

***FINAL ASSESSMENT PROJECT***

***(40 total points)***

## Module Details

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| **Module Code** | UFCFK1-15-0 |
| **Module Title** | Fundamentals of Data Science |
| **Module Tutors** | Saurav Gautam |
| **Year** | 2024-2025 |
| **Component/Element Number** | Portfolio |
| **Weighting** | 40% |

## Dates

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| --- | --- |
| **Date issued to students** | 31st March 2025 |
| **Submission Date** | 14th April 2025 |
| **Submission Place** | Backboard |
| **Submission Time** | 23:59 |
| **Submission Notes** | Submit Gitlab URL |

**Task 1 *(30: basic requirements + 10: bonus points for creativity)***

**Objective:**  
Build a **Student Profile Management System** to handle student personal information, examination data, and extracurricular activities (ECA).

Your program must use four text files:

* **users.txt**: Stores registered users’ personal information, including their roles (admin/student).
* **grades.txt**: Contains marks for five subjects for students.
* **eca.txt**: Details of extracurricular activities for each student.
* **passwords.txt**: Stores usernames and their passwords (use simple storage for learning purposes)

**Basic Requirements:**

1. Implement a login system that validates usernames and passwords.
   * Display an error and re-prompt for incorrect credentials.
   * Differentiate between admin and student roles upon login.
2. **Admin Role**:
   * Add new users with unique IDs.
   * Update, modify, or delete student records (personal, grades, and ECA).
   * Generate useful insights from the data (e.g., average grades per subject, most active students in ECA).
3. **Student Role**:
   * Update their profile information.
   * View personal details, ECA participation, and exam grades.
4. Ensure the program demonstrates:
   * Object-Oriented Programming (OOP) concepts (classes, inheritance, etc.).
   * Functions for modular design.
   * File handling for reading/writing data.
   * Exception handling for error-prone sections.
5. Creativity is rewarded for features like:
   * Visualizing data (e.g., plotting grades).
   * Improved user interface or additional functionalities.

### Task 2 *(Optional Advanced Feature – 10 Bonus Points)*

**Implement a Performance Analytics Dashboard:**

For admin users, create an analytics module that provides:

* **Grade Trends**: Display trends for students’ grades using charts.
* **ECA Impact**: Correlate ECA involvement with academic performance.
* **Performance Alerts**: Identify students performing below a specific threshold and suggest interventions.

Use libraries such as **matplotlib** or **pandas** for data visualization and analysis.

**Submission Requirements:**

* Submit the source code.
* Include sample input/output to demonstrate the functionality.
* Submit a written report describing the project, relevant flowcharts, test output screen screenshots.
* Work contribution and reflection of each member.
* Presentation slides.