CS-114 Fundamentals of Programming Lab Report #02

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SECTION: - A

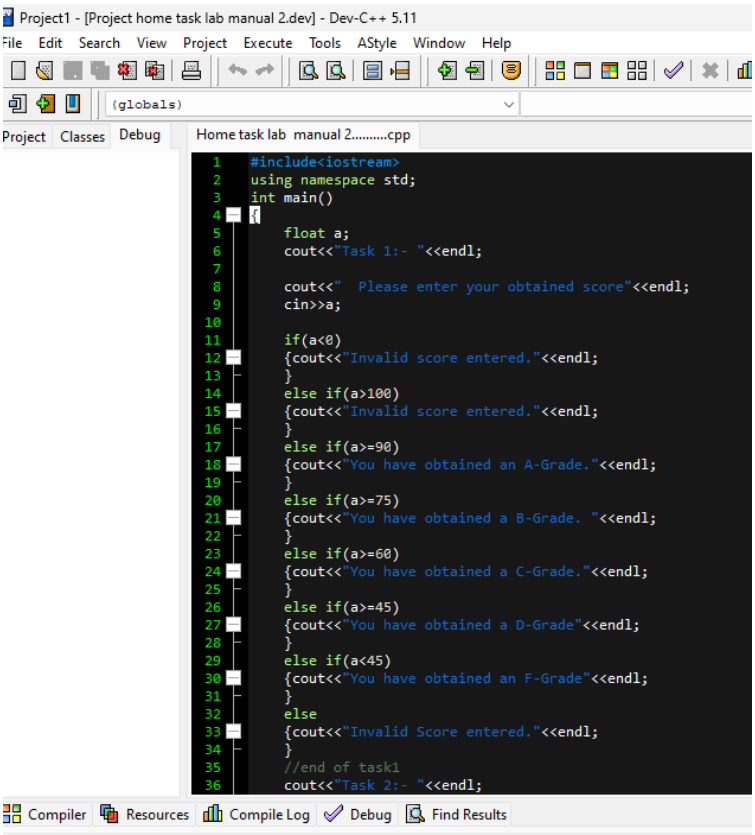
Lab Manual #02 RELATIONAL LOGIC OPERARATIONS

HOME TASK: -

(I have done every task under one function, the combined output is given in the end)

TASK1: -

In the 1st task, I had to receive input student's score from the user and assign a grade based on predefined criteria using logical operators. I used if else statements for conditions based on grading criteria. Moreover, I declared an input score of less than 0 and greater than 100 as invalid.



TASK 2: -

In task 2, I wrote a C++ program that will receive an integer as input and decided whether it's even, divisible by 5, both or none. For this, I used the % operation to find the reminder of any integer when divided by 2 and then 5. If remainder =0, then number is divisible.

```
35      //end of task1
36      cout<<"Task 2:- "<<endl;
37      int b;
38      cout<<" Enter input integer "<<endl;
39      cin>>b;
40      //the % operation, gives the remainded of any number when divided by some other number.
41      if(b % 2 == 0)
42      {
43          if(b % 5 == 0)
44          {cout<<"The provided integer is both even and divisble by 5"<<endl;}
45          else
46          {cout<<"The provided integer is only even and not divisible by 5."<<endl;}
47
48      }
49
50      else if(b % 5 == 0 )
51      {cout<<" The provided integer is only divisible by 5 and not even"<<endl;
52      }
53      else
54      {cout<<" The provided integer is nor even neither divisible by 5"<<endl;
55      }
56      //end of task 2
```

TASK 3: -

In task 3, I had to create a C++ program that would receive any year as input from the user and check whether it's a leap year or not. Every 4th year is a leap year hence by applying this definition, we can say that if any given year is divisible by 4, then it is a leap year. Moreover I declared any input less than or equal to 0 as "Invalid Year".

```
56      //end of task 2
57
58      cout<<"Task 3:-"<<endl;
59      int c;
60      cout<<"Please enter a year"<<endl;
61      cin>>c;
62
63      if(c % 4 == 0)
64      {cout<<"The provided year is a leap year"<<endl;
65      }
66      //By definition of a leap year "a year, occurring once every four years, which has 366 days".
67      //As it is every 4 years, so each leap year should be a multiple of 4.
68      else if(c<=0)
69      {cout<<"INVALID YEAR ENTERED"<<endl;
70      }
71      //As the AD  calender year can't be in negatives or 0
72      else
73      {cout<<"The year provided by the user is not a leap year"<<endl;
74      }
75
76      //end of task 3
```

TASK 4: -

In task 4, I must create a C++ program that will receive the GPA and attendance percentage of a student and decide whether the student is eligible for scholarship or not.

The valid input values of GPA are 0-4 and the valid input values of attendance percentage is 0-100, so keeping those constraints in perspective, I set up the program so it would give a disclaimer for any invalid value of GPA or school attendance when entered.

I used OR gates and AND gates in if else statements.

```
    //end of task 3
    float G, A;

    cout<<"TASK 4 :-     "<<endl;

    cout<<"Please enter your GPA "<<endl;
    cin>>G;

    cout<<"Please enter your attendence percentage"<<endl;
    cin>>A;

    if((G<0||G>4) && (A<0||A>100))
    {cout<<"Invalid GPA and Attendence entered"<<endl;
    }
    //the above conditional statement covers all constraints that make the program invalid using gate AND gates and OR gates
    else if(G>4 || G<0)
    {cout<<"Invalid GPA entered"<<endl;
    }
    else if (A>100 || A<0)
    {cout<<"Invalid Attendence percentage entered"<<endl;
    }
    //After the commands to invalid with values entered, the bottom lines deal with assinging the student with a scholarship based on the conditions
    else if(G>=3.5)
    {

        if (A>=80)
        {cout<<"The student is eligible for a scholarship"<<endl;
        }

        else
        {cout<<"The student is not eligible for a scholarship due to low Attednence"<<endl;
        }

    }
```

```
    else if(G>=3.5)
    {

        if (A>=80)
        {cout<<"The student is eligible for a scholarship"<<endl;
        }

        else
        {cout<<"The student is not eligible for a scholarship due to low Attednence"<<endl;
        }

    }
    else if(G<3.5)
    {


        if(A<80)
        {cout<<"The student is not eligible for a scholarship due to both low Attendence and low GPA"<<endl;
        }

        else
        {cout<<"The student is not eligible for a scholarship due to low GPA"<<endl;
        }

    }

    //end of task 4
```

TASK: - 5

In the 5th task, I must create a program in C++, that will check if a given character is a vowel (a, I, e, o, u) or a consonant using logical operators. I used or gates and if else conditions to print out different outputs.

```
    //end of task 4



    char character;
    cout<<"Task 5:-"<<endl;

    cout<<"Enter the character "<<endl;
    cin>>character;
    //by using char we can assign any letter to "character" whether capital or lower case
    //or gates make it so that the statement if anyone of the conditions is true, henceforth covering all the consonants.
    // == sign is used to check if character is equal to the given letter or not.
    if (character == 'a' || character == 'e' || character == 'i' || character == 'o' || character == 'u')
    {cout<<"Your character is a lowercase vowel"<<endl;
    }

    else if (character == 'A' || character == 'E' || character == 'I' || character == 'O' || character == 'U')
    {cout<<"Your character is an uppercase vowl"<<endl;
    }

    else
    {cout<<"Your character is a consonant"<<endl;
    }

    return 0;
}
```

OUTPUTS OF ALL TASKS: -

As all my tasks were under one function, so the combined output is given by the following screenshot;

```
C:\Users\TEMP\Desktop\Project home task lab manual 2.exe
Task 1:-
  Please enter your obtained score
69
You have obtained a C-Grade.
Task 2:-
 Enter input integer
50
The provided integer is both even and divisble by 5
Task 3:-
Please enter a year
2004
The provided year is a leap year
TASK 4 :-
Please enter your GPA
3.9
Please enter your attendence percentage
79
The student is not eligible for a scholarship due to low Attednence
Task 5:-
Enter the character
R
Your character is a consonant

--------------------------------
Process exited after 31.38 seconds with return value 0
Press any key to continue . . .
```

If any invalid value is entered, the program will output a statement indicating that the value is invalid.

.END.