1. A) Create a Java class called ***Student*** with the following details as variables within it.
(i) USN
(ii) Name
(iii) Branch
(iv) Phone
Write a Java program to create *nStudent* objects and print the USN, Name, Branch, and Phone of these objects with suitable headings.

B) Write a Java program to implement the Stack using arrays. Write Push(), Pop(), and Display() methods to demonstrate its working.

1A)
```
import java.util.Scanner; /* import the util package for Scanner class */
class Student   /*Student class with instance variables */
{
   String usn;
   String name;
   String branch;
   long phoneNo;

   /* constructor to initialize the instance variables */
   Student(String sname,String susn,String sbranch,long sphoneNo)
   {
     usn = susn;
     name = sname;
     branch = sbranch;
     phoneNo = sphoneNo;
   }
   /* Method to print the student data */
   void printStudentData()
   {
    System.out.println("Name of the Student :"+ name);
    System.out.println("USN of the Student :"+ usn);
    System.out.println("Branch of the Student :"+ branch);
    System.out.println("Phone No of the Student :"+ phoneNo);
   }
}

public class StudentDemo   /* class which contains main method */
{
   public static void main(String [] args)
   {
      int nStudent,ch;
      /* create new instance of Scanner class to read the input from console */
      Scanner in = new Scanner(System.in);

      System.out.println("Enter the no of student objects to be created");
```

```
        nStudent = in.nextInt();
        /* Declare array of student type */
        Student stud [] = new Student [nStudent];

        while(true)
        {
           System.out.println("1:Create Student Data");
           System.out.println("2:Print Student Data");
           System.out.println("3:Exit");
           ch = in.nextInt();

           switch(ch)
           {
              case 1 :
                       for(int i=0;i<nStudent;i++)
                       {
                           System.out.println("Read the Student" +" "+(i+1)+" Details");
                           in.nextLine();
                           System.out.println("Enter the name of the student");
                           String name = in.nextLine();
                           System.out.println("Enter the usn of the student");
                           String usn = in.nextLine();
                           System.out.println("Enter the branch of the student");
                           String branch = in.nextLine();
                           System.out.println("Enter the phoneNo of the student");
                           long phoneNo = in.nextLong();
                           /* create the object of student type */
                           stud[i] = new Student(name,usn,branch,phoneNo);
                       }
                      break;

              case 2 :
                       for(int i=0;i<nStudent;i++)
                       {
                         System.out.print("Details of Student"+" "+(i+1)+"  is \n");
                         stud[i].printStudentData();
                       }
                       break;

              case 3 : System.exit(0);
              default : System.out.println("Enter the valid choice");
           }
        }
     }
  }
```

1B)
```
import java.util.Scanner;
class Stack  /* Declaration class stack */
{
   int top;
   int s [] = new int [5]; /* Create an Stack using array */

   /* Constructor to initialize the variables */
    Stack()
   {
      top = -1;
   }

   /* Push method for stack */
   void push(int item)
   {
       if(s.length-1 == top)
       {
          System.out.println("Stack overflow");
          return;
       }
       else
       {
          top = top + 1;
          s[top] = item;
       }
    }
   /* Pop method for stack */
   void pop()
   {
      if(top == -1)
      {
         System.out.println("Stack underflow \n");
         return;
      }
      int item = s[top];
      System.out.println("Item deleted popped is :"+item);
      top = top-1;
   }
    void display()
   {
      if(top == -1)
      {
        System.out.println("Stack is empty.No items to display");
        return;
      }
      System.out.println("Items in the Stack are:");
```

```
            for(int i = top;i>=0;i--)
            {
              System.out.println(s[i]);
            }
        }
} /* End of class Stack */

public class StackDemo
{
    public static void main(String [] args)
    {
       int ch;
       Stack stk = new Stack(); /* creation of new Stack object */
       Scanner in = new Scanner(System.in);
       while(true)
       {
          System.out.println("Stack operations Demo");
          System.out.println("Enter 1: Push 2: Pop 3: Display 4:Exit");
          ch = in.nextInt();
          switch(ch)
          {
              case 1 :  System.out.println("Enter the item to be pushed into the stack");
                        int item = in.nextInt();
                        stk.push(item);
                        break;

              case 2 : stk.pop();
                       break;

              case 3 : stk.display();
                       break;

              case 4 : System.exit(0);

              default : System.out.println("Enter the valid choice");
           }
       }
   }
}
```