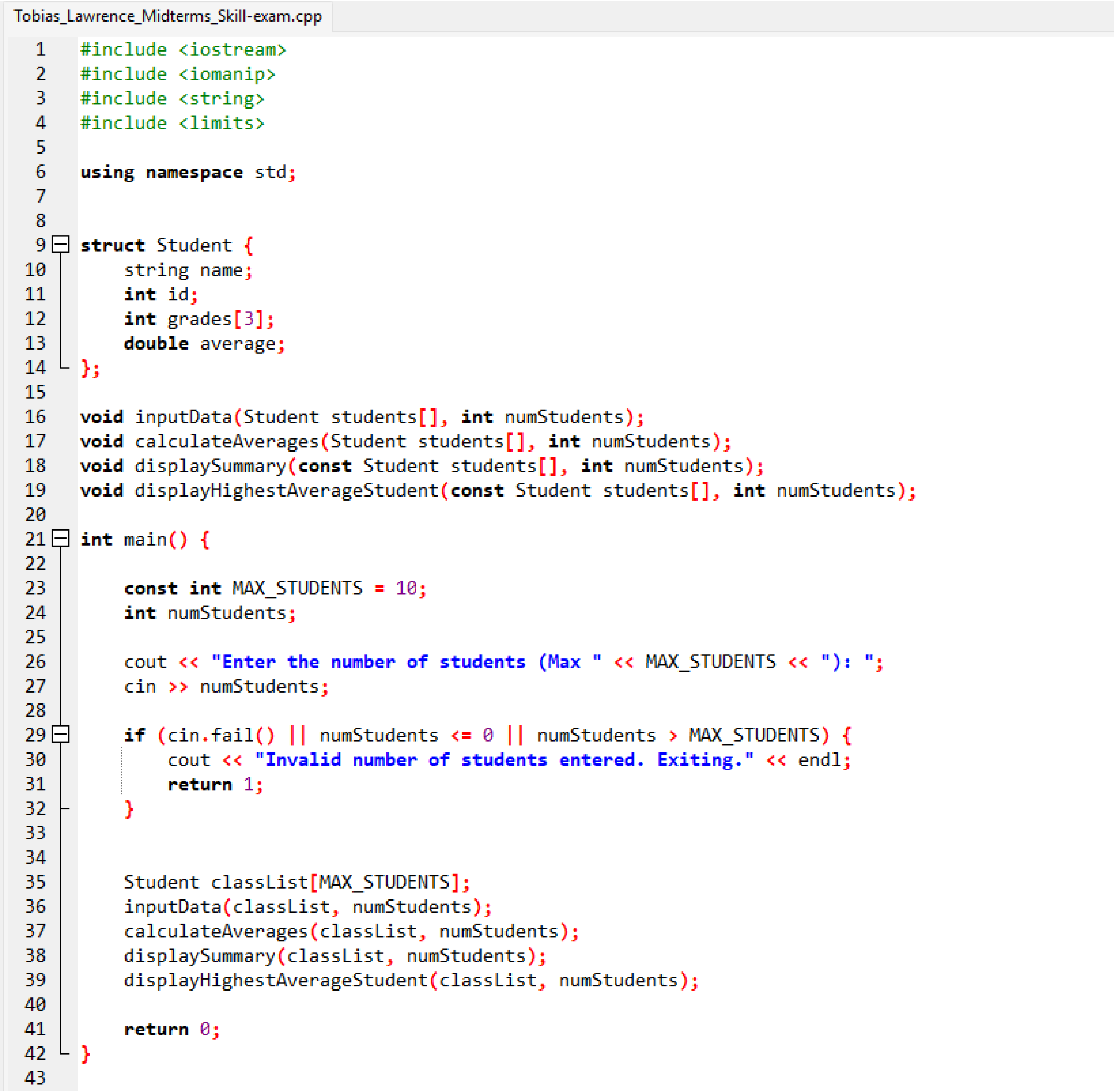
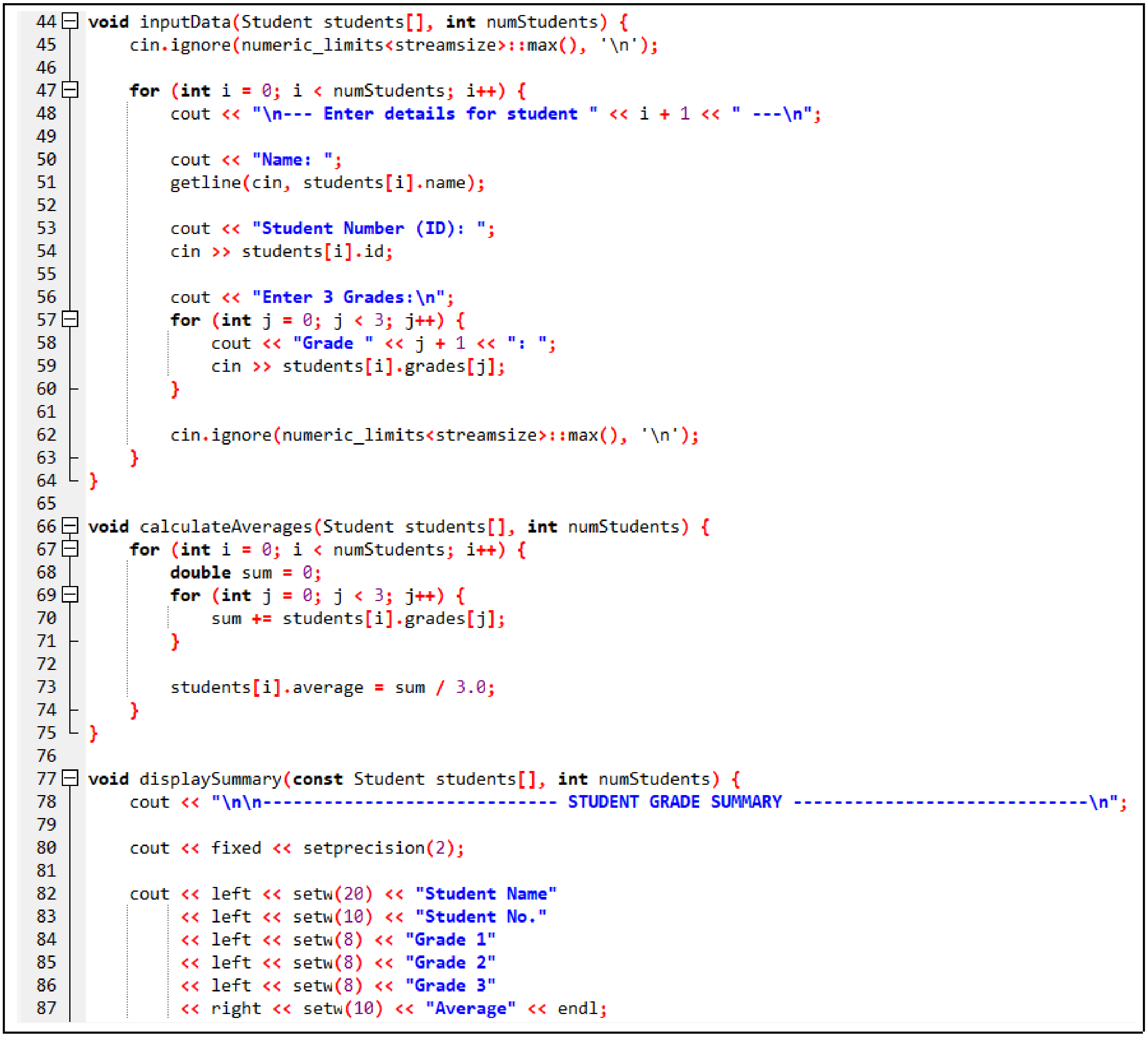
Midterms	
Skill exam	
Course Code: CPE007	**Program: Computer Engineering**
Course Title: Programming Logic and Design	**Date Performed: October 09, 2025**
Section: CPE11S1	**Date Submitted: October 09, 2025**
Name(s): Tobias, Lawrence C.	**Instructor: Engr. Jimlord M. Quejado**
6. Output	

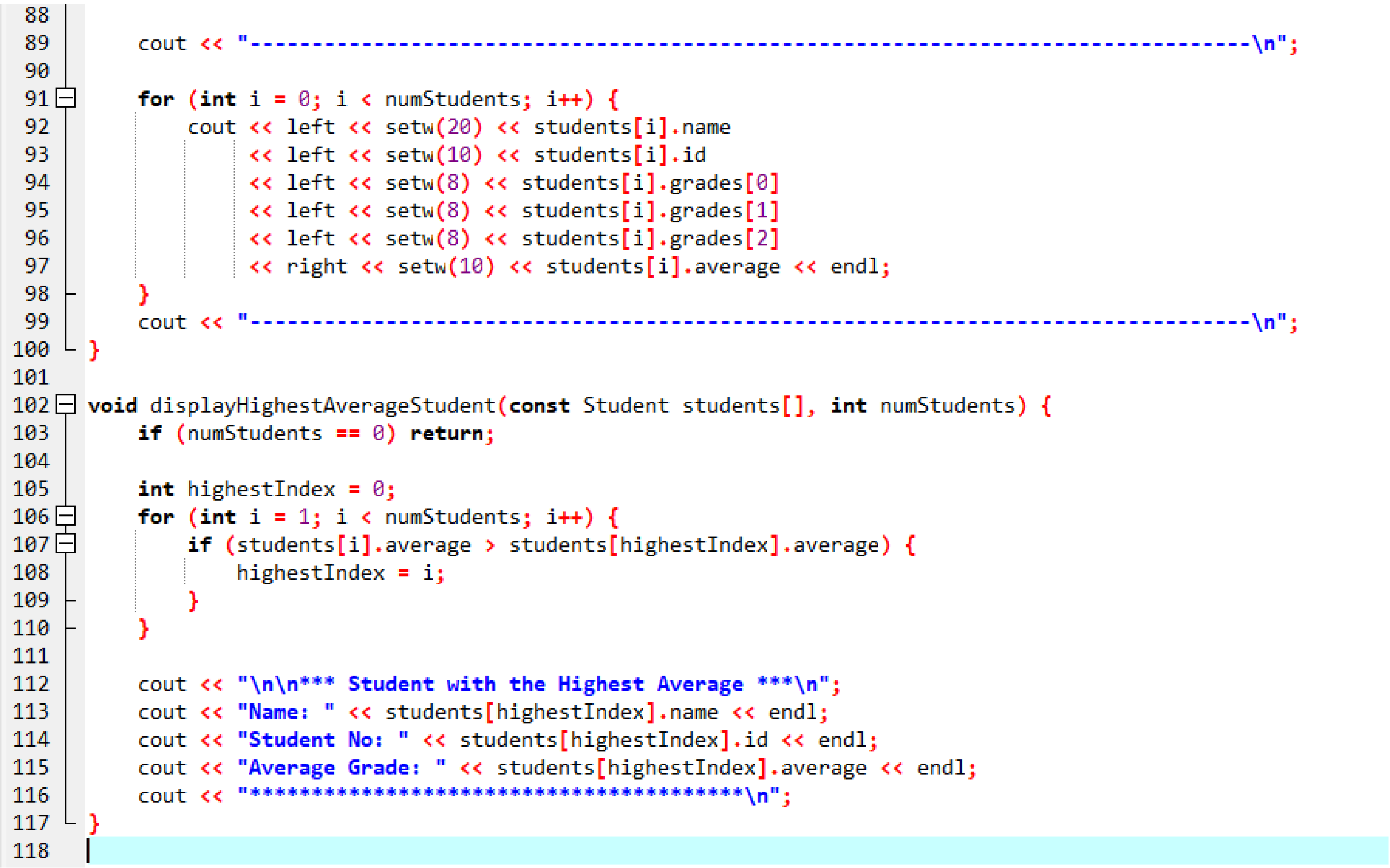
CODE:



```cpp
#include <iostream>
#include <iomanip>
#include <string>
#include <limits>

using namespace std;


struct Student {
    string name;
    int id;
    int grades[3];
    double average;
};

void inputData(Student students[], int numStudents);
void calculateAverages(Student students[], int numStudents);
void displaySummary(const Student students[], int numStudents);
void displayHighestAverageStudent(const Student students[], int numStudents);

int main() {

    const int MAX_STUDENTS = 10;
    int numStudents;

    cout << "Enter the number of students (Max " << MAX_STUDENTS << "): ";
    cin >> numStudents;

    if (cin.fail() || numStudents <= 0 || numStudents > MAX_STUDENTS) {
        cout << "Invalid number of students entered. Exiting." << endl;
        return 1;
    }


    Student classList[MAX_STUDENTS];
    inputData(classList, numStudents);
    calculateAverages(classList, numStudents);
    displaySummary(classList, numStudents);
    displayHighestAverageStudent(classList, numStudents);

    return 0;
}

```

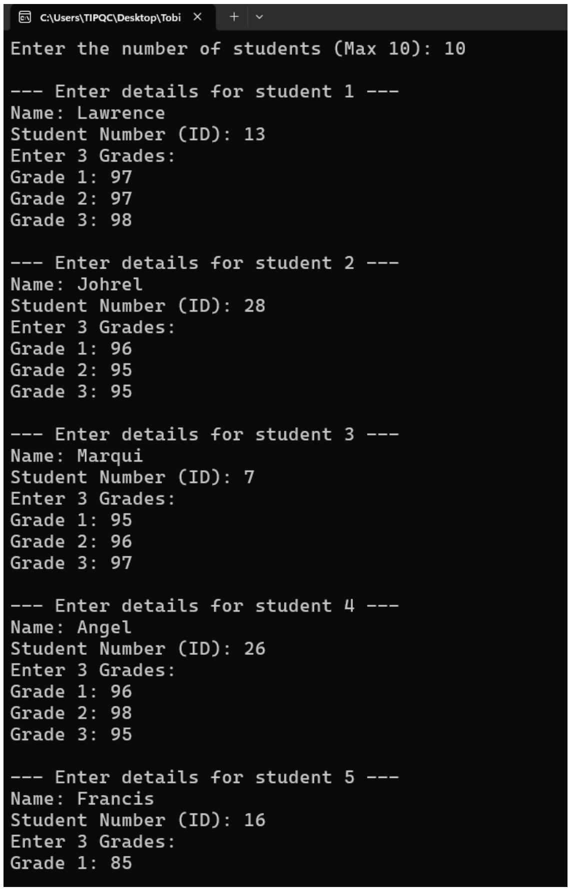


```cpp
void inputData(Student students[], int numStudents) {
    cin.ignore(numeric_limits<streamsize>::max(), '\n');

    for (int i = 0; i < numStudents; i++) {
        cout << "\n--- Enter details for student " << i + 1 << " ---\n";

        cout << "Name: ";
        getline(cin, students[i].name);

        cout << "Student Number (ID): ";
        cin >> students[i].id;

        cout << "Enter 3 Grades:\n";
        for (int j = 0; j < 3; j++) {
            cout << "Grade " << j + 1 << ": ";
            cin >> students[i].grades[j];
        }

        cin.ignore(numeric_limits<streamsize>::max(), '\n');
    }
}

void calculateAverages(Student students[], int numStudents) {
    for (int i = 0; i < numStudents; i++) {
        double sum = 0;
        for (int j = 0; j < 3; j++) {
            sum += students[i].grades[j];
        }

        students[i].average = sum / 3.0;
    }
}

void displaySummary(const Student students[], int numStudents) {
    cout << "\n\n----------------------------- STUDENT GRADE SUMMARY -----------------------------\n";

    cout << fixed << setprecision(2);

    cout << left << setw(20) << "Student Name"
         << left << setw(10) << "Student No."
         << left << setw(8) << "Grade 1"
         << left << setw(8) << "Grade 2"
         << left << setw(8) << "Grade 3"
         << right << setw(10) << "Average" << endl;
```

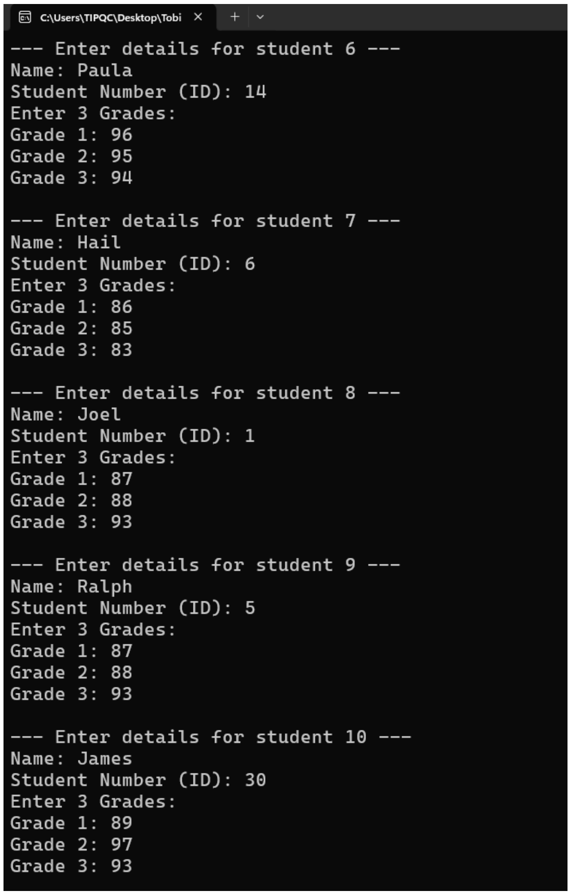


```

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

    for (int i = 0; i < numStudents; i++) {
        cout << left << setw(20) << students[i].name
             << left << setw(10) << students[i].id
             << left << setw(8) << students[i].grades[0]
             << left << setw(8) << students[i].grades[1]
             << left << setw(8) << students[i].grades[2]
             << right << setw(10) << students[i].average << endl;
    }
    cout << "--------------------------------------------------------------------------------\n";
}

void displayHighestAverageStudent(const Student students[], int numStudents) {
    if (numStudents == 0) return;

    int highestIndex = 0;
    for (int i = 1; i < numStudents; i++) {
        if (students[i].average > students[highestIndex].average) {
            highestIndex = i;
        }
    }

    cout << "\n\n*** Student with the Highest Average ***\n";
    cout << "Name: " << students[highestIndex].name << endl;
    cout << "Student No: " << students[highestIndex].id << endl;
    cout << "Average Grade: " << students[highestIndex].average << endl;
    cout << "****************************************\n";
}

```

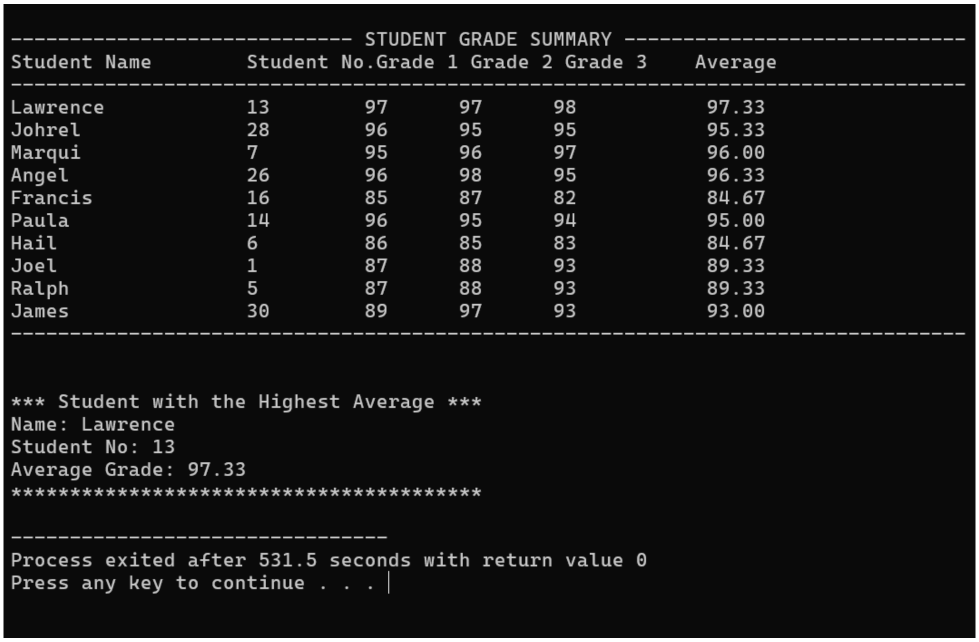
OUTPUT:



```
Enter the number of students (Max 10): 10

--- Enter details for student 1 ---
Name: Lawrence
Student Number (ID): 13
Enter 3 Grades:
Grade 1: 97
Grade 2: 97
Grade 3: 98

--- Enter details for student 2 ---
Name: Johrel
Student Number (ID): 28
Enter 3 Grades:
Grade 1: 96
Grade 2: 95
Grade 3: 95

--- Enter details for student 3 ---
Name: Marqui
Student Number (ID): 7
Enter 3 Grades:
Grade 1: 95
Grade 2: 96
Grade 3: 97

--- Enter details for student 4 ---
Name: Angel
Student Number (ID): 26
Enter 3 Grades:
Grade 1: 96
Grade 2: 98
Grade 3: 95

--- Enter details for student 5 ---
Name: Francis
Student Number (ID): 16
Enter 3 Grades:
Grade 1: 85
```



```
--- Enter details for student 6 ---
Name: Paula
Student Number (ID): 14
Enter 3 Grades:
Grade 1: 96
Grade 2: 95
Grade 3: 94

--- Enter details for student 7 ---
Name: Hail
Student Number (ID): 6
Enter 3 Grades:
Grade 1: 86
Grade 2: 85
Grade 3: 83

--- Enter details for student 8 ---
Name: Joel
Student Number (ID): 1
Enter 3 Grades:
Grade 1: 87
Grade 2: 88
Grade 3: 93

--- Enter details for student 9 ---
Name: Ralph
Student Number (ID): 5
Enter 3 Grades:
Grade 1: 87
Grade 2: 88
Grade 3: 93

--- Enter details for student 10 ---
Name: James
Student Number (ID): 30
Enter 3 Grades:
Grade 1: 89
Grade 2: 97
Grade 3: 93
```



```
----------------------------- STUDENT GRADE SUMMARY -----------------------------
Student Name        Student No.Grade 1 Grade 2 Grade 3    Average
---------------------------------------------------------------------------------
Lawrence            13        97      97      98           97.33
Johrel              28        96      95      95           95.33
Marqui              7         95      96      97           96.00
Angel               26        96      98      95           96.33
Francis             16        85      87      82           84.67
Paula               14        96      95      94           95.00
Hail                6         86      85      83           84.67
Joel                1         87      88      93           89.33
Ralph               5         87      88      93           89.33
James               30        89      97      93           93.00
---------------------------------------------------------------------------------


*** Student with the Highest Average ***
Name: Lawrence
Student No: 13
Average Grade: 97.33
****************************************

--------------------------------
Process exited after 531.5 seconds with return value 0
Press any key to continue . . .
```

7. Supplementary Activity

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8. Conclusion

- In this Midterm skill exam, I created a program that uses arrays, structures, and loops to calculate and display each student's average grade like what we were told to do in our set which is Set a. The program also identifies and shows the student with the highest average. I applied different C++ concepts such as input and output handling, loops for processing multiple students, and structures to group related data like names and grades. Honestly I struggled to do this because I kept getting errors along the way. Lucky for me that it worked. Overall, this activity helped me understand how arrays and structures work together to organize and compute data efficiently.