**King Fahd University of Petroleum & Minerals**

**College of Computer Science and Engineering**

**Information and Computer Science Department**

**ICS 202 – Data Structures**

# Recursion

**Objectives**

The objective of this lab is to design and implement recursive programs.

**Outcomes**

After completing this Lab, students are expected to:

• Design recursive solutions.

• Implement recursive methods.

**Lab Tasks**

1. (a) Comment the iterative **public boolean contains(Element e)** method of the given **SLL<T>** class then

implement it as a recursive method. Use an appropriate helper method in your solution.

1. Comment the iterative **public String toString()** method of the given **SLL<T>** class then implement it as a recursive method. Use appropriate helper method in your solution.
2. Use the given test program to test your recursive methods.

**Sample program run:**

The list is: [ Taif Dammam Abha Riyadh Jubail ]  
It is true that the list contains Dammam.  
It is false that the list contains Jeddah.

1. (a) Comment the iterative **public T dequeue()** method of the given class **QueueAsArray<T>** then implement

it as a recursive method. Use an appropriate helper method in your solution.

(b) Write a test program to test the recursive **dequeue** method.

**Sample program run:**

The queue is: 60 20 40 30 70   
 First dequeued element is: 60  
 Second dequeued element is: 20  
 After two node deletion the queue is: 40 30 70   
 Element at queue front is: 40