



LABORATORY 2

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Abstract

We learned to use if and else statements. We also implemented the bool and "and" statements.

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Ece 1310 C for Engineers

1. Write a C++ program that tells the user the grade earned in a class. The user will enter 3 exam scores ranging from 0 to 100. The program should calculate and display the average. Based on the average, determine and display the letter grade the student received in the class.

```
// ECE 1310-04
// Author: Jordan Xu
// Description: average of 3 exam scores and grade
// Date: 2/17/2021

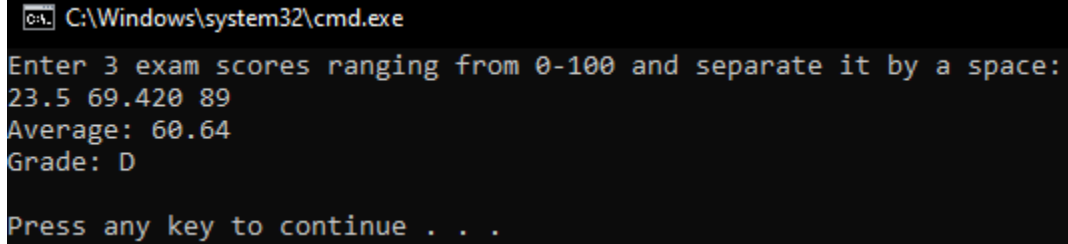
#include <iostream>
#include <cmath>
#include <iomanip>
using namespace std;
int main()
{
    double x, y, z, avg;
    bool x1, y1, z1; // true or false statement
    cout << fixed << showpoint << setprecision(2);
    cout << "Enter 3 exam scores ranging from 0-100 and separate it by a space: " << endl;
    cin >> x >> y >> z;
    x1 = (0 <= x && x <= 100) ? true : false;
    y1 = (0 <= y && y <= 100) ? true : false;
    z1 = (0 <= z && z <= 100) ? true : false;
    avg = (x + y + z) / 3;
    if (x1 && y1 && z1) // making sure scores are valid
    {
        if (avg >= 90.0)
        {
            cout << "Average: " << avg << endl;
            cout << "Grade: A" << endl;
        }
        else if (80.0 <= avg && avg < 90.0)
        {
            cout << "Average: " << avg << endl;
            cout << "Grade: B" << endl;
        }
        else if (70.0 <= avg && avg < 80.0)
        {
            cout << "Average: " << avg << endl;
            cout << "Grade: C" << endl;
        }
        else if (60.0 <= avg && avg < 70.0)
        {
            cout << "Average: " << avg << endl;

```

```
        cout << "Grade: D" << endl;
    }
    else
    {
        cout << "Average: " << avg << endl;
        cout << "Grade: F" << endl;
    }

    cout << endl;

}
else
    cout << "Invalid Scores" << endl;
    return 0;
}
```



C:\Windows\system32\cmd.exe

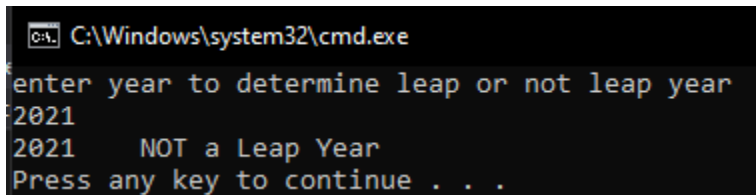
Enter 3 exam scores ranging from 0-100 and separate it by a space:
23.5 69.420 89
Average: 60.64
Grade: D

Press any key to continue . . .

2. Write a C++ program where the user will enter a year and your program should determine and display it is a leap year.

```
// ECE 1310-04
// Author: Jordan Xu
// Description: display number of Fahrenheit to Celsius and vise versa
// Date: 2/17/2021

#include <iostream>
#include <cmath>
#include <iomanip>
using namespace std;
int main()
{
    int year;
    bool isLeap;
    cout << "enter year to determine leap or not leap year" << endl;
    cin >> year;
    //shortest code
    // isLeap = !(year % 4 ? !(year % 100) ? !(year % 400) ? true : false ) : true ) : false;
    if (!(year % 4)) //!0 means true
        if (!(year % 100))
            if (!(year % 400))
                isLeap = true;
            else
                isLeap = false;
        else
            isLeap = true;
    else
        isLeap = false;
    if (isLeap)
        cout << year << "\t" << "Leap Year" << endl;
    else
        cout << year << "\t" << "NOT a Leap Year" << endl;
    return 0;
}
```



```
C:\Windows\system32\cmd.exe
enter year to determine leap or not leap year
2021
2021 NOT a Leap Year
Press any key to continue . . .
```