



BAHRIA UNIVERSITY (KARACHI CAMPUS)

Lab Exam 1- Spring Semester – 2025 Computer Programming Lab: CSL-113

Class: BS (IT) 1A

Morning

Lab Instructor: Muhammad Bilal

Time Allowed: 60 min

Date: 27-Mar-2025

Max Marks: 12

Student Name: _____

Enrolment # _____

Note:

Cell Phones and other electronic gadgets are not allowed.

In case of cheating Lab Exam will be marked zero.

Upload your Solution on LMS.

Question 1

[CLO2, PLO3, P3]

[6 Marks]

You are a software developer tasked with creating a GPA Calculator for a university's student portal. The university follows a grading system where each course is graded based on marks obtained (out of 100), and each grade corresponds to a specific grading point. Students enroll in multiple courses, and each course carries a specific number of credit hours.

Develop and **accomplish** a system that should allow the user to:

- Input the **course name**, **marks obtained** (out of 100), and **credit hours** for each course. [A semester has maximum of 5 courses]
- Convert the marks into a **grading point** based on the following scale:

Marks Range	Grading Point
85 - 100	4.0
80 - 84	3.7
75 - 79	3.3
70 - 74	3.0
65 - 69	2.7
60 - 64	2.3
55 - 59	2.0
50 - 54	1.7
<50	0.0

- Calculate the **GPA** using the formula:

$$\text{GPA} = \frac{\sum(\text{credit hours} \times \text{grading points})}{\sum \text{credit hours}}$$

- d. Display the **GPA** at the end.
- e. The program should **keep running** until the user selects the **Exit option** from the menu.
- f. The program should have data validation.

VIVA

[Marks: 6]

Code:

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

float gradePoint(float marks){
    float gp = 0.00;
    if(marks >= 85 && marks <= 100){
        gp = 4.00;
    }
    else if(marks >= 80 && marks <= 84){
        gp = 3.7;
    }
    else if(marks >= 75 && marks <= 79){
        gp = 3.3;
    }
    else if(marks >= 70 && marks <= 74){
        gp = 3.0;
    }
    else if(marks >= 65 && marks <= 69){
        gp = 2.7;
    }
    else if(marks >= 60 && marks <= 64){
        gp = 2.3;
    }
    else if(marks >= 55 && marks <= 59){
        gp = 2.0;
    }
    else if(marks >= 50 && marks <= 54){
        gp = 1.7;
    }
    else{
        gp = 0.00;
    }
    return gp;
}

int main(){
    string sub1, sub2, sub3, sub4, sub5;
    float mark1 = 0.00, mark2 = 0.00, mark3 = 0.00, mark4 = 0.00, mark5 = 0.00;
    float cr1 = 0.00, cr2 = 0.00, cr3 = 0.00, cr4 = 0.00, cr5 = 0.00, totalCr = 0.00;
    float gp1 = 0.00, gp2 = 0.00, gp3 = 0.00, gp4 = 0.00, gp5 = 0.00, gpa = 0.00;
    int choice = 0;
    cout << endl;
```

```

cout << "-----"<<endl;
cout << "***Welcome To GPA Calculator***"<< endl;
cout << "-----"<<endl;
cout << endl;
do{
    cout << "---MENU---"<<endl;
    cout << "To calculate GPA, Press 1."<<endl;
    cout << "To exit, press 2."<<endl;
    cout << "Enter choice: ";
    cin >> choice;
    cout << endl;
    if(choice == 1){
        cout << "Enter the name of your 1st course: ";
        cin.ignore();
        getline(cin, sub1);
        do{
            cout << "Enter your marks in '\"<<sub1<<\"': ";
            cin >> mark1;
            if(mark1 < 0 || mark1 > 100){
                cout << "Invalid marks!"<<endl;
            }
        }while(mark1 < 0 || mark1 > 100);
        cout << "Enter credit hours of '\"<<sub1<<\"': ";
        cin >> cr1;
        cout << endl;
        cout << "Enter the name of your 2nd course: ";
        cin.ignore();
        getline(cin, sub2);
        do{
            cout << "Enter your marks in '\"<<sub2<<\"': ";
            cin >> mark2;
            if(mark2 < 0 || mark2 > 100){
                cout << "Invalid marks!"<<endl;
            }
        }while(mark2 < 0 || mark2 > 100);
        cout << "Enter credit hours of '\"<<sub2<<\"': ";
        cin >> cr2;
        cout << endl;
        cout << "Enter the name of your 3rd course: ";
        cin.ignore();
        getline(cin, sub3);
        do{
            cout << "Enter your marks in '\"<<sub3<<\"': ";
            cin >> mark3;
            if(mark3 < 0 || mark3 > 100){
                cout << "Invalid marks!"<<endl;
            }
        }
    }
}

```

```

}while(mark3 < 0 || mark3 > 100);
cout << "Enter credit hours of \' "<<sub3<<\' ": ";
cin >> cr3;
cout << endl;
cout << "Enter the name of your 4th course: ";
cin.ignore();
getline(cin, sub4);
do{
    cout << "Enter your marks in \' "<<sub4<<\' ": ";
    cin >> mark4;
    if(mark4 < 0 || mark4 > 100){
        cout << "Invalid marks!"<<endl;
    }
}while(mark4 < 0 || mark4 > 100);
cout << "Enter credit hours of \' "<<sub4<<\' ": ";
cin >> cr4;
cout << endl;
cout << "Enter the name of your 5th course: ";
cin.ignore();
getline(cin, sub5);
do{
    cout << "Enter your marks in \' "<<sub5<<\' ": ";
    cin >> mark5;
    if(mark5 < 0 || mark5 > 100){
        cout << "Invalid marks!"<<endl;
    }
}while(mark5 < 0 || mark5 > 100);
cout << "Enter credit hours of \' "<<sub5<<\' ": ";
cin >> cr5;
cout << endl;

//calculating grade pooint in each course
gp1 = gradePoint(mark1);
gp2 = gradePoint(mark2);
gp3 = gradePoint(mark3);
gp4 = gradePoint(mark4);
gp5 = gradePoint(mark5);

//displaying them
cout << "-----"<<endl;
cout << "Your grade point in \' "<<sub1<<\' is: "<<gp1<<endl;
cout << "Your grade point in \' "<<sub2<<\' is: "<<gp2<<endl;
cout << "Your grade point in \' "<<sub3<<\' is: "<<gp3<<endl;
cout << "Your grade point in \' "<<sub4<<\' is: "<<gp4<<endl;
cout << "Your grade point in \' "<<sub5<<\' is: "<<gp5<<endl;
cout << endl;

```

```

        //calculation for final gpa
        totalCr = cr1 + cr2 + cr3 + cr4 + cr5;
        gpa = ((gp1*cr1) + (gp2*cr2) + (gp3*cr3) + (gp4*cr4) +
(gp5*cr5))/totalCr;

        cout << "-----"<<endl;
        cout << "Your GPA is: "<<gpa<<endl;
        cout << "-----"<<endl;
        cout << endl;
    }
    else if(choice == 2){
        cout << "Ending program..."<<endl;
    }
    else{
        cout << "Invalid choice!"<<endl;
    }
}while(choice != 2);
}

```

Output:

```
PROBLEMS OUTPUT TERMINAL ... powershell + v [icon] [icon] ... < X
PS D:\Hasan\cpp\university\cplMid> ./a.exe

-----
***Welcome To GPA Calculator***
-----

---MENU---
To calculate GPA, Press 1.
To exit, press 2.
Enter choice: 1

Enter the name of your 1st course: Programming Fundamentals
Enter your marks in 'Programming Fundamentals': 88
Enter credit hours of 'Programming Fundamentals': 3

Enter the name of your 2nd course: ICT
Enter your marks in 'ICT': -10
Invalid marks!
Enter your marks in 'ICT': 74
Enter credit hours of 'ICT': 2

Enter the name of your 3rd course: Applied Physics
Enter your marks in 'Applied Physics': 59
Enter credit hours of 'Applied Physics': 3

Enter the name of your 4th course: Calculus
Enter your marks in 'Calculus': 82
Enter credit hours of 'Calculus': 3

Enter the name of your 5th course: Communication Skills
Enter your marks in 'Communication Skills': 64
Enter credit hours of 'Communication Skills': 2

-----
Your grade point in 'Programming Fundamentals' is: 4
Your grade point in 'ICT' is: 3
Your grade point in 'Applied Physics' is: 2

Ln 156, Col 2 Spaces: 4 UTF-8 CRLF {} C++ [icon] [icon] Go Live windows-gcc-x86 [icon]
```

```
-----  
Your grade point in 'Programming Fundamentals' is: 4  
Your grade point in 'ICT' is: 3  
Your grade point in 'Applied Physics' is: 2  
Your grade point in 'Calculus' is: 3.7  
Your grade point in 'Communication Skills' is: 2.3  
  
-----  
Your GPA is: 3.05385  
-----  
  
---MENU---  
To calculate GPA, Press 1.  
To exit, press 2.  
Enter choice: 2  
  
Ending program...  
PS D:\Hasan\cpp\university\cplMid> |
```

Ln 156, Col 2 Spaces: 4 UTF-8 CRLF {} C++ Go Live windows-gcc-x86

Output Validation (by ChatGPT):

✅ Inputs for 5 courses (with one invalid mark to test validation):

```
pgsql Copy Edit  
  
Enter the name of your 1st course: Programming Fundamentals  
Enter your marks in 'Programming Fundamentals': 88  
Enter credit hours of 'Programming Fundamentals': 3  
  
Enter the name of your 2nd course: ICT  
Enter your marks in 'ICT': -10   ← invalid input  
Enter your marks in 'ICT': 74  
Enter credit hours of 'ICT': 2  
  
Enter the name of your 3rd course: Applied Physics  
Enter your marks in 'Applied Physics': 59  
Enter credit hours of 'Applied Physics': 3
```



```
Enter credit hours of 'Applied Physics': 3

Enter the name of your 4th course: Communication Skills
Enter your marks in 'Communication Skills': 64
Enter credit hours of 'Communication Skills': 2

Enter the name of your 5th course: Calculus
Enter your marks in 'Calculus': 82
Enter credit hours of 'Calculus': 3
```

✓ Manual GPA Calculation (if you wanna check it):

markdown

Copy

Edit

```
GPA = ((4.00*3) + (3.00*2) + (2.00*3) + (2.30*2) + (3.70*3)) / (3+2+3+2+3)
      = (12 + 6 + 6 + 4.6 + 11.1) / 13
      = 39.7 / 13
      ≈ 3.0538
```

So your program should show something like:

csharp

Copy

Edit

```
Your GPA is: 3.05385
```