

## CS 162 ASSIGNMENT 3

### 1) PATTERN

```
import java.util.Scanner;

public class pattern {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        int n=sc.nextInt();
        for(int i=0;i<n;i++)
        {
            for(int j=1;j<n-i;j++)
                System.out.print(" ");
            System.out.print("*");
            if(i==0)
            {
                System.out.println();
                continue;
            }
            for(int j=1;j<=(2*i-1);j++){
                System.out.print(" ");
            }
            System.out.print("*");
            System.out.println();
        }
        n--;
        for(int i=n-1;i>=0;i--)
        {
            for(int j=0;j<=n-i-1;j++)
                System.out.print(" ");
            System.out.print("*");
            //Spaces
            if(i==0)
                continue;
            for(int j=1;j<=2*i-1;j++)
                System.out.print(" ");
            System.out.print("*");
```

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```
        System.out.println();
    }
}
}
```

## OUTPUT

```

7
      *
     * *
    *   *
   *     *
  *       *
 *         *
*           *
*         *
 *       *
  *     *
   *   *
    * *
     *

```

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## 2) ARRAY LINEAR LIST

```
import java.util.*;
class ArrayLinearList{
    protected Object elements[];
    protected int size;
    public ArrayLinearList(int initialCapacity){
//Paratemetrized Constructor
        elements=new Object[initialCapacity];
        if(initialCapacity<1)
        {
            throw new IllegalArgumentException("Initial capacity
cannot be less than 1");
        }
        size=0;
    }
    public ArrayLinearList(){           //Non Parametrized constructor
        this(10);
    }
    public void extendArray(){           //Function to double array
elements[] length
        int temp=elements.length;
        temp=temp*2;
        Object arr[]=new Object[temp];
        for(int i=0;i<size;i++)
        {
            arr[i]=elements[i];
        }
        elements=arr;
    }
    public void show(){
        for(int i=0;i<size;i++)
        {
            System.out.print(elements[i]+" ");
        }
        System.out.println();
    }
}
```

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```
    public void add(Object obj,int index){           //Add an object
at a particular index
        if(index>=elements.length)
            throw new IndexOutOfBoundsException("Arraylist capacity is
"+elements.length) ;
        if(size==elements.length)
        {
            extendArray() ;
        }
        Object temp=obj;

        for(int i=index;i<=size;i++){

            Object temp1=elements[i];
            elements[i]=temp;
            temp=temp1;
        }
        size++;
    }
    public Object deleteIndex(int index){           //Delete an object
at particular index
        Object temp=elements[index];
        for(int i=index;i<size-1;i++){

            elements[i]=elements[i+1];
        }
        elements[size-1]=null;
        size--;
        return temp;
    }
    public void addRear(Object a){           //Add an object to rear
        if(size==elements.length)
        {
            extendArray() ;
        }
        elements[size++]=a;
    }
    public void addFront(Object a){           //Add an object to front
```

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```
        if(size==elements.length)
        {
            extendArray();
        }
        Object temp=a;

        for(int i=0;i<=size;i++){

            Object temp1=elements[i];
            elements[i]=temp;
            temp=temp1;
        }
        size++;
    }
    public Object deleteRear(){           //Delete an object from Rear
        Object temp=elements[size-1];
        elements[--size]=null;
        return temp;
    }
    public Object deleteFront(){          //Delete an object from
front
        Object temp=elements[0];
        for(int i=0;i<size-1;i++){

            elements[i]=elements[i+1];
        }
        elements[size-1]=null;
        size--;
        return temp;
    }
    public Object get(int index){         //access an element at that
index
        return elements[index];
    }
}
class practice
{
```

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```
public static void main (String[] args) throws
java.lang.Exception
{
    Scanner sc=new Scanner(System.in);
    ArrayLinearList li=new ArrayLinearList();
    li.addRear(3);
    li.addRear(4);
    li.addRear(5);
    li.addFront(1);
    li.add(2, 1);
    li.show();
    System.out.println("Deleting from rear "+li.deleteRear());
    System.out.println("Deleting from front "+li.deleteFront());
    System.out.println("Deleting from index 1 =
"+li.deleteIndex(1));
    li.show();
    System.out.println("Get Element at index 1 = "+li.get(1));
}
}
```

## OUTPUT

```
1 2 3 4 5
Deleting from rear 5
Deleting from front 1
Deleting from index 1 = 3
2 4
Get Element at index 1 = 4
```