Programming and Data Structures Lab (CS2710)
Assignment-05: *Stack and Queue*

Lab-work:

1. Implement Stack ADT using both – (i) Array and (ii) Linked List
   Operations: (a) Is-Empty, (b) Is-Full, (c) Push, (d) Pop, (e) Find-Element
   Hint: Use structures, assume that the stack contains integer elements, may take help of top pointer while implementing using array

2. Implement Queue ADT using both – (i) Array and (ii) Linked List
   Operations: (a) Is-Empty, (b) Is-Full, (c) Enqueue, (d) Dequeue, (e) Find-Element
   Hint: Use structures, assume that the queue contains integer elements, may take help of front and rear pointers while implementing using array

- -

Home-work:

1. Implement Stack ADT and write the following programs using Stack ADT operations:

   (a) Evaluate a Postfix Expression
   Inputs: A postfix expression over integer terms
   Outputs: The evaluated value
   Example: Input = 6 2 3 + - 3 8 2 / + * 2 ^ 3 + => Output = 52 (^ : to-the-power)

   (b) Convert an Infix Expression to Postfix Expression
   Inputs: An infix expression
   Outputs: The corresponding postfix expression
   Example: Input1 = A + B * C => Output1 = A B C * +
   Input2 = (A + B) * C => Output2 = A B + C *

2. Implement:

   (a) Stack ADT using only Queue ADT operations (isEmpty, isFull, Enqueue, Dequeue), and
   (b) Queue ADT using only Stack ADT operations (isEmpty, isFull, Push, Pop)