152112011 Computer Programming LAB

LAB WORK 4

29 March 2022

Objectives:

- C++ Programming Pointers
- C++ File name is **StudentID_qNO.cpp**
- Note: Write comments in your code for explaining steps.
- Note: Pay attention to the indentations in your code.

Question 1: Write a program in C++ to demonstrate how to handle the pointers.

Sample Output:

```
Now ab is assigned with the address of m.
Address of pointer ab : 0x7ffcc3ad291c
Content of pointer ab : 29

The value of m assigned to 34 now.
Address of pointer ab : 0x7ffcc3ad291c
Content of pointer ab : 34

The pointer variable ab is assigned with the value 7 now.
Address of m : 0x7ffcc3ad291c
Value of m : 7
```

Question 2: Write a program in C++ to demonstrate the use of & (address of) and *(value at address) operator.

Sample Output:

```
Pointer : Demonstrate the use of & and * operator :
-----------------------------------------------------
 m = 300
 fx = 300.600006
 cht = z

 Using & operator :
-----------------------
 address of m = 0x7ffda2eeeec8
 address of fx = 0x7ffda2eeeecc
 address of cht = 0x7ffda2eeeec7

 Using & and * operator :
----------------------------
 value at address of m = 300
 value at address of fx = 300.600006
 value at address of cht = z

Using only pointer variable :
---------------------------------
 address of m = 0x7ffda2eeeec8
 address of fx = 0x7ffda2eeeecc
 address of cht = 0x7ffda2eeeec7

 Using only pointer operator :
---------------------------------
 value at address of m = 300
 value at address of fx= 300.600006
 value at address of cht= z
```

Question 3: Write a program in C++ using pointers to give same output like sample output.

Sample Output:

```
address of a: 61fe9c
address of p: 61fe98
address of pp: 61fe94
value stored at a: 10
value stored at p: 61fe9c
value stored at pp: 61fe98
a reference to: 10
p reference to: 10
pp reference to: 10
```

Question 4: Write a program that takes an input from the user and calculates the factorial of given value and prints the result on screen. Follow the given restrictions.

- You can use at most 2 variables; "n" to store input value and "r" to store result value.
- You must implement a function that calculates factorial of given input value n.
- You must take n from user.
- The function must take 2 input parameters which are n and r.
- The function DOES NOT return any value (you must find out your way to solve this challenge).
- You must print your steps in **"main" function.**

Sample:
- Enter the number: 5
- Factorial of 5 is: 120

Question 5: Write a program according to the given constraints.
Suppose that "n", "max" and "sum" are integer values.
The sum has an initial value of 0. The max has an initial value of 50.

- Get input n from the user and check:
  - If n is greater than the current value of the sum, add n to the sum.
  - If n is less than the current value of the sum, subtract n from the sum.
  - Keep doing these steps until the sum value reaches or exceeds the max value.
- To perform the given steps, you must define a function called "check".
  - The function is only in charge of comparing (n, sum) and performing the necessary actions given above.
  - The function DOES NOT return anything.
- You must print your steps in **"main" function.**

Sample:
- Max = 50, Sum = 0
  - N = 10; Sum = 10
  - N = 5; Sum = 5
  - N = 8; Sum = 13
  - N = 30; Sum = 43
  - N = 23; Sum = 20
  - N = 40; Sum = 60 (exceeded 50)
  - End...

Question 6: Write a program that finds the length of a user-defined number. Follow the given restrictions.

- You can use only two variables; "n" to store the value received from the user and "count" to store the length of the n.
- You must define a function called "check" to implement your algorithm in it.
- The function DOES NOT return anything.
- The function takes two input n and count.
- You must print the result in **"main" function.**