

Minor project

Project Option 2: student marks analyzer using python and NumPy

Problem Statement:

The goal of this project is to create a Python program that uses a NumPy array to store the marks of multiple students. In order to determine total marks, average marks, highest marks, and lowest marks, the program analyzes the marks. The program uses conditional statements to determine a grade based on the average marks. This project makes it easier to comprehend how NumPy and Python can be combined for basic data analysis.

✓ Logic Explanation

To perform array operations, NumPy must first be imported.

To assign grades based on average marks using if-elif-else conditions, a user-defined function called `assign_grade()` is created.

The user is prompted by the program to enter the number of students.

Each student's marks are recorded in a list using a for loop.

A NumPy array is created from the list.

Total marks, average marks, highest marks, and lowest marks are computed using NumPy functions.

Conditional statements are used to assign the grade.

Lastly, print statements are used to display all of the results.

```
import numpy as np

# Function to assign grade based on average marks
def assign_grade(average):
    if average > 85:
        return "A"
    elif average >= 70 and average <= 85:
        return "B"
    elif average >= 50 and average <= 69:
        return "C"
    else:
        return "Fail"

# Main Program
print("STUDENT MARKS ANALYZER")

number_of_students = int(input("Enter number of students: "))

marks_list = []

# Taking input using loop
for i in range(number_of_students):
    marks = int(input(f"Enter marks of student {i+1}: "))
    marks_list.append(marks)

# Convert list to NumPy array
marks_array = np.array(marks_list)

# Calculations using NumPy
total_marks = marks_array.sum()
average_marks = marks_array.mean()
highest_marks = marks_array.max()
lowest_marks = marks_array.min()

# Assign grade
for i in range(n):
    print("student", i+1, "marks:", arr[i], "grade:", assign_grade(arr[i]))

# Output
print("\nRESULT ANALYSIS")
print("Total Marks:", total marks)
```

```
print("Average Marks:", average_marks)
print("Highest Marks:", highest_marks)
print("Lowest Marks:", lowest_marks)
```

STUDENT MARKS ANALYZER

```
Enter number of students: 5
Enter marks of student 1: 89
Enter marks of student 2: 75
Enter marks of student 3: 43
Enter marks of student 4: 67
Enter marks of student 5: 98
student 1 marks: 92 grade: A
student 2 marks: 74 grade: B
student 3 marks: 39 grade: Fail
student 4 marks: 55 grade: C
student 5 marks: 67 grade: C
```

RESULT ANALYSIS

```
Total Marks: 372
Average Marks: 74.4
Highest Marks: 98
Lowest Marks: 43
```

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