Coursework-2: OOP in C++

TASK - 1

Submitted by

Name: Ajaj Ahmed

Student ID: 24000864

Cybersecurity and Digital Forensics

Kathmandu, Nepal

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Task 1: Basic student grading system prototype using classes and objects

Write a program that manages a simple student grade calculator with the following requirements. Create a `Student` class that has:

1. Student name (string)
2. Three subject marks (integers)
3. A basic member function to calculate average

The program should:

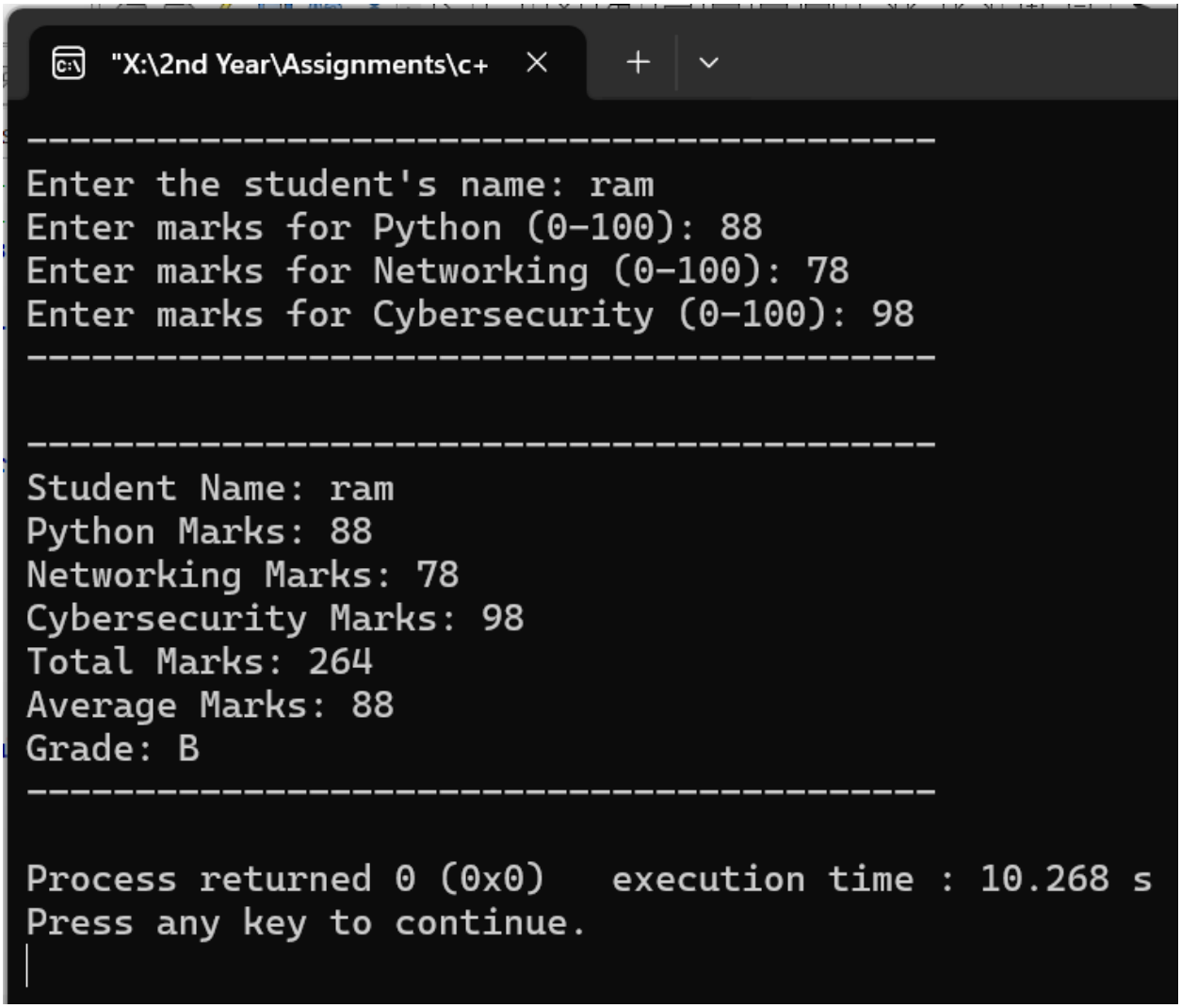
1. Accept student details (name and marks) from user input
2. Calculate and display:
    1. Total marks
    2. Average marks
    3. Grade (A for ≥90%, B for ≥80%, C for ≥70%, D for ≥60%, F for <60%)
3. Display a message if any mark is below 0 or above 100

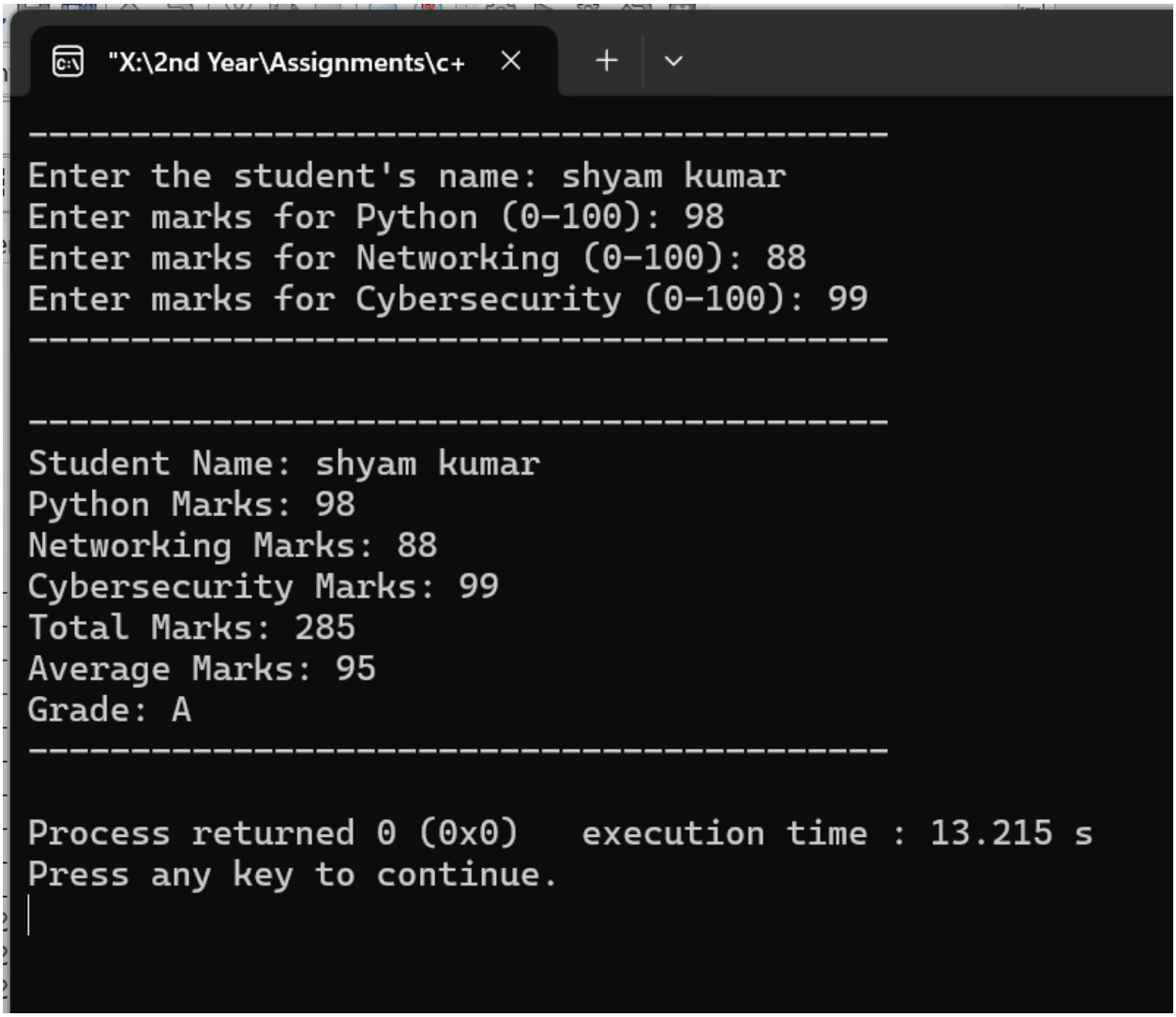
```
#include <iostream>
#include <string>
using namespace std;

class Student

{

private:

    string name;

    string subjects[3] = {"Python", "Networking", "Cybersecurity"};

    int marks[3];
```

```
public:

    void getDetails()

        {

            cout << "----------------------------------------" << endl;

            cout << "Enter the student's name: ";

        getline(cin, name);

        for (int i = 0; i < 3; i++)

            {

                cout << "Enter marks for " << subjects[i] << " (0-100): ";

                cin >> marks[i];

            while (marks[i] < 0 || marks[i] > 100)

                {

                    cout << "Invalid input! Marks must be between 0 and 100.
Please enter again: ";

                    cin >> marks[i];

                }
        }
        cout << "----------------------------------------" << endl;
    }

    int totalMarks()

    {

        int total = 0;

        for (int i = 0; i < 3; i++)

            {
```

```
            total += marks[i];

        }

    return total;
}


double averageMarks()

{

    return static_cast<double>(totalMarks()) / 3.0;
}

char calculateGrade()

{

    double avg = averageMarks();

    if (avg >= 90)
        return 'A';

    else if (avg >= 80)
        return 'B';

    else if (avg >= 70)
        return 'C';

    else if (avg >= 60)
        return 'D';

    else
        return 'F';
}


void displayDetails()

{

    cout << "\n----------------------------------------" << endl;

    cout << "Student Name: " << name << endl;
```

```
        for (int i = 0; i < 3; i++)
            {

                cout << subjects[i] << " Marks: " << marks[i] << endl;

            }

        cout << "Total Marks: " << totalMarks() << endl;

        cout << "Average Marks: " << averageMarks() << endl;

        cout << "Grade: " << calculateGrade() << endl;

        cout << "----------------------------------------" << endl;
    }
};

int main()

{
    Student s1;

    s1.getDetails();

    s1.displayDetails();

    return 0;
}
```


"X:\2nd Year\Assignments\c+
Enter the student's name: ram
Enter marks for Python (0-100): 88
Enter marks for Networking (0-100): 78
Enter marks for Cybersecurity (0-100): 98
Student Name: ram
Python Marks: 88
Networking Marks: 78
Cybersecurity Marks: 98
Total Marks: 264
Average Marks: 88
Grade: B
Process returned 0 (0x0) execution time : 10.268 s
Press any key to continue.


"X:\2nd Year\Assignments\c+

Enter the student's name: shyam kumar
Enter marks for Python (0-100): 98
Enter marks for Networking (0-100): 88
Enter marks for Cybersecurity (0-100): 99

Student Name: shyam kumar
Python Marks: 98
Networking Marks: 88
Cybersecurity Marks: 99
Total Marks: 285
Average Marks: 95
Grade: A

Process returned 0 (0x0) execution time : 13.215 s
Press any key to continue.