

# CL1002 – Programming Fundamentals Lab

## Exercise # 06

### Note:

- Submit a pdf file containing all of your C code with all possible screenshots of every task outputs on Google Classroom.
- Copied task will be awarded **zero** marks.
- Note that these lab task marks could be graded through a viva in lab.
- Please submit your file in this format (roll-no-name) i.e (22P-8743-Zain.pdf).

### Problem: 1

Write a C program that prints the following patterns separately one below the other.

Use nested for loop to generate the patterns.

### Sample Output:

*****	*
****	**
***	***
**	****
*	*****

### Problem: 2

Write a C function to construct the following pattern, using a for loop. User should enter a symbol e.g \*, ^, @, - etc, and your function should a pattern like this of that symbol

### Sample Output:

Enter symbol #

```
#
##
###
####
#####
####
###
##
#
```

Enter symbol \*

```
*
**
***
****
*****
****
***
**
*
```

### Problem: 3

Write a Program that takes 'n' and 'x' from user and computes the following series.

**Note:** don't use built in pow function.

$$S = \sum_{k=0}^n x^k / k!$$

#### Sample Output

```
Enter the value for n 5
Enter the value for x 3
18.4
```

### Problem: 4

A "Perfect" number is a positive whole number that is the sum of its proper divisors (including 1 and excluding the number itself). For example, the proper divisors of 6 are 1, 2, 3 and  $1 + 2 + 3 = 6$ . So, 6 is a perfect number. Similarly, 28 is also a perfect number.

Write a program that displays first 4 perfect numbers.

#### Sample Run:

6 is a perfect number

$1+2+3=6$

28 is a perfect number

$1+2+4+7+14=28$

## Additional Task

### Problem: 5

Write a C function to construct the following pattern, using a for loop. User should enter a symbol e.g \*, ^, @, - etc, the number of rows and your function should a pattern like this of that symbol.

**Sample Output:**

```
Enter the number of rows 5
Enter symbol $
  $
 $$$
$$$$$
$$$$$$$
$$$$$$$$$
```

```
Enter the number of rows 7
Enter symbol @
  @
  @@@
 @@@@
@@@@@
@@@@@@
@@@@@@@
@@@@@@@@
```

### Problem: 6

Write a C function to construct the following pattern, using a loop.

**Sample Output**

```
Enter the number of rows: 7
  0
  1 1
 2 2 2
3 3 3 3
4 4 4 4 4
5 5 5 5 5 5
6 6 6 6 6 6 6
7 7 7 7 7 7 7 7
6 6 6 6 6 6 6
5 5 5 5 5 5
4 4 4 4 4
3 3 3 3
2 2 2
1 1
0
```