Lab Test

Name:	
Matric No.:	Section:

Answer **question 1** and any other **TWO (2)** questions.

1. Write a BST class that implements a binary search tree, Suppose the keys are inserted into a binary search tree in this order.

   55,63,31,17,22,40,24

   a. Draw the tree
   b. The class should include functions that perform the following tree traversal strategies:
      i. pre-order traversal
      ii. post-order traversal
      iii. in order traversal

2. Assume you are building a database using **linked lists** for the school football team. People are constantly being enrolled and dropped out of the team. Your job is to keep track of the players. The players can be identified by their assigned 3-digit number (eg. 759, 412). Build a system using the most appropriate data structure following the sample output.

Sample output:

```
Inserted!
Inserted!
Inserted!

Number of players: 3
No. : 596, 132, 328

Dropped!

Number of players: 2
No. : 132, 328
```

3. Write a class for a "Last in, First out" data structure using **arrays**. The structure should contain the following names: {"Ahmad", "Sarah", "Afifi", "Jamal", "Kamal", "Amina", "Nur", "Iqmal"}
    a. The class should include functions that performs the following
        i. Insertion of a new name where a new name is added to the data structure.
        ii. Removal of a name where a name is removed from the data structure.
        iii. Displays all the names present in the data structure.

4. Write a program that stores 5 integers in an array.
    a. Display the elements of the array and their respective addresses using pointers.

Your output should look like this:
Integer 1 : **x**
Integer 2 : **x**
Integer 3 : **x**
Integer 4 : **x**
Integer 5 : **x**
Elements in array are:
Element 1 contains the value **x** and is located at **y**
Element 2 contains the value **x** and is located at **y**
Element 3 contains the value **x** and is located at **y**
Element 4 contains the value **x** and is located at **y**

5. Write a binary tree class that implements a binary tree of **float** objects to record the following structure.

7.5 – 5.3, 8.2
5.3 – 2.9, 9.7
8.2 – 22.2, 9.5

   a. The class should include a function that performs a in order tree traversal