



Student Grade Calculator

Week 2 Project - Control Flow & Data Structures (Python)



Project Overview

The **Student Grade Calculator** is a Python console-based application designed to calculate student grades based on their academic performance. The project uses control flow statements, data structures, and functions to process marks, calculate averages, assign grades, and display class statistics.



Objectives

- Practice Python **control flow** (if-elif-else, loops)
 - Use **functions** for modular programming
 - Apply **lists and dictionaries** to store student data
 - Validate user input effectively
 - Generate meaningful academic reports
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Technologies Used

- **Python 3**
 - Standard Python libraries only
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Core Concepts Used

- Conditional statements
 - Loops (for, while)
 - Functions
 - Lists and dictionaries
 - Exception handling (try-except)
 - Formatted output
-



Function Descriptions



```
calculate_grade(average)
```

Purpose: Determines the grade and performance comment based on the student's average marks.

Grading Logic: | Average Marks | Grade | Remark | |-----|-----|-----| | ≥ 90 | A | Excellent | | ≥ 80 | B | Very Good | | ≥ 70 | C | Good | | ≥ 60 | D | Needs Improvement | | < 60 | F | Fail |



get_valid_number(prompt, min_val, max_val)

Purpose: Ensures that the user enters a valid numeric value within a given range (0–100).

Features: - Handles invalid input using exception handling - Prevents out-of-range marks



main()

Purpose: Controls the entire program flow.

Responsibilities: - Accepts number of students - Collects names and subject marks - Calculates averages and grades - Displays results summary - Shows class statistics



Data Structures Used

- **Lists:**

- student_names

- student_marks

- **Dictionary** (inside list):

```
{  
    'average': value,  
    'grade': value,  
    'comment': value  
}
```



Sample Program Output



Input

```
Enter number of students: 2
```

```
Student name: Rahul
```

```
Math: 85
```

Science: 90
English: 88

Student name: Priya
Math: 65
Science: 70
English: 68

⌚ Output

RESULTS SUMMARY

Name	Avg	Grade	Comment
Rahul	87.7	B	Very Good! You're doing well.
Priya	67.7	D	Needs Improvement. Please study more.

CLASS STATISTICS

Total Students: 2
Class Average: 77.7
Highest Average: 87.7 (Rahul)
Lowest Average: 67.7 (Priya)

🔗 Key Features

- ✓ Input validation for marks
- ✓ Automatic grade calculation
- ✓ Multiple student support
- ✓ Class performance analysis
- ✓ User-friendly output format

💡 Future Enhancements

- Add more subjects
- Save results to file (CSV / JSON)
- Menu-driven interface
- Graphical User Interface (GUI)

💰 Conclusion

The Student Grade Calculator is a simple yet effective Python project that demonstrates the use of control flow statements, functions, and data structures to solve a real-world academic problem. It is well-suited for beginners and academic submissions.



Project Repository Link

(Add GitHub HTTPS link here)