School Of Mechanical & Manufacturing Engineering, NUST

Department of Mechanical Engineering

CS-114 - Fundamental of Programing

Assignment # 02

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1. Create a program that takes a student's score as input and assigns a grade based on predefined criteria using logical operators (e.g., A, B, C, D, F). A-Grade: 90-100 Marks B-Grade: 75-90 Marks C-Grade: 60-75 Marks D-Grade: 45-60 Marks F-Grade: 0-45 Marks

Code

```
#include <iostream>
using namespace std;
int main ()
{
    float s;
    //variable to store float value
    cout<<"input student score "<<cin<<endl;
    cin>>s;
    //input a number from user

        if  (s>=90&&s<=100) {
        cout<< "the grade of student is A"<<endl;
    }

        else if (s>=75&&s<90) {
        cout<< "the grade of student is B"<<endl;
    }

        else if (s>=60&&s<75){
            cout<< "the grade of student is C"<<endl;
        }
        else if  (s>=45&&s<60){
        cout<< "the grade of student is D"<<endl;
        }
        else if (s>=0&&s<45){
        cout<< "the grade of student is F"<<endl;
    }
        else if (s>100||s<0) {
        cout<<"this score is invalid please try again"<<endl;
        }
        //check the ranges of numbers and assign grade
        return 0;


}
```

Output

```
D:\c++\grade.exe
input student score 0x486650
67
the grade of student is C

--------------------------------
Process exited after 4.662 seconds with return value 0
Press any key to continue . . .
```

Learning outcomes

- Using && operation and rational operators

2. Write a program that takes an integer as input and determines if it is both even and divisible by 5

Code

```
#include <iostream>
using namespace std;
int main ()
{
    int x;
    // variable to store integer value
    cout<<"enter a number"<<cin<<endl;
    cin>>x;
    //input a number from user
    if (x%2==0&&x%5==0) {
        cout<<"number is even and divisible by 5"<<endl;
    }
    else if (x%2==0&&!x%5==0) {
        cout<<"number is even and but not divisible by 5"<<endl;

    }
    else if (!x%2==0&&x%5==0) {
        cout<<"number is not even but divisible by 5"<<endl;

    }
    else if (!x%2==0&&!x%5==0) {
        cout<<"number is neither even nor divisible by 5"<<endl;

    }
    //check divisibility of number by 2 and 5
    return 0;

}
```

Output

```
enter a number0x486650
40
number is even and divisible by 5

--------------------------------
Process exited after 2.426 seconds with return value 0
Press any key to continue . . .
```

Learning outcomes

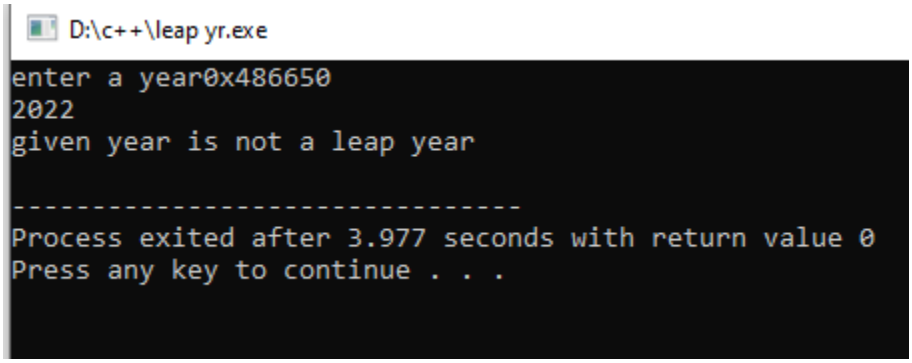
- Writing codes regarding multiples of a number.

3. Create a C++ program that checks if a user-provided year is a leap year.

Code

```
#include <iostream>
using namespace std;
int main ()
{
   int y;
   //variable to store integer value
   cout<<"enter a year"<<cin<<endl;
   cin>>y;
   if (y%4==0) {
    cout<<"given year is a leap year"<<endl;
   }
   //check if number is divisible by 4
   else {
    cout<<"given year is not a leap year"<<endl;
   }
   return 0;
}
```

Output



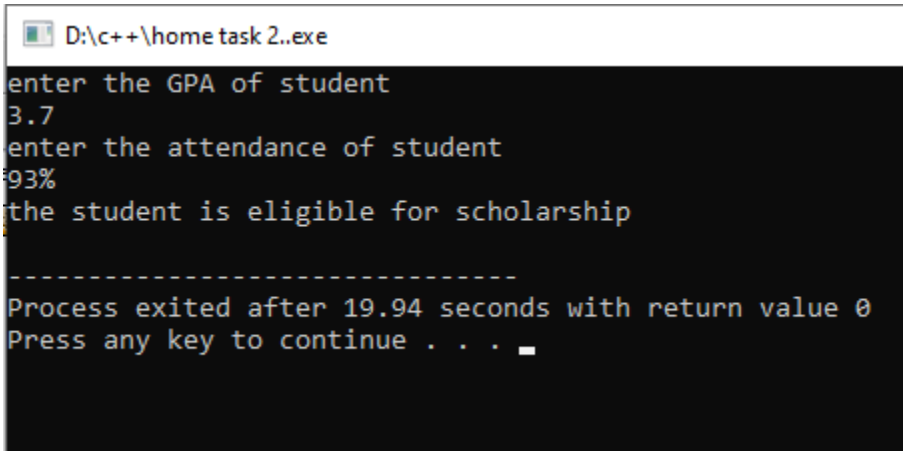
4. Create a C++ program that determines if a student is eligible for a scholarship based on their GPA (must have GPA >= 3.5) and attendance (must have attended at least 80% of classes)

Code

```
#include <iostream>
using namespace std;
int main()
{
    float g , a;
    //variables to store float values
    cout<<"enter the GPA of student "<<endl;
    cin>>g;
    //user to enter value
    cout<<"enter the attendance of student   " <<endl;
    cin>>a;
    //user to enter value
    if (g>=3.5&&a>=80) {
        cout<<"the student is eligible for scholarship"<<endl;
    }
    else {
        cout<<"student is not eligible for scholarship"<<endl;
    }
    //check if both values fall under given range

    return 0;
}
```

Output



5. Write a program that checks if a given character is a vowel (a, e, i, o, u) or a consonant using logical operators.

Code

```
#include <iostream>
using namespace std;
int main()
{
    char ch;
    cout<<"enter a character"<<endl;
    cin>>ch;
    // Input character from user
   // Condition for vowel
    if(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u' ||
       ch=='A' || ch=='E' || ch=='I' || ch=='O' || ch=='U' )
    {
       cout<<"given character is a vowel"<<endl;
    }
    else if((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z'))
    {
        // Condition for consonant
        cout<<"given character is a consonant"<<endl;
    }
    else
    {

        //If it is neither vowel nor consonant ie not an alphabet
         cout<<"given character is not an alphabet"<<endl;
    }

    return 0;
}
```

Output

```
enter a character
f
given character is a consonant

--------------------------------
Process exited after 1.916 seconds with return value 0
Press any key to continue . . .
```

Learning outcomes

- Using char variables
- Using of ‘’ marks