

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

Date: 12-10-2023

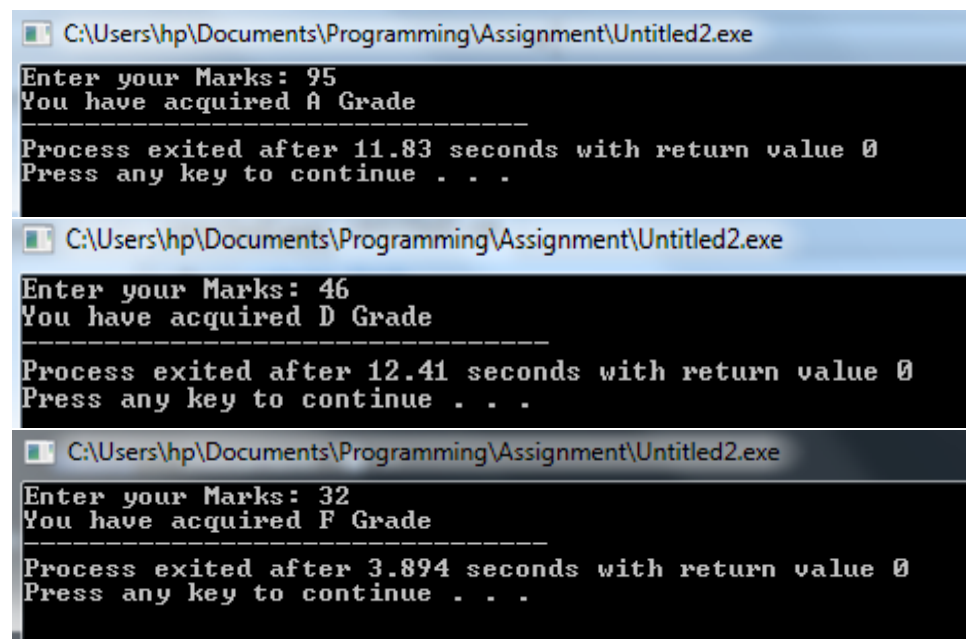
Home Task 1:

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

Solution:

```
1 //Home Task
2
3 #include <iostream>
4 using namespace std;
5 //Task 1
6 int main(){
7     double Marks; //We Use "Double" Here So That We Can Also Input Marks in Decimal
8     cout<<"Enter your Marks: ";
9     cin>>Marks; //This Command Will Take Input from the user
10    if (Marks>=90&&Marks<=100){ //Using If Statement So That If input is in certain range it displays the respective Output
11        cout<<"You have acquired A Grade";
12    }
13    if (Marks>=75&&Marks<90){ //Using AND Operator So That It Follows Both Conditions
14        cout<<"You have acquired B Grade";
15    }
16    if (Marks>=60&&Marks<75){
17        cout<<"You have acquired C Grade";
18    }
19    if (Marks>=45&&Marks<60){
20        cout<<"You have acquired D Grade";
21    }
22    if (Marks>=0&&Marks<45){
23        cout<<"You have acquired F Grade";
24    }
25    return 0;
26 }
```

Result:



The image shows three sequential screenshots of a Windows command prompt window running a C++ program. Each screenshot displays the program's output for a specific input mark.

Screenshot 1: The title bar shows the file path `C:\Users\hp\Documents\Programming\Assignment\Untitled2.exe`. The prompt displays "Enter your Marks: 95" and "You have acquired A Grade". Below this, it shows "Process exited after 11.83 seconds with return value 0" and "Press any key to continue . . .".

Screenshot 2: The title bar shows the same file path. The prompt displays "Enter your Marks: 46" and "You have acquired D Grade". Below this, it shows "Process exited after 12.41 seconds with return value 0" and "Press any key to continue . . .".

Screenshot 3: The title bar shows the same file path. The prompt displays "Enter your Marks: 32" and "You have acquired F Grade". Below this, it shows "Process exited after 3.894 seconds with return value 0" and "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:

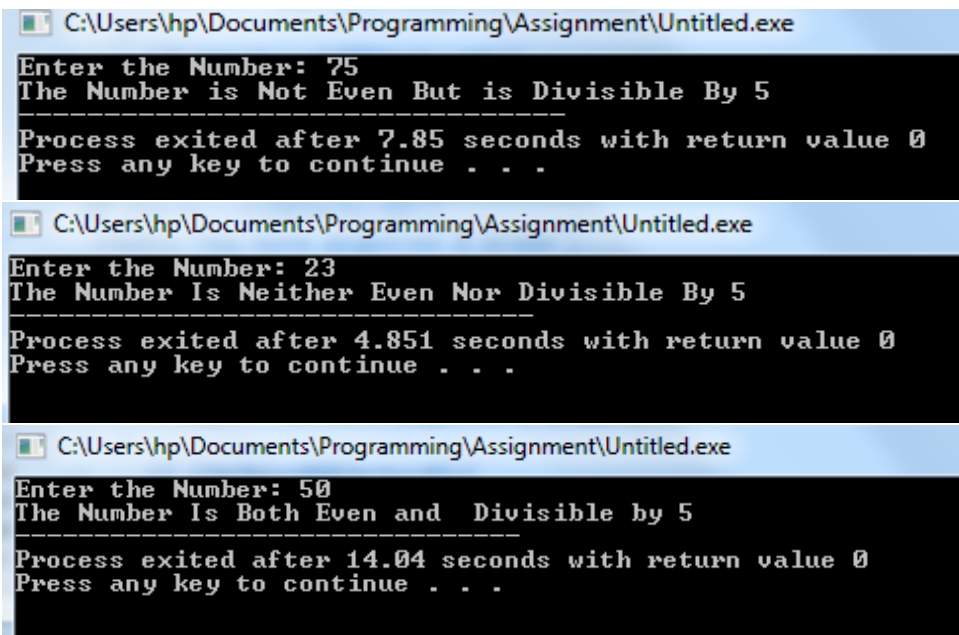
```
//Home Task

#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:



The image shows three separate screenshots of a Windows command prompt window running a C++ program. Each screenshot has a title bar that reads "C:\Users\hp\Documents\Programming\Assignment\Untitled.exe".

The first screenshot shows the input "75". The output is "The Number is Not Even But is Divisible By 5". Below the output, it says "Process exited after 7.85 seconds with return value 0" and "Press any key to continue . . .".

The second screenshot shows the input "23". The output is "The Number Is Neither Even Nor Divisible By 5". Below the output, it says "Process exited after 4.851 seconds with return value 0" and "Press any key to continue . . .".

The third screenshot shows the input "50". The output is "The Number Is Both Even and Divisible by 5". Below the output, it says "Process exited after 14.04 seconds with return value 0" and "Press any key to continue . . .".

Home Task 3:

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

Solution:

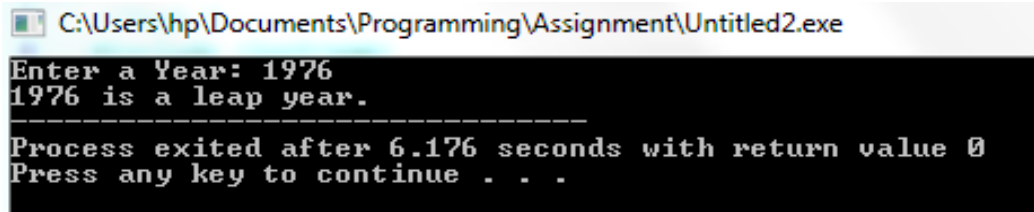
```
//Home Task

//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
    }

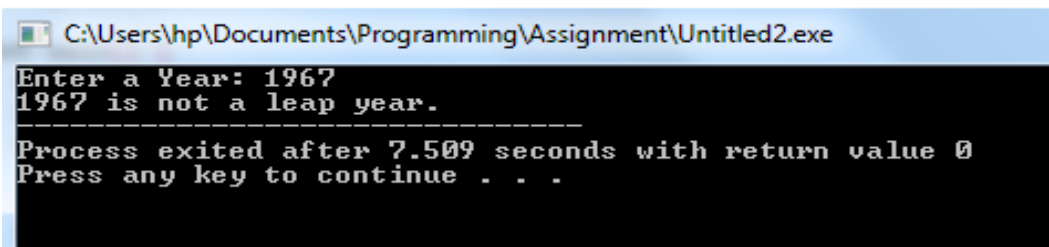
    return 0;
}
```

Result:



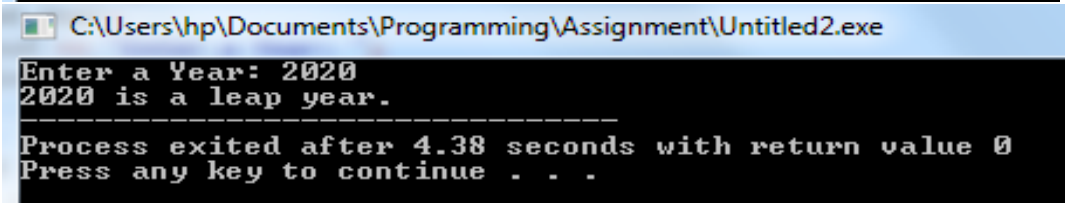
C:\Users\hp\Documents\Programming\Assignment\Untitled2.exe

```
Enter a Year: 1976
1976 is a leap year.
-----
Process exited after 6.176 seconds with return value 0
Press any key to continue . . .
```



C:\Users\hp\Documents\Programming\Assignment\Untitled2.exe

```
Enter a Year: 1967
1967 is not a leap year.
-----
Process exited after 7.509 seconds with return value 0
Press any key to continue . . .
```



C:\Users\hp\Documents\Programming\Assignment\Untitled2.exe

```
Enter a Year: 2020
2020 is a leap year.
-----
Process exited after 4.38 seconds with return value 0
Press any key to continue . . .
```

Home Task 4:

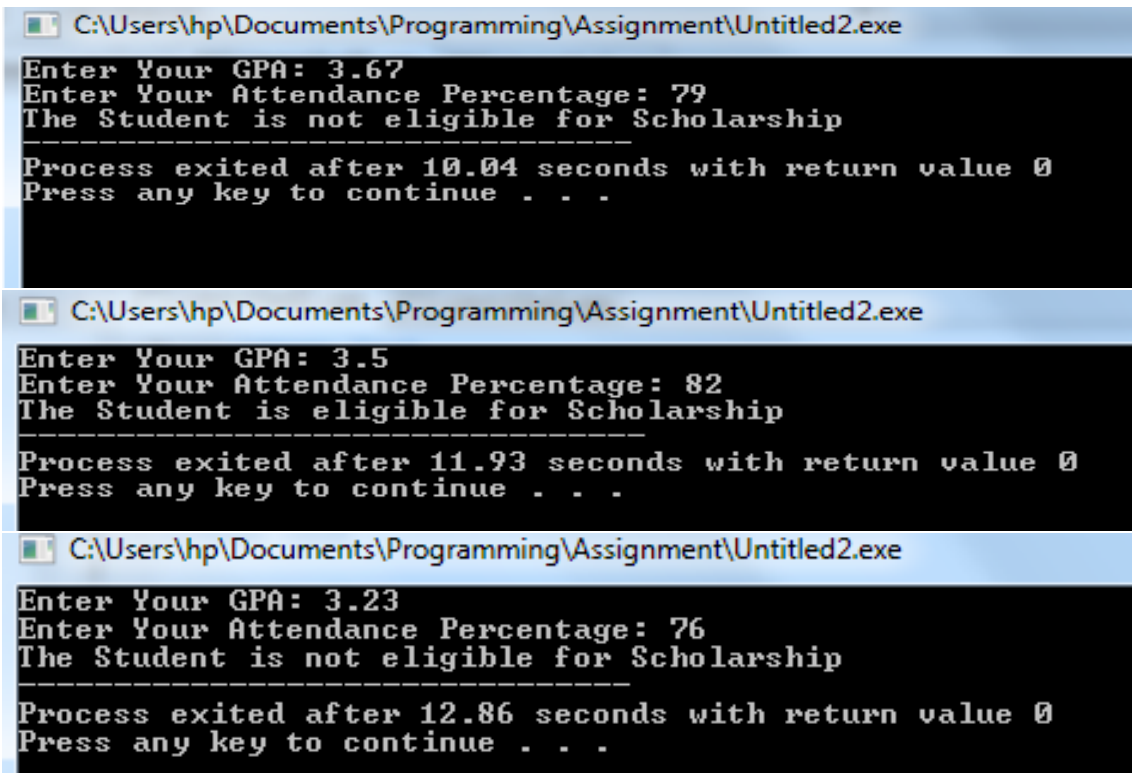
Create a C++ program that determines if a student is eligible for a scholarship based on their GPA and attendance.

Solution:

```
//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:



The image displays three sequential screenshots of a Windows command prompt window running a C++ program. Each screenshot shows the program's output for specific input values of GPA and Attendance Percentage.

Screenshot 1: The title bar shows the file path "C:\Users\hp\Documents\Programming\Assignment\Untitled2.exe". The program prompts for "Enter Your GPA:" and "Enter Your Attendance Percentage:". The user enters "3.67" and "79" respectively. The output is "The Student is not eligible for Scholarship". The process exits after 10.04 seconds with a return value of 0.

Screenshot 2: The title bar shows the same file path. The user enters "3.5" for GPA and "82" for Attendance Percentage. The output is "The Student is eligible for Scholarship". The process exits after 11.93 seconds with a return value of 0.

Screenshot 3: The title bar shows the same file path. The user enters "3.23" for GPA and "76" for Attendance Percentage. The output is "The Student is not eligible for Scholarship". The process exits after 12.86 seconds with a return value of 0.

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;
11    if(Alphabet=='A' || Alphabet=='I' || Alphabet=='O' || Alphabet=='E' || Alphabet=='U' //If The Given Character Is From The Below List
12       || Alphabet=='a' || Alphabet=='e' || Alphabet=='i' || Alphabet=='o' || Alphabet=='u'){ //Then It is A Vowel Otherwise It is A Consonant
13        cout<<"The Given Alphabet is a Vowel";
14    }
15    else {
16        cout<<"The Given Alphabet is a consonant";
17    }
18    return 0;
19 }
```

Result:

