

## CL2001 – Data Structure Lab

### Exercise # 08

**Note:**

- Copied task will be awarded **zero** marks.
- Use comments wherever applicable.
- Note that these lab task marks could be graded through a viva in lab.
- Variables and functions names should be meaningful.

#### Problem: 1 | Power of Four

Given an integer  $n$ , return true if it is a power of four. Otherwise, return false.

An integer  $n$  is a power of three, if there exists an integer  $x$  such that  $n == 4^x$ .

**Example 1:**

**Input:**  $n = 16$

**Output:** true

**Example 2:**

**Input:**  $n = 5$

**Output:** false

**Example 3:**

**Input:**  $n = 1$

**Output:** true

#### Problem: 2 | Power of Four using Recursion

Perform the Problem 1 using recursion.



### Problem: 3 | Multiply two numbers using Recursion

Write a function for multiply(a, b), where a and b are both positive integers, but you can only use the + or - operators.

**Note:** Use Recursion to solve the above problem.

### Problem: 4 | Power of Three

Given an integer n, return true if it is a power of three. Otherwise, return false.

An integer n is a power of three, if there exists an integer x such that  $n == 3^x$ .

#### Example 1:

Input: n = 27

Output: true

#### Example 2:

Input: n = 0

Output: false

#### Example 3:

Input: n = 9

Output: true

**Note:** Use Recursion to solve the above problem.