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CLASS:ME – 15C

LAB MANUAL 1:

INTRODUCTION;

In this manual the tasks consisted mainly of taking user input and performing various basic arithmetic functions on them and displaying their final values.Arithmetic operators like ' **+** ' , ' **-** ' , ' **/** ', ' ***** ' were used to represent addition, subtraction, division and multiplication to carry out the given tasks.

HOMETASKS

TASK 1:

Code:

```
#include <iostream>

using namespace std;
//hometask 1
int main() {
   int x1,x2,y1,y2,d,dy,dx;
   //taking user input for co-ordinates
   cout << "Enter the x co-ordinate of the first point" << endl;
   cin >> x1;
   cout << "Enter the y co-ordinate of the first point" << endl;
   cin >> y1;
   cout << "Enter the x co-ordinate of the second point" << endl;
   cin >> x2;
   cout << "Enter the y co-ordinate of the second point" << endl;
   cin >> y2;
   dx = x2 - x1;//the difference between x co-ordinates
   dy = y2 - y1;//the difference between y co-ordinates
   d = (dx*dx) + (dy*dy);//using the distance formula from lab manual
   cout << "The distance betweeen points is:" << d;
   return 0;
}
```

Output:

```
Enter the x co-ordinate of the first point
1
Enter the y co-ordinate of the first point
2
Enter the x co-ordinate of the second point
3
Enter the y co-ordinate of the second point
4
The distance betweeen points is:8
```

TASK 2:

Code

```cpp
#include <iostream>

using namespace std;
//hometask 2
int main() {
   float cm,m,km;
   //taking user input for length in cm
   cout << "Enter length in centimeters" << endl;
   cin >> cm;
   m = cm/100;//centimeter to meter conversion
   km = m/1000;//meter to centimeter conversion
   cout << "The length in meters is:" << m <<"m" <<endl;
   cout << "The length in kilometers is:" << km <<"km" << endl;
}
```

Output:

```
Enter length in centimeters
500
The length in meters is:5m
The length in kilometers is:0.005km
```

TASK 3:

Code:

```cpp
#include <iostream>

using namespace std;
//hometask 3
int main() {
   int a,b,px;
   //taking user input for a and b
   cout << "Enter the value for 'a':" << endl;
   cin >> a;
   cout << "Enter the value for 'b':" << endl;
   cin >> b;
   px = (a*a) + 2*a*b + (b*b);// polynomial equation
   cout << "The result of polynomial is:" << px;

}
```

Output:

```
Enter the value for 'a':
2
Enter the value for 'b':
3
The result of polynomial is:25
```

TASK 4:

Code:

```cpp
#include <iostream>

using namespace std;

//hometask 4
int main() {
   float c1,C,F;
   //taking user input for temperature in Fahrenheit
   cout << "Enter temperature in degree Fahrenheit:" << endl;
   cin >> F;
   c1 = (F - 32)*5;//applying the conversion formula without the division
   C = c1/9;//completing the conversion

   cout << "The temperature in Degree Celsius is:" << C << "C";

}
```

Output:

```
Enter temperature in degree Fahrenheit:
55
The temperature in Degree Celsius is:12.7778C
```

LAB MANUAL 2:

INTRODUCTION:

This manual required us to do tasks involving if-else statements along with making thorough use of both logical and relational operators.Logical operators like '&&' , '||' , '!', were used to represent AND, OR, and NOT logic.Furthermore relational operators such as '<=' , '>=' , '==' , '!=', were also used to represent less than, greater than, equal to and not equal to relations to complete these tasks.

LAB TASK 1:

Code:

```cpp
#include <iostream>

using namespace std;
//labtask1-manual2
int main()
{
 int age;
 cout << "Enter your age:\n";
 cin >> age;
 if (age >= 18){
    cout << "You are eligible to vote!";
 }
 else cout << "You are not eligible to vote!";

    return 0;
}
```

Output:

```
Enter your age:
15
You are not eligible to vote!
```

```
Enter your age:
19
You are eligible to vote!
```

LAB TASK 2:

Code:

```cpp
#include <iostream>

using namespace std;
//labtask2-manual2
int main()
{
int num;
cout << "Enter the number:" << endl;
cin >> num;
if (num >= 10 && num <= 50)// checking for range [10,50] using AND operator
{
    cout << "The number falls within range!";


}
else{
    cout << "The number falls outside the range!";
}

    return 0;
}
```

Output:

```
Enter the number:
9
The number falls outside the range!
```

```
Enter the number:
45
The number falls within range!
```

```
Enter the number:
60
The number falls outside the range!
```

LAB TASK 3:

Code:

```cpp
#include <iostream>

using namespace std;
//labtask3-manual2
int main()
{
int num1,num2;
cout << "Enter the first number:" << endl;
cin >> num1;//taking input 1
cout << "Enter the second number:" << endl;
cin >> num2;//taking input 2
if (num1 > num2){ // comparing the 2 numbers
    cout << num1 << " is greater";

}
else {
    cout << num2 << " is greater";
}

    return 0;
}
```

Output:

```
Enter the first number:
5
Enter the second number:
2
5 is greater
```

LAB TASK 4:

Code:

```
#include <iostream>

using namespace std;
//labtask4-manual2
int main()
{
int m1,m2,m3,avg;
//taking user input
cout << "Enter the first exam score:\n";
cin >> m1;
cout << "Enter the second exam score:\n";
cin >> m2;
cout << "Enter the third exam score:\n";
cin >> m3;

avg = (m1 + m2 + m3)/3;// calculating the average
cout << "Your average is: " << avg << endl;
if (avg >= 60){ //passing grade is takn as 60
    cout << "You have passed!";
}
else {
```

```
else {
    cout << "You have failed!";
}

    return 0;
}
```

Output:

```
Enter the first exam score:
60
Enter the second exam score:
70
Enter the third exam score:
90
Your average is: 73
You have passed!
```

```
Enter the first exam score:
40
Enter the second exam score:
50
Enter the third exam score:
60
Your average is: 50
You have failed!
```

HOMETASKS

TASK 1:

Code:

```cpp
//hometask1-manual2
int main()
{
int score;
//taking user input
cout << "Enter your exam score:\n";
cin >> score;
if (score >= 90){ // maximum score is 100 hence no need for upper limit
    cout << "Your grade is: A";
}
else if (score >= 75 && score < 90){
    cout << "Your grade is: B";
}
else if (score >= 60 && score < 75){
    cout << "Your grade is: C";
}
else if (score >= 45 && score < 60){
    cout << "Your grade is: D";
}
else if (score < 45){// minimum score is 0 hence no need for lower limit
    cout << "Your grade is: F";
}
    return 0;
}
```

Output:

```
Enter your exam score:
44
Your grade is: F

...Program finished with exit code 0
Press ENTER to exit console.
```

```
Enter your exam score:
63
Your grade is: C
```

TASK 2:

Code:

```cpp
#include <iostream>

using namespace std;
//hometask2-manual2
int main()
{
int num;

//taking user input
cout << "Enter the number:\n";
cin >> num;
if (num % 5 == 0 && num % 2 == 0){//for numbers that are divisible by both
    cout << "number is even and divisible by 5";
}
else if (num % 5 == 0 && num % 2 != 0){//for numbers that are only divisible by 5
    cout << "number is odd and divisible by 5";
}
else if (num % 5 != 0 && num % 2 == 0){//for numbers that are only divisible by 2
    cout << "number is even but not divisible by 5";
}
else if (num % 5 != 0 && num % 2 != 0) {//for numbers that arent divisible by either
    cout << "number is not even and not divisible by 5";
}

    return 0;
}
```

Output:

```
Enter the number:
50
number is even and divisible by 5
```

```
Enter the number:
45
number is odd and divisible by 5
```

```
Enter the number:
2
number is even but not divisible by 5
```

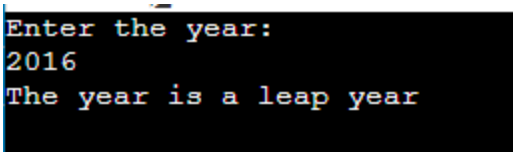
```
Enter the number:
43
number is not even and not divisible by 5
```

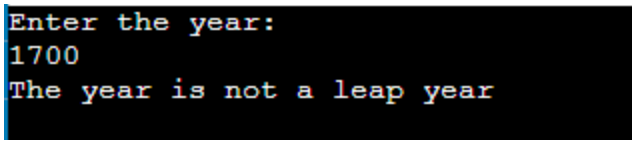
TASK 3:

Code:

```cpp
#include <iostream>

using namespace std;
//hometask3-manual2
int main()
{
int year;
//taking user input
cout << "Enter the year:\n";
cin >> year;
if (year % 100 != 0 && year % 4 == 0){//all years except century years that are divisible by 4 are leap years
    cout << "The year is a leap year";

}
else if (year % 100 == 0 && year % 400 == 0){/*only those century years that are divisible by both 100 & 400
                                               are leap*/
    cout << "The year is a leap year";
}
else cout << "The year is not a leap year";
    return 0;
}
```

Output:





TASK 4:

Code:

```cpp
#include <iostream>

using namespace std;
//hometask4-manual2
int main()
{
float gpa,tclass,classattend,pattend;/*tclass=total number of classes, classattend=classes attended,
pattend = attendance percentage*/
//taking user input
cout << "Enter your GPA:\n";
cin >> gpa;
cout << "Enter your total number of classes:\n";
cin >> tclass;
cout << "Enter the number of classes you attended:\n";
cin >> classattend;
pattend = (classattend/tclass)*100;
if (pattend >= 80 && gpa >= 3.5){
    cout << "You are eligible for scholarship";
}


else cout << "You are not eligible for scholarship";
    return 0;
}
```

Output:

```
Enter your GPA:
3.7
Enter your total number of classes:
10
Enter the number of classes you attended:
9
You are eligible for scholarship
```

```
Enter your GPA:
3.4
Enter your total number of classes:
10
Enter the number of classes you attended:
2
You are not eligible for scholarship
```

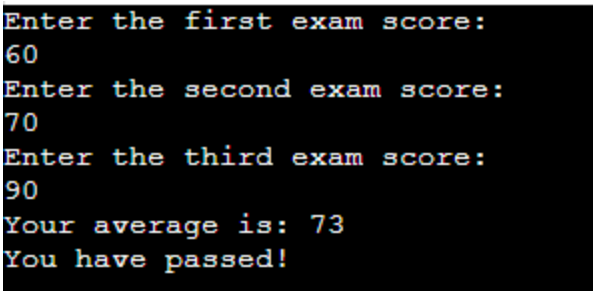
```
Enter your GPA:
3.7
Enter your total number of classes:
10
Enter the number of classes you attended:
2
You are not eligible for scholarship
```

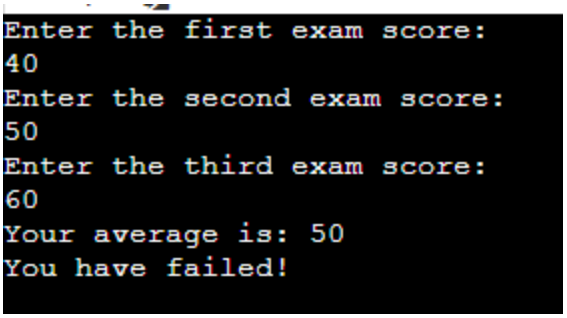
TASK 4:

Code:

```cpp
#include <iostream>

using namespace std;
//hometask5-manual2
int main()
{
char letter;
//taking user input
cout << "Enter a letter:\n";
cin >> letter;

if (letter == 'a' || letter == 'e' || letter == 'i' || letter == 'o' || letter == 'u'){
//Using OR logic operator
    cout << "The letter is a vowel";
}


else cout << "The letter is a consonant";
    return 0;
}
```

Output:


Enter the first exam score:
60
Enter the second exam score:
70
Enter the third exam score:
90
Your average is: 73
You have passed!


Enter the first exam score:
40
Enter the second exam score:
50
Enter the third exam score:
60
Your average is: 50
You have failed!