



Lab#13

Course Code:

BSE-1101

Course Title:

Programming Fundamentals

Submitted By:

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Section:

BSE - 1B

Registration Number:

2023 - BSE - 067

Submitted To:

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Code:

```
#include <iostream>
#include <string>

using namespace std;

struct Student {
    int studentID;
    string name;
    int age;
    int yob;
    float gpa;
};

void inputStudentData(Student& student) {
    cout << "Enter Student ID: ";
    cin >> student.studentID;
    cin.ignore();
    cout << "Enter Name: ";
    getline(cin, student.name);
    cout << "Enter Age: ";
    cin >> student.age;
    cout << "Enter Year of Birth: ";
    cin >> student.yob;
    cout << "Enter GPA: ";
    cin >> student.gpa;
}

void displayStudentData(const Student& student) {
    cout << "Student ID: " << student.studentID << "\nName: " << student.name <<
    "\nAge: " << student.age
    << "\nYear of Birth: " << student.yob << "\nGPA: " << student.gpa << endl;
}

void copyStudentData(Student& destination, const Student& source) {
    destination = source;
}

int main() {
    const int numStudents = 10;
    Student students[numStudents];

    float totalGPA = 0;
    float maxGPA = 0;
    float minGPA = numeric_limits<float>::max();
    int countGPA3Plus = 0;
    int countGPA2To3 = 0;
    int countGPAUnder2 = 0;

    for (int i = 0; i < numStudents; ++i) {
        cout << "\nEnter data for Student " << i + 1 << ":\n";
        inputStudentData(students[i]);

        totalGPA += students[i].gpa;
        if (students[i].gpa > maxGPA) {
            maxGPA = students[i].gpa;
        }
    }
}
```

```

        if (students[i].gpa < minGPA) {
            minGPA = students[i].gpa;
        }
        if (students[i].gpa >= 3) {
            countGPA3Plus++;
        }
        else if (students[i].gpa >= 2 && students[i].gpa < 3) {
            countGPA2To3++;
        }
        else {
            countGPAUnder2++;
        }
    }

    float averageGPA = totalGPA / numStudents;

    cout << "\nClass Statistics:\n";
    cout << "Average GPA: " << averageGPA << "\nMaximum GPA: " << maxGPA <<
"\nMinimum GPA: " << minGPA << endl;
    cout << "Students with GPA >= 3: " << countGPA3Plus << "\nStudents with GPA >= 2
AND < 3: " << countGPA2To3
        << "\nStudents with GPA < 2: " << countGPAUnder2 << endl;

    return 0;
}

```

Result:



Microsoft Visual Studio Debug Console



```
Enter data for Student 1:  
Enter Student ID: 067  
Enter Name: Uqba Gulzar  
Enter Age: 19  
Enter Year of Birth: 2004  
Enter GPA: 3.7
```

```
Enter data for Student 2:  
Enter Student ID: 4039  
Enter Name: Maryam Gul  
Enter Age: 24  
Enter Year of Birth: 1999  
Enter GPA: 3.5
```

```
Enter data for Student 3:  
Enter Student ID: 4040  
Enter Name: Rimsha Naheed  
Enter Age: 24  
Enter Year of Birth: 1999  
Enter GPA: 3.4
```

```
Enter data for Student 4:  
Enter Student ID: 987  
Enter Name: laiba  
Enter Age: 21  
Enter Year of Birth: 2002  
Enter GPA: 2.5
```

```
Enter data for Student 5:  
Enter Student ID: 786  
Enter Name: haya  
Enter Age: 22  
Enter Year of Birth: 2001  
Enter GPA: 3.00
```

```
Enter data for Student 6:  
Enter Student ID: 345  
Enter Name: meerab  
Enter Age: 23  
Enter Year of Birth: 2000
```

```
Microsoft Visual Studio Debug Console
Enter Age: 23
Enter Year of Birth: 2000
Enter GPA: 2.7

Enter data for Student 7:
Enter Student ID: 567
Enter Name: aira
Enter Age: 24
Enter Year of Birth: 1999
Enter GPA: 1.5

Enter data for Student 8:
Enter Student ID: 234
Enter Name: kashaf
Enter Age: 26
Enter Year of Birth: 1997
Enter GPA: 1.7

Enter data for Student 9:
Enter Student ID: 098
Enter Name: arooj
Enter Age: 16
Enter Year of Birth: 2006
Enter GPA: 2.6

Enter data for Student 10:
Enter Student ID: 123
Enter Name: sundas
Enter Age: 19
Enter Year of Birth: 2004
Enter GPA: 3.2

Class Statistics:
Average GPA: 2.78
Maximum GPA: 3.7
Minimum GPA: 1.5
Students with GPA >= 3: 5
Students with GPA >= 2 AND < 3: 3
Students with GPA < 2: 2

C:\Users\rimsh\source\repos\uqba1\x64\Debug\uqba1.exe (process 24896) exited with code 0.
```