School Of Mechanical & Manufacturing Engineering, NUST

Department of Mechanical Engineering

CS-114 - Fundamental of Programing

Lab Manual # 02

Course Instructor: Dr Jawad Khan

Lab Instructor: Muhammad Affan

Student Name: Ramzan Sameer

CMS ID: 464899

Q1. 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 and Result:

```cpp
#include<iostream>
using namespace std;
int main()
{
//  first we considered the variablex for the input purpose
    int x ;
    cout<<"please enter the marks for grade checking:   ";
    cin>>x;
//  In the following we introduce the mentioned ranges for our grades
//further we use the symbol && for the condition to be true if both are true only
    if(100>=x && x>=90){cout<<"Grade = A"<<endl;}
    if(90>x && x>=75){cout<<"Grade = B"<<endl;}
    if(75>x && x>=60){cout<<"Grade = c"<<endl;}
    if(60>x && x>=45){cout<<"Grade = D"<<endl;}
    if(45>x && x>=0){cout<<"Grade = F"<<endl;}
    return 0;

}
```

```
C:\Users\HP\Desktop\fop 2\proper shayad.exe
please enter the marks for grade checking:   56
Grade = D

--------------------------------
Process exited after 3.026 seconds with return value 0
Press any key to continue . . .
```

Q2. Write a program that takes an integer as input and determines if it is both even and divisible by 5.

Code and Result:

```cpp
#include<iostream>
using namespace std;
int main()
//first we considered the x as the input variable
{ int x;
cout<<"Please Enter a No. ";
cin>>x;
//here we again used symbol && for the condition to btrue only if both are true
//further we used logic operation if and else for executing the question statement
if(x%2==0 && x%5==0){cout<<"this is even no. and divisible by 5 ";}
else{cout<<"its not the even no. and not divisible by 5";}
return 0;
}
```

```
C:\Users\HP\Desktop\fop 2\final 2.exe
Please Enter a No. 56
its not the even no. and not divisible by 5
--------------------------------
Process exited after 3.276 seconds with return value 0
Press any key to continue . . .
```

Q3. Create a C++ program that checks if a user-provided year is a leap year.

Code and Result:

```cpp
#include<iostream>
using namespace std;
int main()
//here we again choose the 'a' as the variable for code
{
    int a;
    cout<<"enter the year to check whether its a leap year";
    cin>>a;
//  here we use if and else condition for the proper execution of the statement
    if(a%4==0){cout<<"yes its a leap year";}
    else{cout<<"no its not a leap year";}
    return 0;

}
```

```
C:\Users\HP\Desktop\fop 2\final 3.exe
enter the year to check whether its a leap year    2004
yes its a leap year
--------------------------------
Process exited after 6.881 seconds with return value 0
Press any key to continue . . .
```

Q4. 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 and result:

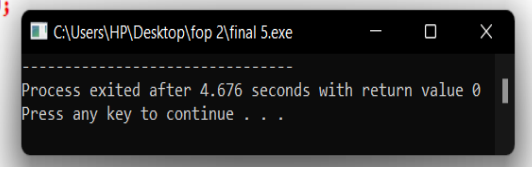
```cpp
#include<iostream>
using namespace std;
int main()
//here wea re writing code for checking whether the GPA and attendance
// obtained by the person is enough to qualify him for scholarship
{
    double a,b;
    cout<< "please enter your GPA : ";
    cin>>a;
    cout<<" please enter your attendance in percentage  :  ";
    cin>>b;
//  here same concept of && is being used
    if(a>=3.5 && b>=80){cout<<"yes you are elligebile for scholarship";}
    else{cout<<"you are not elligebile for scholarship";}
    return 0;
}
```

```
C:\Users\HP\Desktop\fop 2\final 4.exe
please enter your GPA : 3.9
 please enter your attendance in percentage  :  99.8
yes you are elligebile for scholarship
--------------------------------
Process exited after 8.416 seconds with return value 0
```

Q5. Write a program that checks if a given character is a vowel (a, e, i, o, u) or a consonant using logical operators.

Code and result:

```cpp
#include<iostream>
using namespace std;
int main()
//here we introduce a new concept of the function char and
//symbol || for finding whetaher the alphabet is vowel or consonant
{
    char x;
    cout<<"enter the character";
    cin>>x;
    if(x=='a' ||  x=='A' || x=='e' || x=='E' || x=='o' || x== 'I' || x=='i' || x == 'O'|| x=='u' || x=='U '){cout<<"its the vowel";}
else{cout<<"its a consonant";}
return 0;
}
```



Thank You!