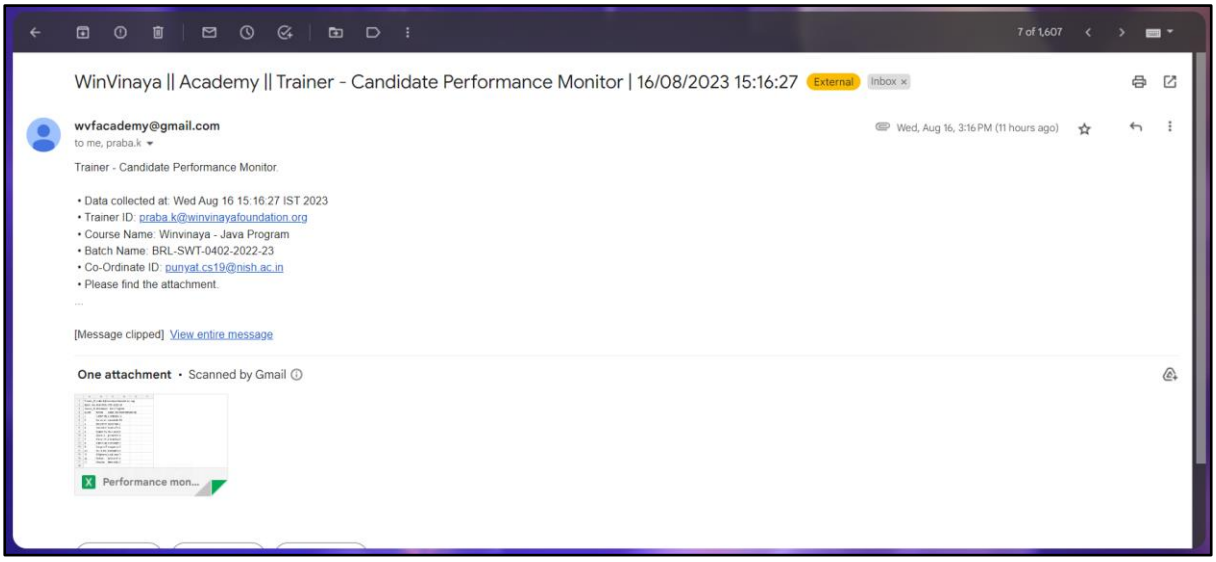
EMAIL CONFIRMATION SCREEN



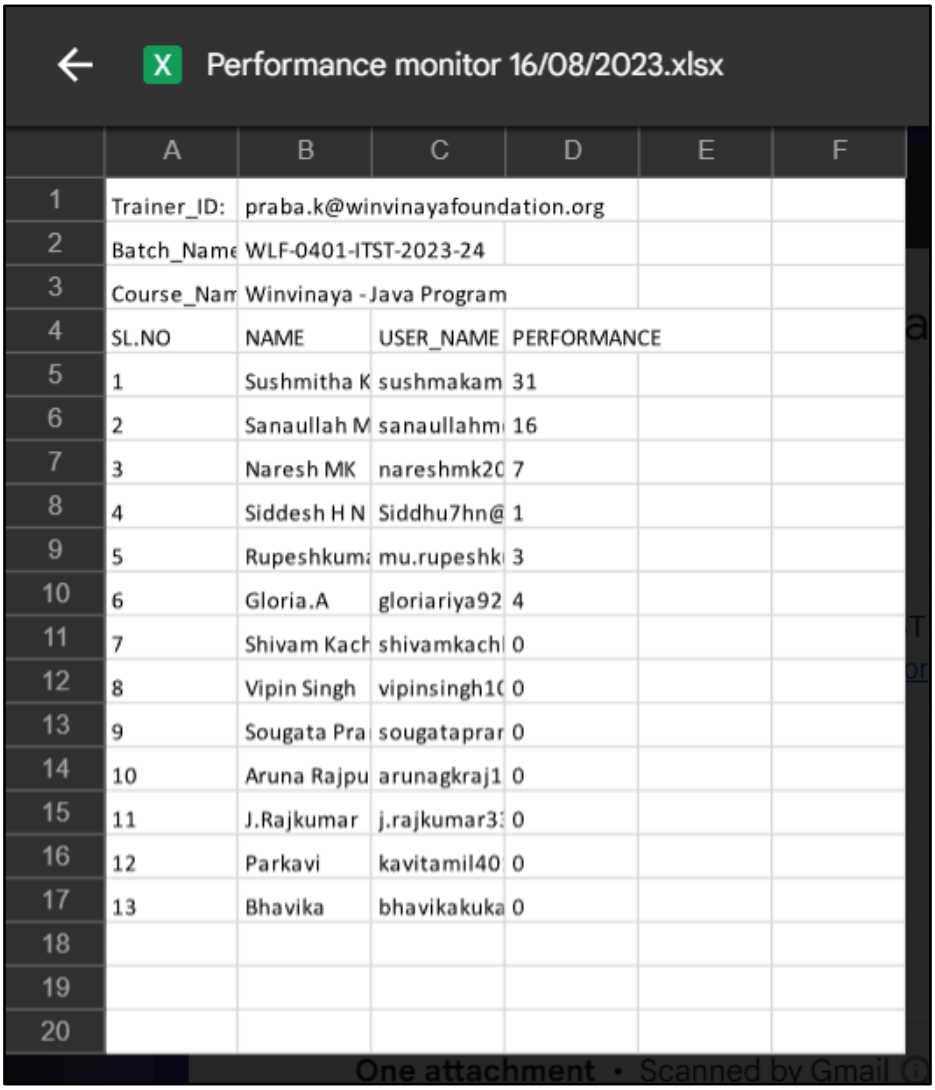
ECLIPSE CONSOLE



WINVINAYA ACADEMY INBOX SCREENSHOT



EXCEL FILE



2.7. TEST PLANS

Test ID	Test case	Test data	Expected result	Actual result	Status
1.	Click on the login button without entering the login ID, password, course name, batch name, or coordinate ID.	**Login ID** – " " **Password** – " " **Course Name** – " " **Batch Name** – " " **Co-Ordinate ID** – " "	It will display the message "Please enter all data."		
2.	Click on the login button without specifying fields.	**Login ID** – praba.k@winvinayafoundation.org **Password** – " " **Course Name** – Winvinaya - Java Program **Batch Name** – " " **Co-Ordinate ID** – punyat.cs19@nish.ac.in	It will display the message "Please enter all data."		
3.	Click on the login button with all fields.	**Login ID** – praba.k@winvinayafoundation.org **Password** – winvinaya **Course Name** – Winvinaya - Java Program **Batch Name** – WLF-0401-ITST-2023-24 **Co-Ordinate ID** – punyat.cs19@nish.ac.in	It will allow the user to log in.		

TEST REPORTS

Test ID	Test case	Test data	Expected result	Actual result	Status
1.	Click on the login button without entering the login ID, password, course name, batch name, or coordinate ID.	**Login ID** – " " **Password** – " " **Course Name** – " " **Batch Name** – " " **Co-Ordinate ID** – " "	It will display the message "Please enter all data."	The message displayed is "Please enter all data."	Pass
2.	Click on the login button without specifying fields.	**Login ID** – praba.k@winvinayafoundation.org **Password** – " " **Course Name** – Winvinaya - Java Program **Batch Name** – " " **Co-Ordinate ID** – punyat.cs19@nish.ac.in	It will display the message "Please enter all data."	The message displayed is "Please enter all data."	Pass
3.	Click on the login button with all fields.	**Login ID** – praba.k@winvinayafoundation.org **Password** – winvinaya **Course Name** – Winvinaya - Java Program **Batch Name** – WLF-0401-ITST-2023-24 **Co-Ordinate ID** – punyat.cs19@nish.ac.in	It will allow the user to log in.	Login successful	Pass

CONCLUSION

In conclusion, the project accomplished its primary objective of creating candidate progress reports and transmitting them to a designated project coordinator. The user friendliness of the application helps the user to access the application as and when required. The other modules that can be linked to this application are student registration and data analytics modules. As later modules these can be considered for development.

FUTURE SCOPE OF THE PROJECT

The future scope of the Academy Progress Automatic Tracker (APAT) project is expansive and holds significant potential for growth and improvement. While the current version of APAT successfully automates progress tracking and reporting, there are numerous avenues for enhancement.

These include the integration of additional features, such as assignment submission and course enrolment, to create a more comprehensive academic management tool. Advanced data analytics can provide deeper insights into student progress, and predictive analytics can help identify at-risk students early for timely interventions.

Mobile application compatibility and AI-powered insights can further increase accessibility and personalization. Security measures will be continuously improved to protect user data and ensure compliance with evolving privacy regulations. Feedback mechanisms and user-driven development will play a crucial role in refining the application.

The future also holds the possibility of expanding APAT's usage to support multiple educational institutions, incorporating gamification elements, offering multilingual support, transitioning to cloud-based storage, and providing comprehensive user training and support.

By embracing these opportunities, APAT can remain at the forefront of academic progress tracking, enhancing the educational experience for all stakeholders.

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