CSS-114- FUNDAMENTALS OF PROGRAMMING

LAB MANUAL #3

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Lab Task:

1. Write a program that determines if a person is eligible to vote based on their age (e.g., 18 years or older) using logical operators.

CODE:

CLASS TASK 2.cpp

```cpp
#include<iostream>
using namespace std;

int main(){

    cout<<"LAB TASK 1"<<endl;
    int number;
    // Input an age from the user
    cout<<"Enter your age:";
    cin>>number;
    //check if age is valid
    if (number<=0) {
        cout<<"The Age Entered was Invalid."<<endl;
    }
    //check if the person is eligible to vote based on age
     else{
     if (number >= 18){
         cout<<"You are eligible to vote"<<endl;
    }
    else {
        cout<<"You are not eligible to vote"<<endl;}
    }
```

CODE RESULT:

```
LAB TASK 1
Enter your age:23
You are eligible to vote
```

2. Write a program that takes an integer as input and checks if it falls within the range [10, 50] using logical operators.

CODE:

```
    cout<<"LAB TASK 2"<<endl;
    int integer;
    //Input a number from the user
    cout<<"Enter your Integer:";
    cin>>integer;
    // Check if the number is equal to or greater than 10 AND equal to or less than 50
    if (integer >= 10 && integer <= 50){
        cout<<"The Number lies in the range [10,50]."<<endl;
}
    else {
      cout<<"The Number does not lie in the range [10,50]."<<endl;
    }
```

CODE RESULT:

```
LAB TASK 2
Enter your Integer:51
The Number does not lie in the range [10,50].
```

3. Write a C++ program to compare two integers and find the maximum value.

```
cout<<"LAB TASK 3"<<endl;
int a, b;
// Input two integer values from the user
cout<<"Enter the two values to be compared:";
cin>>a>>b;
// Check which value is greater
if (a>b){
    cout<<"The maximum value is:"<<a<<endl;
}
else{
    if (b>a){
        cout<<"The maxiumum value is:"<<b<<endl;
    }
}
```

CODE RESULT:

```
LAB TASK 3
Enter the two values to be compared:43
56
The maxiumum value is:56
```

4. Write a C++ program to calculate the average of three exam scores and determine if it's above a passing grade (e.g., average >= 60).

CODE:

```
    cout<<"TASK 4"<<endl;
    float X, Y, Z, AVG;
    // Enter 3 exam scores from the user
    cout<<"Enter your exam scores:";
    cin>>X>>Y>>Z;
    // Formula for calculating average score
    AVG= (X+Y+Z)/3;

    cout<<"The Average score is:"<<AVG<<endl;
    //Check if value is equal to or greater than 60, the passing grade.
    if (AVG)
    if (AVG>=60){
        cout<<"The Average is above the passing grade."<<endl;
    }
    else {
        cout<<"The Average is not above the passing grade."<<endl;
    }

    return 0;
}
```

CODE RESULT:

```
TASK 4
Enter your exam scores:67.9
100
48
The Average score is:71.9667
The Average is above the passing grade.

--------------------------------
Process exited after 38.96 seconds with return value 0
Press any key to continue . . .
```

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 (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(){

    cout<<"HOME TASK 1"<<endl;
    float marks;
    //Inpur marks from the user
    cout<<"Enter your Marks."<<endl;
    cin>>marks;
    // Check which grade correspondes to the marks depending on the grading system
    if (marks<=100 && marks>=90){
        cout<<"Result: A Grade."<<endl;
    }
    if (marks <90 && marks>=75){
        cout<<"Result: B Grade."<<endl;
    }
    if (marks<75 && marks>= 60){
        cout<<"Result: C Grade."<<endl;
    }
    if (marks<60 && marks>=45){
        cout<<"Result: D Grade"<<endl;
    }
    if (marks<45 && marks >=0){
        cout<<"Result: F Grade"<<endl;
    }
    return 0;
}
```

CODE RESULT:

```
HOME TASK 1
Enter your Marks.
89.99
Result: B Grade.

--------------------------------
Process exited after 15.18 seconds with return value 0
Press any key to continue . . .
```

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(){

    cout<<"HOME TASK 2"<<endl;
    int P;
    //Input an integer from the user
    cout<<"Enter your number"<<endl;
    cin>>P;
    //Check if the number is even and divisible by 5
    if (P % 2 == 0 && P % 5 == 0) {
        cout<<"The number is even and divisible by 5."<<endl;
    }
    //Check if the number is even and not divisible by 5
    if (P % 2 == 0 && P % 5 != 0 ){
        cout<<"The number is even but not divisible by 5."<<endl;
    }
    //Check if the number is not even and divisible by 5
    if (P % 2 != 0 && P % 5 == 0) {
    cout<<"The number is not even but divisible by 5."<<endl;
}
    //Check if the number is not even and not divisible by 5
    if (P % 2 != 0 && P % 5 != 0) {
        cout<<"The number neither even nor divisible by 5."<<endl;
}
return 0;
```

CODE RESULT:

```
HOME TASK 2
Enter your number
35
The number is not even but divisible by 5.

--------------------------------
Process exited after 14.05 seconds with return value 0
Press any key to continue . . .
```

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

CODE:

```
#include<iostream>
using namespace std;
int main(){

        cout<<"HOME TASK 3"<<endl;
        int Year;
        // Input a year from the user
        cout<<"Enter your Year."<<endl;
        cin>>Year;
        //Check if year is divisible by 4, since leap years arise every 4 years
        if (Year % 4 == 0){
            cout<<"This Year was a Leap Year."<<endl;}
            else{
                cout<<"This Year was not a Leap Year."<<endl;
            }
        return 0;

}
```

CODE RESULT:

```
HOME TASK 3
Enter your Year.
2012
This Year was a Leap Year.

--------------------------------
Process exited after 18.28 seconds with return value 0
Press any key to continue . . .
```

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(){

    cout<<"HOME TASK 4"<<endl;
    float GPA, att;
    // Input a GPA from the user
    cout<<"What is your GPA?"<<endl;
    cin>>GPA;
    // Input a number of classes, out of 16, from the user
    cout<<"How Many Classes out of 16 did you attend?"<<endl;
    cin>>att;
    // Check if GPA is greater than or equal to 3.5 and if Attendance is at least 80%
    if (GPA >= 3.5 && att>=12.8){
        cout<<"Congratulations! You are Eligible for the Scholarship."<<endl;
    }
        else {
            cout<<"We are Sorry to inform you that you are Not Eligible for the Scholarship."<<endl;
        }
        return 0;
    }
```

CODE RESULT:

```
HOME TASK 4
What is your GPA?
3.6
How Many Classes out of 16 did you attend?
13
Congratulations! You are Eligible for the Scholarship.

--------------------------------
Process exited after 16.67 seconds with return value 0
Press any key to continue . . .
```

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(){

    cout<<"HOME TASK 5"<<endl;

     char Char;
     // Input a character from the user
    cout<<"Enter your Character."<<endl;
    cin>>Char;
    //Check if the character is a vowel or not (a,e,i,o,u)
    if (Char=='a' || Char=='e' || Char=='i' || Char=='o' || Char=='u'){
        cout<<"The Character is a Vowel."<<endl;}
        else{
            cout<<"The Character is not a Vowel."<<endl;
        }
    return 0;
}
```

CODE RESULT:

```
HOME TASK 5
Enter your Character.
o
The Character is a Vowel.

--------------------------------
Process exited after 14.91 seconds with return value 0
Press any key to continue . . .
```