



**Bytewise Fellowship Program**

**DATA SCIENCE**  
**Project Report01**  
**BWT- Data Science (Group1)**

**Submitted to: Mahrukh Khan**  
**Submitted by: Usama Malik**



# Project Report

## Task: Mini Project: Student Performance Tracker

### Introduction

The Student Performance Tracker is a Python-based application designed to manage student records and track their grades. It allows users to add student details, record and update grades, and calculate basic statistical measures (mean, median, and mode) for student grades. This project utilizes concepts of object-oriented programming (OOP) such as classes, encapsulation, and basic statistical operations.

### Objectives

- **Manage Student Records:** Store and update student details.
- **Record Grades:** Add and manage grades for each student.
- **Calculate Statistics:** Compute mean, median, and mode for the grades.
- **User Interaction:** Provide a simple command-line interface (CLI) for users to interact with the application.

### Classes and Their Responsibilities

#### 1. Student Class

- **Attributes:** student\_id, name, age, grades.
- **Methods:**
  - `__init__`: Initializes a new student with ID, name, and age.
  - `add_grade`: Adds a grade to the student's record.
  - `__str__`: Provides a string representation of the student.

### Grade Class

- **Attributes:** grades (list to store grades).
- **Methods:**
  - `__init__`: Initializes the grade list.
  - `add_grade`: Adds a grade to the list.
  - `mean`: Calculates the average of the grades.
  - `median`: Finds the middle value of the sorted grades.
  - `mode`: Determines the most frequently occurring grade(s).
  - `__str__`: Provides a string representation of the grades.

### User Interface

The project uses a simple command-line interface to interact with the user. The interface allows the user to:

- Add new students.
- Record grades for students.
- Display student information.

- Calculate and display grade statistics.
- Exit the application.

## Summary

The Student Performance Tracker project demonstrates the use of Python classes, inheritance, and encapsulation to manage student records and perform basic statistical analysis on their grades. The simple command-line interface allows users to interact with the application easily. This project consolidates the fundamental concepts learned in Python and provides a practical application for tracking student performance.

