FYP Management System

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Abstract

Efficiently managing final year projects within the Department of Computer Science at UET Lahore is essential for ensuring smooth operations and successful project outcomes. Presently, reliance on spreadsheets for project management introduces inefficiencies and the potential for errors. To address these challenges, a desktop application using C is proposed to centralize and streamline project management processes.

This application will serve as a comprehensive platform for committee members to oversee students, advisors, and projects, facilitating tasks such as student grouping and project assignment. Additionally, it will support assigning multiple advisors to projects and managing evaluations, with further enhancements tailored to the committee's needs.

In addition to simplifying project management tasks, the application will generate informative reports in PDF format. These reports will include detailed project listings with advisory board information and student rosters, as well as project-specific mark sheets highlighting evaluation results. By enhancing efficiency and accuracy, this project aims to elevate the final year project management experience for all stakeholders involved.

Contents

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1 Problem Statement

The problem of *inefficient project management* in academic institutions persists due to the lack of a centralized system for managing student projects, advisors, and evaluations. Existing methods often rely on manual processes, spreadsheets, or disjointed systems, leading to challenges such as difficulty in project allocation, tracking progress, and evaluating outcomes. Additionally, communication gaps between administrators, advisors, and students further exacerbate these issues, resulting in delays, miscommunications, and inefficiencies. Therefore, there is a critical need for a comprehensive and integrated solution that streamlines project management processes, enhances collaboration, and improves transparency in academic project management.

2 Project Outline

2.1 Users

The project will be used by the following stakeholders:

- Advisors: Assist students in selecting projects, providing guidance, and evaluating project progress.
- Students: Engage in project selection, collaboration, execution, and evaluation.

2.2 Where it Can be Used

The project can be utilized in various academic settings, including:

- Universities: To facilitate undergraduate and graduate project management in different disciplines.
- Colleges: For managing capstone projects, research initiatives, and group assignments.
- High Schools: To organize student projects, mentorship programs, and extracurricular activities.

3 Project Domain

The project falls within the domain of *academic project management*. It aims to address the challenges associated with managing student projects, advisor interactions, and project evaluations within educational institutions. By providing a centralized platform for project allocation, tracking, and evaluation, the project seeks to streamline administrative processes, enhance collaboration between stakeholders, and improve the overall efficiency and effectiveness of academic project management. Additionally, the project domain extends to areas such as student engagement, mentorship, and skill development, contributing to the holistic educational experience of students.

4 Project Idea

The project aims to develop a comprehensive *academic project management system* for educational institutions. This system will provide a centralized platform for administrators, advisors, and students to manage all aspects of student projects, including project selection, allocation, tracking, evaluation, and collaboration. Through intuitive interfaces and robust functionality, the system will streamline administrative processes, enhance communication and collaboration among stakeholders, and improve the overall efficiency and effectiveness of managing academic projects.

5 Project Motivation

The motivation behind this project stems from the challenges and inefficiencies inherent in current academic project management practices. Existing methods often rely on manual processes, spreadsheets, or disjointed systems, leading to difficulties in project allocation, tracking, and evaluation. Communication gaps between administrators, advisors, and students further exacerbate these issues, resulting in delays, miscommunications, and inefficiencies. By developing a comprehensive project management system, we aim to address these challenges and provide a solution that simplifies project management, enhances collaboration, and improves transparency in academic project management.

6 Technical Details

6.1 Development Environment

The project is developed using Microsoft Visual Studio, a popular integrated development environment (IDE) for C programming. Visual Studio provides a rich set of tools for building desktop applications and offers extensive support for WinForms development.

6.2 Programming Language

The project is implemented using C, a versatile and powerful programming language provided by Microsoft. C is well-suited for developing desktop applications and offers features such as object-oriented programming, type safety, and easy integration with other .NET technologies.

6.3 User Interface

The user interface of the project is built using WinForms, a graphical user interface (GUI) framework provided by Microsoft. WinForms allows developers to create rich and interactive UIs for Windows-based applications using drag-and-drop design tools and event-driven programming.

6.4 Database Integration

The project integrates with a relational database management system (RDBMS) to store and manage data. Microsoft SQL Server is used as the backend database, and the project utilizes ADO.NET for database connectivity. ADO.NET provides a set of classes and libraries for accessing and manipulating data in the database.

6.5 Data Access Layer

The project follows a layered architecture, with a dedicated data access layer (DAL) responsible for interacting with the database. The DAL encapsulates database operations such as querying, inserting, updating, and deleting data, providing a separation of concerns and facilitating code maintainability and scalability.

6.6 Authentication and Authorization

Authentication and authorization mechanisms are implemented using .NET Framework's built-in security features. User credentials are securely stored and validated against the database, and role-based access control (RBAC) is used to restrict access to specific functionalities based on user roles (e.g., administrator, student).

6.7 Error Handling and Logging

The project includes robust error handling and logging mechanisms to ensure smooth operation and troubleshooting. Exception handling techniques are employed to catch and handle errors gracefully, while logging frameworks such as NLog or log4net are used to record error messages and diagnostic information for analysis and debugging.

7 Empowering Technologies: Languages and Libraries

7.1 Languages

- C: Used for desktop application development.
- SQL: Utilized for database interaction and querying.
- LaTeX: Employed for report creation.

7.2 Libraries and Modules

- Windows Forms: Utilized for creating the graphical user interface of the desktop application.
- .NET Framework: Framework employed for building Windows applications.
- SQL Server Management Studio: Tool for managing and querying SQL databases.
- iTextSharp: Library for PDF document creation and manipulation in C#.

8 Project Functional Details

8.1 Login Menu

The login menu provides authentication for users, including administrators and students. Users enter their credentials (e.g., username and password) to access the system.

8.2 Admin Menu

The admin menu offers a range of functionalities for administrators:

- Add Student: Allows administrators to add new students to the system by entering their details.
- Add Advisor: Enables administrators to add new advisors along with their information.
- Add Project: Allows administrators to add new projects to the system, specifying details such as project title, description, and requirements.
- Make Group: Facilitates the creation of student groups for collaborative projects or activities.
- Evaluate Group: Provides tools for administrators to evaluate group projects based on predefined criteria.
- Determine Project Marks and Weightage: Allows administrators to set marks and weightage for projects, which are used in evaluation.
- Assign Project to Advisor: Enables administrators to assign projects to specific advisors based on their expertise.
- Assign Project to Group of Students: Allows administrators to allocate projects to groups of students for collaborative work.
- View All Data: Provides administrators with access to all system data, including student, advisor, and project records.
- Generate Reports: Enables administrators to generate comprehensive reports on various aspects of the system, such as project status, advisor assignments, and evaluation outcomes.

8.3 Student Menu

The student menu offers specific functionalities for students:

- View Details: Allows students to view their personal details stored in the system.
- View Marks: Enables students to see their project marks and evaluations.
- View Assigned Advisor: Provides students with information about their assigned advisor.
- View Assigned Projects: Allows students to view the projects they have been assigned to work on.

9 Use cases

9.1 Advisor Menu

Function	Advisor Access
User	Advisor
Explanation	The advisor menu provides access to essential functionalities for efficiently managing the system, ensuring smooth operation and effective coordination throughout the project management process. It includes features such as entering student information, assigning students to groups, supervising project advisors, and managing projects.
Flow	1. The advisor logs into the system and accesses the advisor menu. 2. The advisor selects the desired functionality from the advisor menu. 3. The advisor manages student information, ensuring accuracy. 4. The advisor efficiently creates and manages student groups. 5. The advisor supervises projects, assigns advisors, and tracks progress. 6. The advisor assigns evaluation IDs and monitors assessment results. 7. The advisor generates various reports for project analysis.

9.1.1 Add Student

Function	Student Data Management
User	Advisor
Explanation	Advisors can add and modify student information, including Registration Number, First Name, Last Name, Gender, Date Of Birth, Email, and Phone Number. The process prioritizes authentication, ensuring that only new students are added to the system.
Flow	1. When the advisor accesses the ”Add student” form, existing student data is displayed. 2. The advisor clicks the ”ADD” button to initiate the addition process. 3. A form appears with text boxes and dropdown menus to input student details, including: • Registration Number • First Name • Last Name • Gender • Date Of Birth • Email • Phone Number 4. Authentication ensures that only students not previously added are included in the process.

9.1.2 Add Advisor

Function	Advisor Addition
User	Advisor
Explanation	The ”Add Advisor” feature enables advisors to input advisor details via a form. Upon validation, the system adds the advisor to the database and displays a confirmation message for successful addition, visible in the advisor list for verification.
Flow	1. The advisor selects ”Add Advisor” from the advisor menu. 2. The advisor fills out the form with advisor details such as name, designation, and salary. 3. The system validates the entered information to ensure accuracy. 4. If the information is valid, the system adds the advisor to the database. 5. The advisor receives a confirmation message indicating the successful addition of the advisor. 6. The advisor can now view the newly added advisor in the advisor list.

9.1.3 Add Projects

Function	Project List Addition
User	Advisor
Explanation	The ”Add Project List” feature empowers advisors to input new project details accessible to student groups. Advisors initiate this process from the project management section by entering the project title and description.
Flow	1. The advisor accesses the project management functionality from the advisor menu. 2. The advisor selects the option to add a new project list. 3. The advisor provides the necessary details for the new project, such as title and description. 4. The system validates the input and automatically generates a unique project ID. 5. The advisor confirms the addition of the project list. 6. The system adds the new project list to the database. 7. The advisor receives a confirmation message indicating the successful addition.

9.1.4 Assign Project

Function	Project Assignment
User	Advisor
Explanation	In the ”Assign Project” process, advisors select a project from a list and choose a student group to assign it to. Upon confirmation, the system updates the database and notifies the advisor, simplifying project allocation and promoting collaboration.
Flow	1. The advisor initiates the ”Assign Project” process from the advisor menu. 2. The system presents a list of available projects along with their details, such as title and description. 3. The advisor selects a project from the list to assign to a student group. 4. The system displays a list of student groups along with their details, such as group ID and members. 5. The advisor selects the student group to which they want to assign the chosen project. 6. After confirming the assignment, the system updates the database to reflect the project assignment to the selected student group. 7. Finally, the system notifies the advisor that the project has been successfully assigned to the chosen student group.

9.1.5 Assign Advisor

Function	Advisor Assignment
User	Advisor
Explanation	Advisors access the ”Assign Advisor” feature from the menu, select a project, choose advisors with specific roles, and confirm the assignment. The system updates the database and notifies the advisor, facilitating efficient project supervision with the option for review and adjustments.
Flow	1. The advisor logs into the system and accesses the advisor menu. 2. From the advisor menu, the advisor selects the ”Assign Advisor” functionality. 3. The system displays a list of available projects awaiting assignment of advisors. 4. The advisor selects a project from the list. 5. The system presents a list of available advisors along with their respective roles (main advisor, co-advisor, industry advisor). 6. The advisor selects one or more advisors for the chosen project, specifying their roles. 7. The system assigns the selected advisors to the project and updates the database accordingly. 8. The advisor receives a confirmation message indicating successful advisor assignment. 9. The advisor can review the assigned advisors for each project and make adjustments if necessary.

9.1.6 Group Formation

Function	Group Creation
User	Advisor
Explanation	Creating groups enables effective project management. Advisors input group details such as name, associated project, and student IDs. After validation and confirmation, the system stores the group information, ensuring accurate management and promoting collaboration.
Flow	1. The advisor selects ”Create Groups” from the advisor menu. 2. The system displays a form to input group details. 3. The advisor enters group information such as the group name, project details, and student IDs. 4. The system validates the input and generates a unique group ID. 5. The advisor confirms the creation of the group. 6. The system saves the group information in the database. 7. The advisor receives a confirmation message of successful group creation.

9.1.7 Add Evaluation

Function	Evaluation Addition
User	Advisor
Explanation	In the Evaluation Management section, advisors can add new evaluations by inputting details such as the name, total marks, and weightage. Once submitted, the system assigns a unique ID to the evaluation, which is then confirmed by the advisor. This added evaluation is now available for assignment to student groups, simplifying the assessment process.
Flow	1. The advisor accesses the advisor menu and selects ”Evaluation Management.” 2. The advisor chooses ”Add Evaluation” from the options. 3. The advisor fills out the necessary details for the evaluation, such as name, total marks, and total weightage. 4. The system generates a unique evaluation ID for the new evaluation. 5. The advisor confirms the addition of the evaluation. 6. The evaluation is now available for assigning to student groups.

9.1.8 Mark Evaluation

Function	Group Evaluation
User	Advisor
Explanation	In the Evaluation Management section, advisors efficiently assess group performance by assigning marks and providing feedback, ensuring fair evaluation of projects.
Flow	1. The advisor accesses the Evaluation Management section from the advisor menu. 2. The advisor selects the group to evaluate, assigns marks, and submits the evaluation form.

9.1.9 Generate Reports

Function	Report Generation
User	Advisor
Explanation	”Generate Reports” provides advisors with critical project insights through PDF reports retrieved from the database. These reports support informed decision-making and optimization of project management processes.
Flow	1. The advisor accesses the ”Generate Reports” option from the advisor menu. 2. The system presents various report options to the advisor. 3. The advisor selects the desired report type, such as lists of tasks assigned to supervisors, supervisors assigned to students, students not yet assigned to a group, lists of students in each group, or marks sheets for each project. 4. The system compiles the requested data from the database. 5. Reports are generated in PDF format for easy viewing and sharing. 6. The advisor can download or view the generated reports. 7. The advisor can analyze the reports to gain insights into project management, student progress, and overall performance.

9.2 Student Menu

Function	Student Access
User	Student
Explanation	Students can access their menu to view personal details, assigned projects, group information, group members, and marks.
Flow	1. Student opens the menu. 2. A 'Login' window appears. 3. The student enters their registration number. 4. After entering the registration number and clicking the 'save' button, the application verifies the information. 5. If the information matches an account, the student is directed to their respective dashboard. 6. If the details do not match any account, a message appears indicating that the provided information is incorrect.

9.2.1 View Student Data

Function	View Student Data
User	Advisor
Explanation	Students utilize "View Student Data" to access student information, enabling easy navigation and management of student records.
Flow	1. The advisor selects "View Student Data" from the Advisor menu. 2. The system retrieves student information from the database. 3. The Advisor interface displays a list of all students registered in the system. 4. Each student entry includes details such as name, contact information, and email address.

9.2.2 View Marks

Function	View Current Marks
User	Student
Explanation	The ”View Current Marks” feature enables users to review marks achieved by student groups in evaluations. The system presents the data in a user-friendly format with filtering options, enhancing analysis and decision-making.
Flow	1. The user navigates to the ”View Current Marks” section of the application interface. 2. The system retrieves the relevant data from the database, including evaluation IDs, group IDs, and corresponding marks. 3. The data is processed and presented in a user-friendly format on the screen. 4. Users can view the current marks of each group for their respective evaluations.

9.2.3 View Assigned Projects

Function	View Assigned Projects
User	Student
Explanation	Students can view the assigned projects which they are supposed to complete.
Flow	1. The student navigates to the student menu and selects the ”Groups” option. 2. The system retrieves and displays a list of all desired data.

9.2.4 View Assign Advisor

Function	View Assigned Advisors
User	Student
Explanation	Students can view the advisors assigned to the project they are involved in.
Flow	1. The student navigates to the student menu and selects the ”View Advisors” option. 2. The system retrieves and displays a list of all advisors assigned to the particular student’s project.

9.2.5 View Group and Group Members

Function	View Assigned Group and Group Members
User	Student
Explanation	Students can view the group and its members assigned to the project they are involved in.
Flow	1. The student logs into the system and navigates to the Student menu. 2. From the Student menu, the student selects the ”View Group” option. 3. The system displays the group assigned to that student. 4. The system retrieves and displays the members of the group.

10 User Interfaces

Bridging users and software seamlessly through intuitive design and interactive elements, enhancing user experience and facilitating efficient interaction with the system.

Figure 1: Main Admin Menu

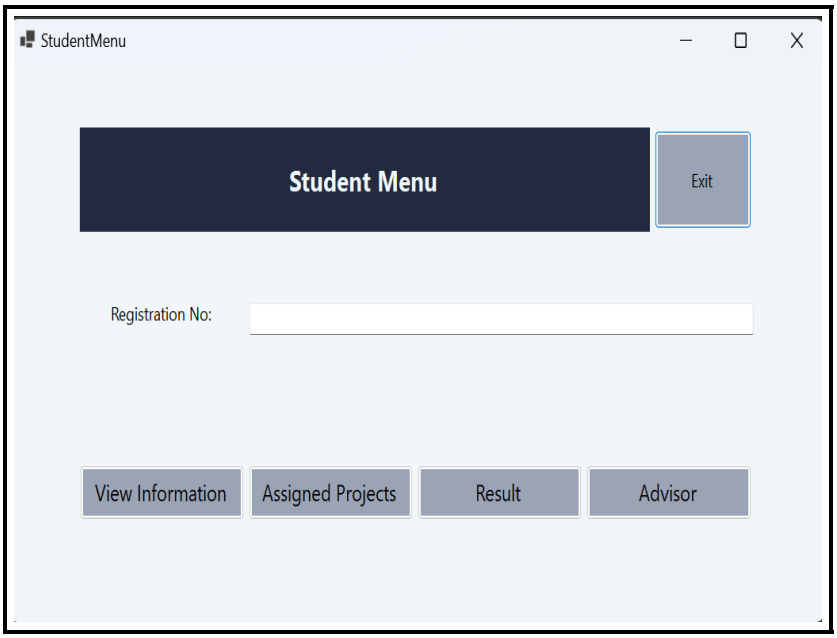

Figure 2: Main Student Menu

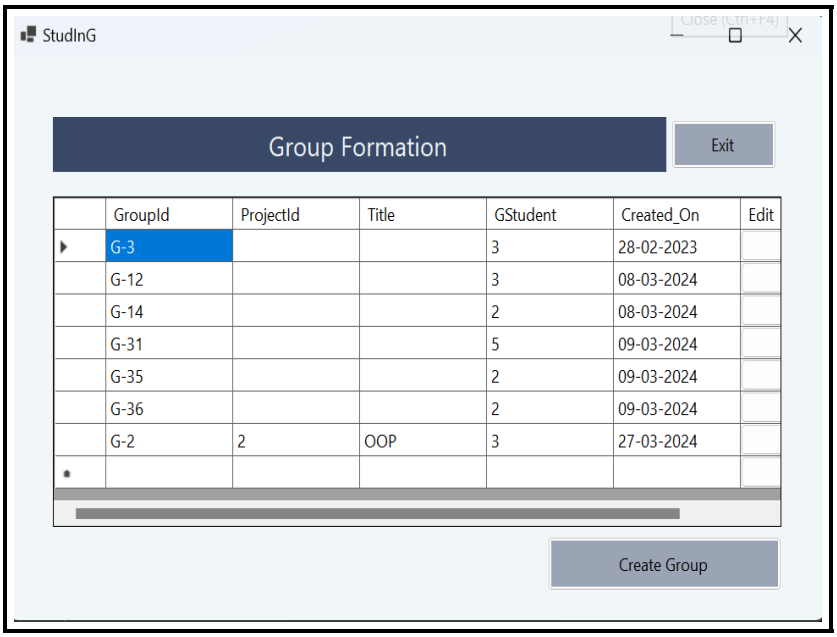

Figure 3: Group Formation

16

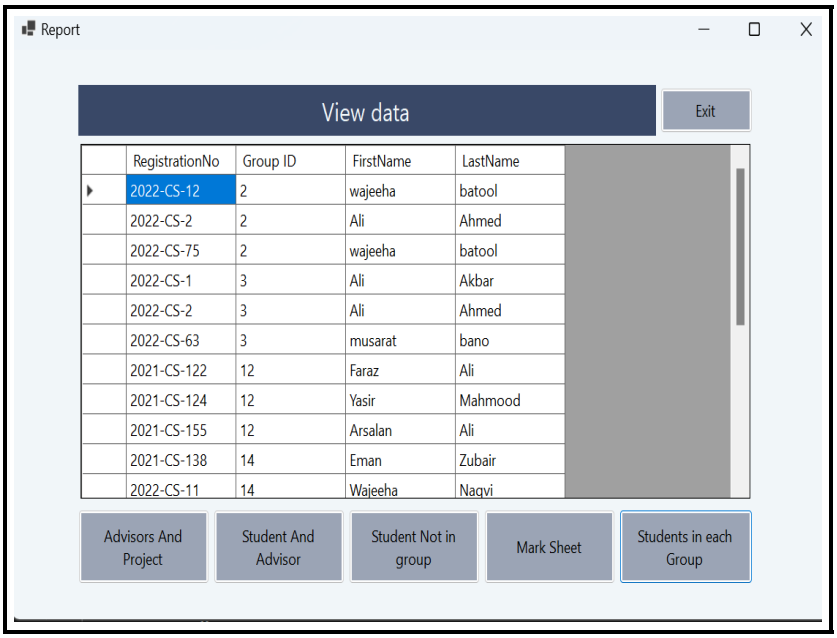

Figure 4: View All Data

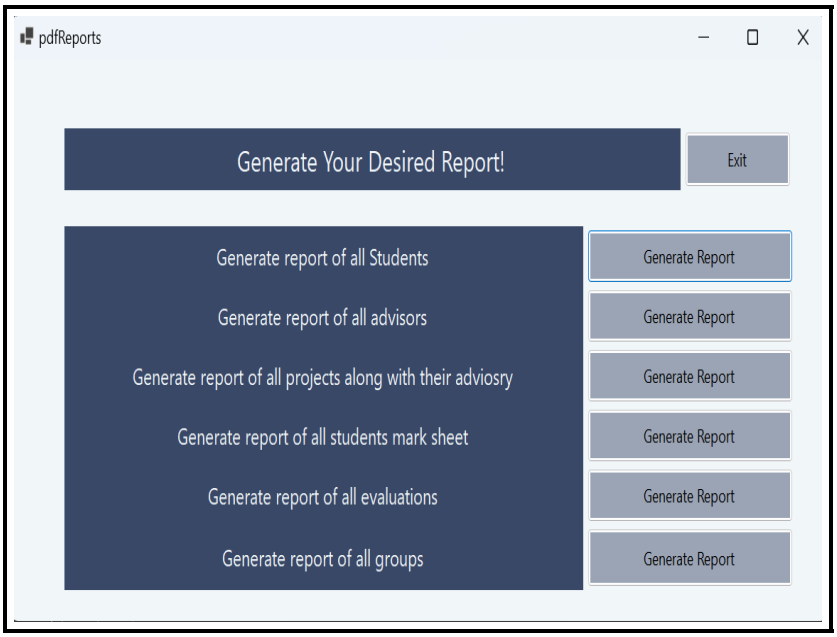

Figure 5: Pdf Report Generation

17

11 Gitlab Repository Link

https://gitlab.com/gulezahrasyeda980/dbmidproject-2022-cs-75

12 Conclusion

In essence, the development of a desktop application tailored for overseeing final year projects within the Department of Computer Science at UET Lahore aims to streamline and contemporize the conventional manual procedures. By providing a centralized hub for managing students, advisors, projects, and assessments, the application adheres to the guidelines set forth by the committee. This innovative tool is poised to elevate project management efficacy, mitigate inaccuracies, and elevate the satisfaction levels of all stakeholders involved in the process.