School of Mechanical and Manufacturing Engineering, NUST

Department Of Mechanical Engineering

CS-114 - Fundamental of Programing

Assignment # 02

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Section: ME-15B

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Home Task 1:

Create a program that takes a student's score as input and assigns a grade based on predefined criteria using logical operators.

Solution:

```cpp
//Home Task

#include <iostream>
using namespace std;
//Task 1
int main(){
     double Marks;      //We Use "Double" Here So That We Can Also Input Marks in Decimal
     cout<<"Enter your Marks: ";
     cin>>Marks;                //This Command Will Take Input from the user
     if (Marks>=90&&Marks<=100){         //Using If Statement So That If input is in certain range it displays the respective Output
        cout<<"You have acquired A Grade";
     }
     if (Marks>=75&&Marks<90){         //Using AND Operator So That It Follows Both Conditions
        cout<<"You have acquired B Grade";
     }
     if (Marks>=60&&Marks<75){
        cout<<"You have acquired C Grade";
     }
     if (Marks>=45&&Marks<60){
        cout<<"You have acquired D Grade";
    }
    if (Marks>=0&&Marks<45){
        cout<<"You have acquired F Grade";
    }
    return 0;
}
```

Result:

```
C:\Users\hp\Documents\Programming\Assignment\Untitled2.exe
Enter your Marks: 95
You have acquired A Grade
--------------------------------
Process exited after 11.83 seconds with return value 0
Press any key to continue . . .
```

```
C:\Users\hp\Documents\Programming\Assignment\Untitled2.exe
Enter your Marks: 46
You have acquired D Grade
--------------------------------
Process exited after 12.41 seconds with return value 0
Press any key to continue . . .
```

```
C:\Users\hp\Documents\Programming\Assignment\Untitled2.exe
Enter your Marks: 32
You have acquired F Grade
--------------------------------
Process exited after 3.894 seconds with return value 0
Press any key to continue . . .
```

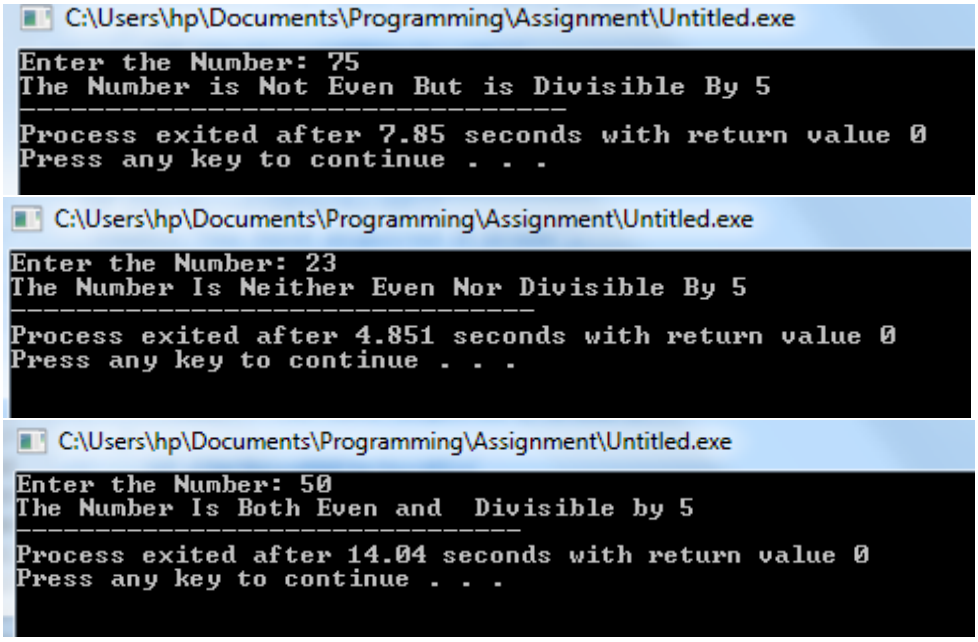
Home Task 2:

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

Solution:

```cpp
//Home Task

#include <iostream>
using namespace std;

//Task 2
int main(){
    int number;
    cout<<"Enter the Number: ";
    cin>>number;

    if ((number%2)==0&&(number%5)==0){           //Using If Statement So That If input fulfills the condition it displays the respective Output
        cout<<"The Number Is Both Even and  Divisible by 5 ";
}
    if ((number%2)==0&&(number%5)!=0){                //Using AND Operator So That It Follows Both Conditions Before Displaying the respective Output
        cout<<"The Number is Even But Is Not Divisible By 5";
    }
    if ((number%2)!=0&&(number%5)==0){
        cout<<"The Number is Not Even But is Divisible By 5";
    }
    if((number%2)!=0&&(number%5)!=0) {
        cout<<"The Number Is Neither Even Nor Divisible By 5";
    }
return 0;
}
```

Result:



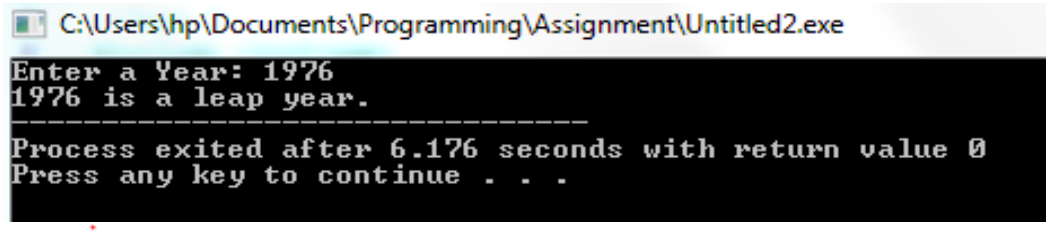
Home Task 3:

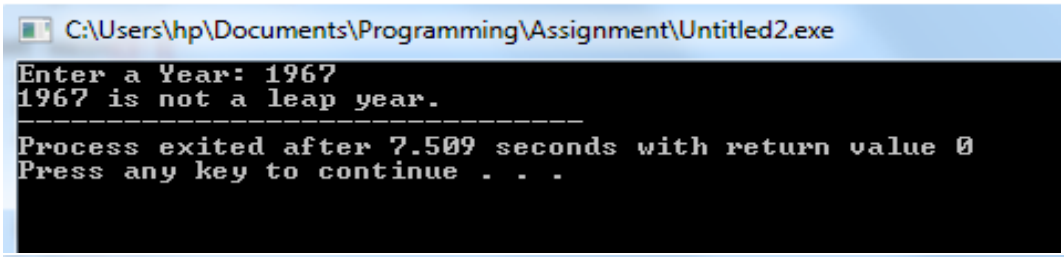
Create a C++ program that checks if a user-provided year is a leap year.

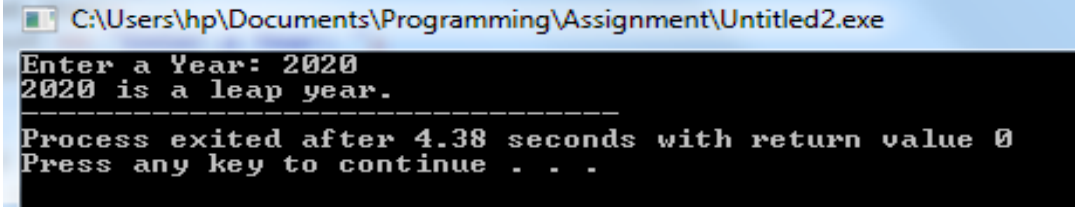
Solution:

```cpp
//Home Task

//Task 3
#include <iostream>
using namespace std;

int main() {
  int Year;
  cout << "Enter a Year: ";
  cin >> Year;            // If Year is Divisible by 4 AND not Divisible by 100.
   // OR If Year is Divisible by 400.
  // Then It is a leap year.
  if ((Year%4==0&&Year%100!=0)||Year%400==0){
    cout <<Year<< " is a leap year.";
  }
  else {
    cout <<Year<< " is not a leap year.";   //Otherwise It is Not A Leap Year
  }

  return 0;
}
```

Result:







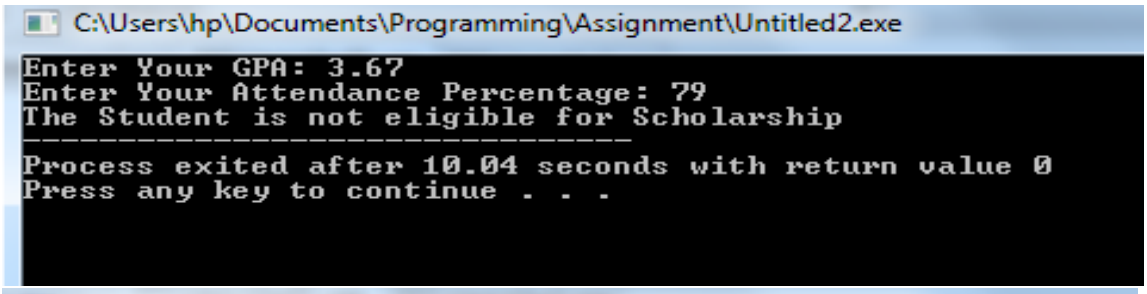
Home Task 4:

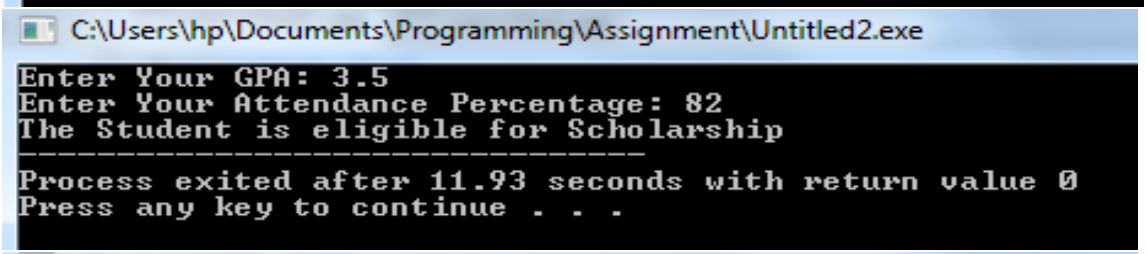
Create a C++ program that determines if a student is eligible for a scholarship based on their GPA and attendance.

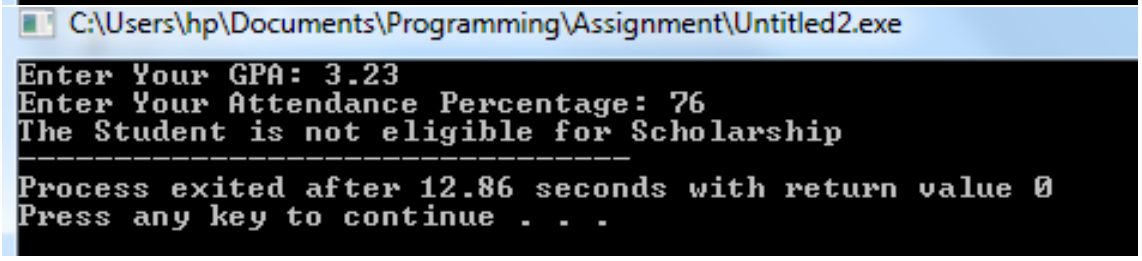
Solution:

```cpp
//Home Task

#include <iostream>
using namespace std;
//Task 4
int main(){
    double GPA,Attendance;          //Using Double So That the GPA in Decimals Can be Stored.
    cout<<"Enter Your GPA: ";
    cin>>GPA;
    cout<<"Enter Your Attendance Percentage: ";
    cin>>Attendance;
    if (GPA>=3.5&&Attendance>=80){                          //If Student Has Both GPA>3.5 and Attendance Above 80%
        cout<<"The Student is eligible for Scholarship.";       //Then The Student Is Eligible For Scholarship
    }
else {
    cout<<"The Student is not eligible for Scholarship.";      //Otherwise He Is Not Eligible for Scholarship
}
return 0;
}
```

Result:







Home Task 5:

Write a program that checks if a given character is a vowel or a consonant using logical operators.

Solution:

```
1   //Home Task
2
3   #include <iostream>
4   using namespace std;
5
6   //Task 5
7   int main(){
8       char Alphabet; //Using Char Because It can Store A Character(Alphabet)
9       cout<<"Enter the Alphabet: ";
10      cin>>Alphabet;                          //If The Given Character Is From The Below List
11      if(Alphabet=='A'||Alphabet=='I'||Alphabet=='O'||Alphabet=='E'||Alphabet=='U'     //Then It is A Vowel Otherwise It is A Consonant
12      ||Alphabet=='a'||Alphabet=='e'||Alphabet=='i'||Alphabet=='o'||Alphabet=='u'){
13          cout<<"The Given Alphabet is a Vowel";
14
15      }
16     else {
17      cout<<"The Given Alphabet is a consonant";
18     }
19  return 0;
20  }
```

Result: