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## ***Lab. (5)***

### ***Control Structures***

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*Answer the following questions*

- 1) Write a program that inputs a four-digit integer at maximum, separates the integer into its digits and prints them separated by three spaces each. For example, if the user types in 5386, the program should print: 5 3 8 6.
- 2) Write a program that prompts the user to input three numbers. The program should then output the numbers in descending order then find largest number.
- 3) Write a program that prompts the user to input a number. The program should then output the number and a message saying whether the number is positive, negative, or zero.
- 4) Write a C++ program that reads a set of integers and then prints the sum of the even numbers.
- 5) Write the following program: The user is asked to enter 2 floating point numbers (use doubles). The user is then asked to enter one of the following mathematical symbols +, -, \*, or /. The program computes the answer on the two numbers the user entered and prints the results. If the user enters an invalid symbol, the program should print nothing.
- 6) Write a C++ program that calculate the average of numbers entered by user (three numbers at least). If user enters negative number, it ignores the number and calculates the average of number entered before it.

- 7) Write a C++ program to read temperature in centigrade and display a suitable message according to temperature state below : Temp < 0 then Freezing weather, Temp 0-10 then Very Cold weather, Temp 10-20 then Cold weather, Temp 20-30 then Normal in Temp, Temp 30-40 then It's Hot, Temp >=40 then It's Very Hot
- 8) Write a C++ program that reads an 8-bit binary number (b7 b6 b5 b4 b3 b2 b1 b0) from the user then performs the shift left operation according to the shift value specified by the user.
- 9) Write a C++ program that reads an 8-bit binary number (b7 b6 b5 b4 b3 b2 b1 b0) from the user then performs the shift right operation according to the shift value specified by the user.
- 10) Write a C++ program that reads a guest balance from the user for a guest which his balance (0:10000) as an input argument. The program yields the interest rate according to the following table:

balance	Interest rate
5000 <= balance <= 10000	7 %
2500 <= balance < 5000	5 %
1000 <= balance < 2500	3 %
100 <= balance < 1000	2 %
balance < 100	0 %

- 11) Write a C++ program to calculate the sum and average for a group of (n) numbers (max value of n=5). The program will ask the user to enter (n) and then enter each number.
- 12) Write a C++ program to establish a password consists of seven numbers for the treasury of a factory. In the case of entering correct password, a message will appear to the user (Treasury ready to open). Whereas in case of entering incorrect password, a message will appear to the user (sorry, try again). The program permits the user to enter incorrect password for only 3 times then terminates. Remark a password is (2385110).

13) Write a C++ program that displays the following menu:

1. convert from Celsius to Fahrenheit
2. convert from Celsius to Kelvin
3. convert from Kelvin to Celsius
4. convert from Fahrenheit to Celsius

The program should first ask the user to select a converter (1 or 2 or 3 or 4). If for example the user enters 2 then the program will ask the user to “enter the temperature in Celsius” and then calculates the temperature in Kelvin and displays this on the screen “temperature in Kelvin = “.

$$\begin{aligned} \text{Kelvin} &= \text{Celsius} + 273 \\ \text{Fahrenheit} &= (\text{Celsius} * 9/5) + 32 \end{aligned}$$

14) Write a C++ program that ask the user to enter a number with any value. The program then checks the value of the entered number if the value is in between 0 and 100 (both included) the program prints “in range” otherwise the program prints “out of range”.

15) Write a C++ program that ask the user to enter the value of two numbers. Then the program checks the values entered, if the two numbers are same print “the same” on the screen and terminates the program, otherwise print “not equal” on the screen and ask the user to enter the two numbers again. The program permits the user to enter unequal numbers for only 3 times then terminates.

16) Write a program that will display a list of products:

- |                 |               |                |
|-----------------|---------------|----------------|
| 1- Honey (40LE) | 2- Tea (10LE) | 3- Sugar (5LE) |
| 4- Meat (90LE)  | 5- Salt (2LE) | 6- Oil (10LE)  |

And ask the user to enter the product number plus how many of it, (note: the user can select more than one product). Finally, the program will stop and out the total price if the user enters 0 at the product number.

17) Select one of the choices (a, b, c, d) that best suites the given statement:

a) if (60 <= 12 \* 5)

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cout << "Hello";  
cout << " There";  
outputs the following:
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(a) Hello There    (b) Hello    (c) Hello    (d) There There

b) if (5 < 3)

```
cout << " *";  
else if (7 == 8)  
cout << "&";  
else  
cout << "$";  
outputs the following:
```

(a) \*                      (b) &                      (c) \$                      (d) none of these

18) What is the output of the following C++ program?

```
int myNum = 10;  
int yourNum = 30;  
if (yourNum % myNum == 3)  
{  
yourNum = 3;  
myNum = 1;  
}  
else if (yourNum % myNum == 2)  
{  
yourNum = 2;  
myNum = 2;  
}  
else  
{ yourNum = 1;  
myNum = 3; }  
cout << myNum << " " << yourNum << endl;
```