Algorithm and Data Structures – Lab Assignment

Array | Stack | Queue

1. Create an array of size 10 with the values 10,20,30,40.

   i) Traverse the array and display the elements
   ii) Read a number from user and insert it to the array so that the array still remains in sorted order.
2. Write a Java class named ArrayDemo with

   the following methods * data members

   * an empty array of size 10 as data member of the class

   Following methods
   i) A method that accept a value from user and store it to the array at the last position
   ii) A method to traverse the array and display all the elements

   Call the methods from main method.

3. Write a Java class named ArrayDemo with an array as data member and the following methods

   a. A method that takes a position and a value as parameter and insert the value at the position
   b. A method that takes a position as parameter and delete the element at the position
   c. A method that takes a value as parameter and delete the value from the array
   d. Traverse the array and display the elements

Create a class with the main method. Create an array inside the main method.Call the methods in ArrayDemo class from the main method

4.

Write a Java class StackDemo with methods for the following functionalities.

* Determine whether a stack is empty.
* Determine whether a stack is full.
* Push a new item to the stack. Before pushing method must check whetherqueue is full.

Remove (pop) from the stack the item that was added most recently and display it. Before removing method must check whether queue is empty

Use the above methods try the following from the main method

- Read n inputs from user and push to array
- Remove top k elements from the stack and display.
- Push few more elements to stack
- Remove all the items from the stack and display

5.

Write a Java class QueueDemo with methods for the following functionalities.

* Determine whether a Queue is empty.
* Determine whether a Queue is full.
* En-queue an item to the Queue . Before en-queuing check whether queue is full.
* De-queue an item from the queue . Before removing method must check whether queue is empty

Use the above methods try the following from the main method

- Read 5 inputs from user and do enqueue operation
- Remove 3 elements from the queue and display.
- En-queue few more elements
- De-Queue aII the items from the queue and display