CSE1007 – Java Programming – ELA

Winter 2019-20

ASSESSMENT - 3

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TASK - 1

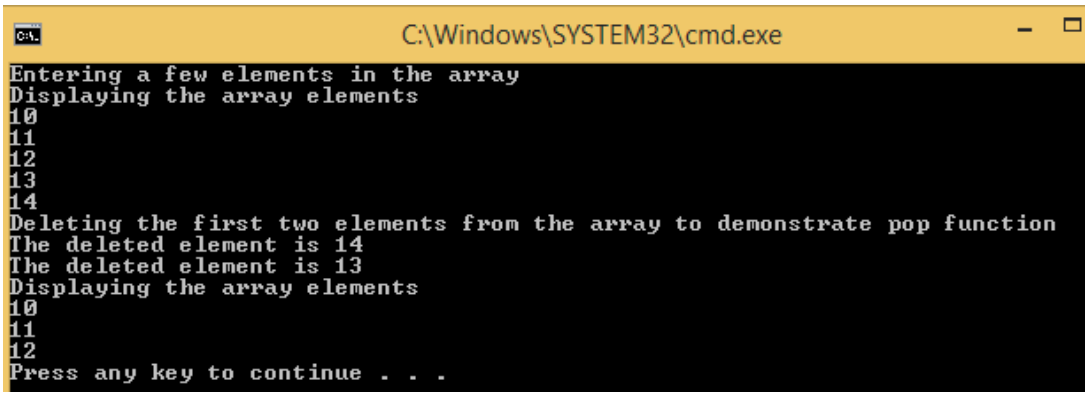
Design a java interface 'ArrayInterface' with appropriate methods to insert a data element into an array, delete a data element from the array and to display all elements in the array. Create a class 'ArrayClass' by implementing the ArrayInterface for an integer array of 'n' integers. Write a Java program to test them.

CODE

```
interface Stack
{
void push(int item);
int pop();
void display();
}
class FixedStack implements Stack
{
private int ar[];
private int k;
// allocate and initialize stack
FixedStack(int size)
{
ar = new int[size];
k = -1;
}
public void push(int item)
{
if(k==ar.length-1) // use length member
System.out.println("Stack is full.");
else
ar[++k] = item;
}
// Pop an item from the stack
public int pop()
{
if(k < 0) {
System.out.println("Stack underflow.");
return 0; }
else
{
        int var = ar[k];
        k--;
return var;
}
}

public void display()
```

```
{
for(int i=0;i<=k;i++)
{
        System.out.println(ar[i]);
}
}
}

class IF
{
public static void main(String args[]) {
FixedStack array = new FixedStack(5);

System.out.println("Entering a few elements in the array");
for(int i=10; i<15; i++)
array.push(i);

System.out.println("Displaying the array elements");
array.display();

System.out.println("Deleting the first two elements from the array to demonstrate pop function");
for(int i=0; i<2; i++)
System.out.println("The deleted element is " +array.pop());

System.out.println("Displaying the array elements");
array.display();
} }
```

OUTPUT



TASK - 2

Develop an interface 'Shape' with suitable methods to set the number of sides of the shape and calculate the area of the shape. Create a class 'Square' using Shape and add circumference calculation to the Square class. Then inherit a new class 'Cube' from Square by adding the volume calculations. Write a Java program to test them.

CODE

```
import java.io.*;
import java.util.*;
interface shape
{
void num_sides();
void calc_area(int x);

}
class square implements shape
{
        int n;
public void num_sides()
{
n = 4;
System.out.println("The number of sides of a square is : " + n);
}
public void calc_area(int x)
{
double area;
area = x*x;
System.out.println("The area of the square is : " + area);
}
void calc_circum(int n)
{
double circum = 4*n;
System.out.println("The circumference of the square is : " + circum);
}

}
class cube extends square
{
        int n;
void calc_vol(int x)
{
double vol;
vol=x*x*x;
System.out.println("The volume of the cube is : " + vol);
}
public void num_sides()
{
n = 6;
System.out.println("The number of sides of a cube is : " + n);
}
public void calc_area(int x)
{
double area;
area = 6*x*x;
System.out.println("The area of the cube is : " + area);
}
}
```

```
class Main
{
public static void main(String[] args)
{
square sq = new square();
Scanner sc = new Scanner(System.in);
int ss,scu;
System.out.println("Enter length of side of square and cube");
ss = sc.nextInt();
scu = sc.nextInt();
sq.num_sides();
sq.calc_circum(ss);
sq.calc_area(ss);
cube cb = new cube();
cb.num_sides();
cb.calc_area(scu);
cb.calc_vol(scu);
}
}
```

OUTPUT