OOPL

Week 7

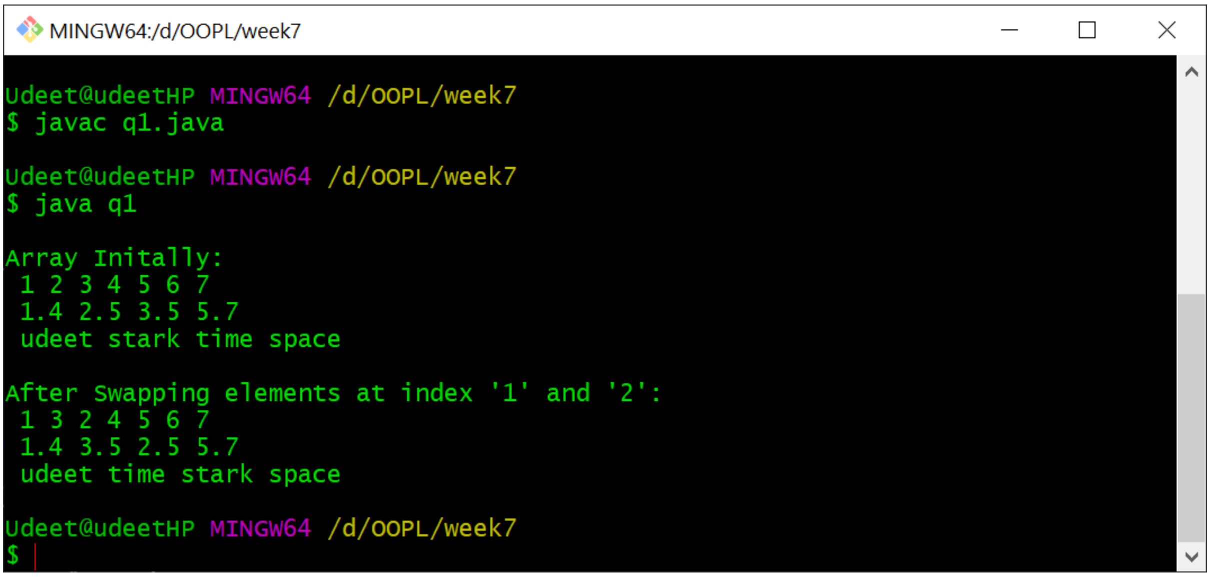
Udeet Mittal

CSE C3

Roll Number 64

1.

```
import java.util.*;
class Array<Type> {
 public static <Type> void swap(Type[] arr, int a, int b) {
 Type temp = arr[a];
 arr[a] = arr[b];
 arr[b] = temp;
 }
 public static <Type> void display(Type[] arr) {
 for (Type obj : arr) {
 System.out.print(" " + obj);
 }
 System.out.println();
 }
}

public class q1 {
 public static void main(String[] args) {
 Integer intArray[] = { 1, 2, 3, 4, 5, 6, 7};
 Double doubleArray[] = { 1.4, 2.5, 3.5, 5.7};
 String stringArray[] = { "udeet", "stark", "time", "space" };
 System.out.println("\nArray Initally:");
 Array.display(intArray);
 Array.display(doubleArray);
 Array.display(stringArray);
 System.out.println("\nAfter Swapping elements at index '1' and '2':");
 Array.swap(intArray, 1, 2);
 Array.swap(doubleArray, 1, 2);
 Array.swap(stringArray, 1, 2);
 Array.display(intArray);
 Array.display(doubleArray);
 Array.display(stringArray);
 }
}
```



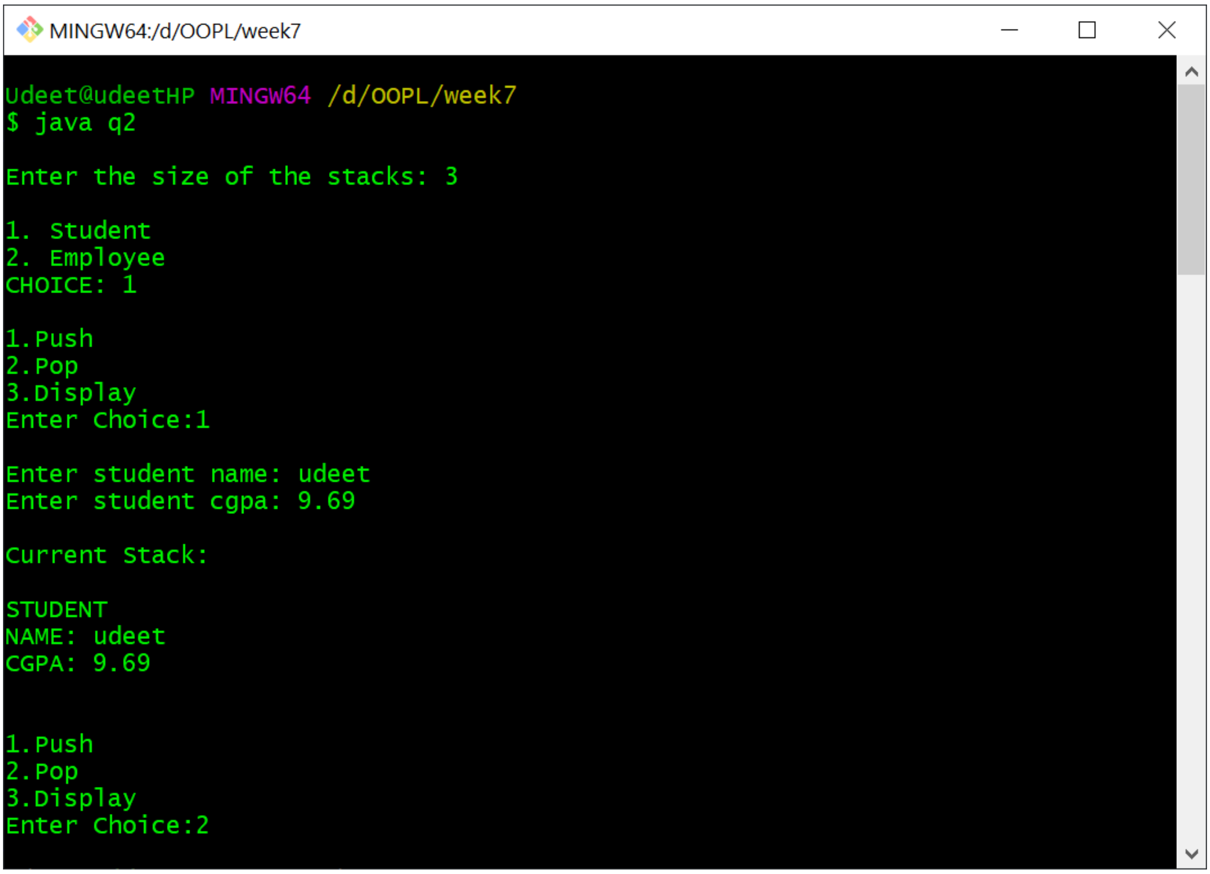
```
Udeet@udeetHP MINGW64 /d/OOPL/week7
$ javac q1.java

Udeet@udeetHP MINGW64 /d/OOPL/week7
$ java q1

Array Initally:
 1 2 3 4 5 6 7
 1.4 2.5 3.5 5.7
 udeet stark time space

After Swapping elements at index '1' and '2':
 1 3 2 4 5 6 7
 1.4 3.5 2.5 5.7
 udeet time stark space

Udeet@udeetHP MINGW64 /d/OOPL/week7
$
```

2.

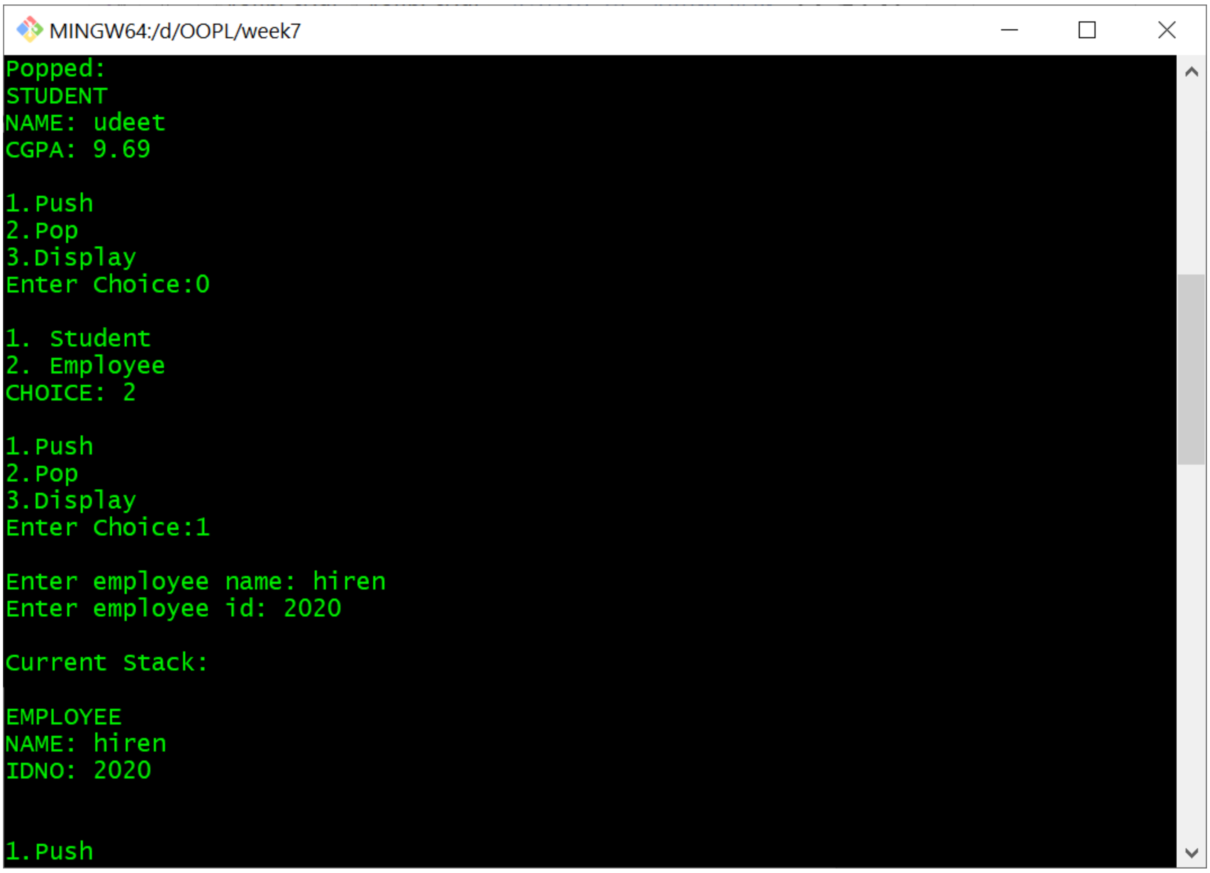
```
import java.lang.reflect.*;
import java.util.*;
class Stack<Type> {
 private Type[] arr;
 private int tos;
 public Stack(int n) {
 tos = -1;
 arr = (Type [])new Object[n];
 }
 public boolean isEmpty() {
 return (tos == -1);
 }
 public void push(Type item) {
 if (tos == arr.length - 1) {
 System.out.println("\nSTACK OVERFLOW!");
 return;
 }
 arr[++tos] = item;
 }
 public Type pop() {
 if (tos == -1) {
 System.out.println("\nSTACK UNDERFLOW!");
 return null;
 }
 return arr[tos--];
 }
 public String toString() {
 if (tos == -1) {
 return "STACK IS EMPTY!";
 }
 String str = "";
 for (int i = 0; i <= tos; ++i) {
 str += " " + arr[i];
 }
 return str;
 }
}
class Student {
 private String name;
 private double cgpa;
 public void input() {
 Scanner sc = new Scanner(System.in);
 System.out.print("\nEnter student name: ");
 name = sc.nextLine();
 System.out.print("Enter student cgpa: ");
 cgpa = sc.nextDouble();
 }
 public String toString() {
 return "\nSTUDENT\nNAME: " + name + "\nCGPA: " + cgpa + "\n";
 }
}
class Employee {
 private String name;
 private String idno;
 public void input() {
 Scanner sc = new Scanner(System.in);
 System.out.print("\nEnter employee name: ");
 name = sc.nextLine();
 System.out.print("Enter employee id: ");
 idno = sc.nextLine();
 }
 public String toString() {
 return "\nEMPLOYEE\nNAME: " + name + "\nIDNO: " + idno + "\n";
 }
}
public class q2 {
 public static void main(String[] args) {
 Scanner sc = new Scanner(System.in);
 System.out.print("\nEnter the size of the stacks: ");
 int n = sc.nextInt();
 Stack<Student> sstack = new Stack<Student>(n);
 Stack<Employee> estack = new Stack<Employee>(n);
 int typeChoice;
 do {
 System.out.print("\n1. Student\n2. Employee\nCHOICE: ");
 typeChoice = sc.nextInt();
 if (typeChoice != 1 && typeChoice != 2) {
 System.out.println("Invalid Choice!");
 System.exit(0);
 }
 int operationChoice;
 do {
 System.out.print("\n1.Push\n2.Pop\n3.Display\nEnter Choice:");
 operationChoice = sc.nextInt();
 if (operationChoice < 1 || operationChoice > 3) {
 break;
 }
 if (operationChoice == 1) {
```

```
if (typeChoice == 1) {
Student stud = new Student();
stud.input();
sstack.push(stud);
}
else {
Employee empl = new Employee();
empl.input();
estack.push(empl);
}
}
else if (operationChoice == 2) {
if (typeChoice == 1) {
Student stud = sstack.pop();
if (stud != null) {
System.out.print("\nPopped: " + stud);
}
}
else {
Employee empl = estack.pop();
if (empl != null) {
System.out.print("\nPopped: " + empl);
}
}
}
if (typeChoice == 1) {
if (!sstack.isEmpty()) {
System.out.println("\nCurrent Stack: \n" + sstack);
}
```

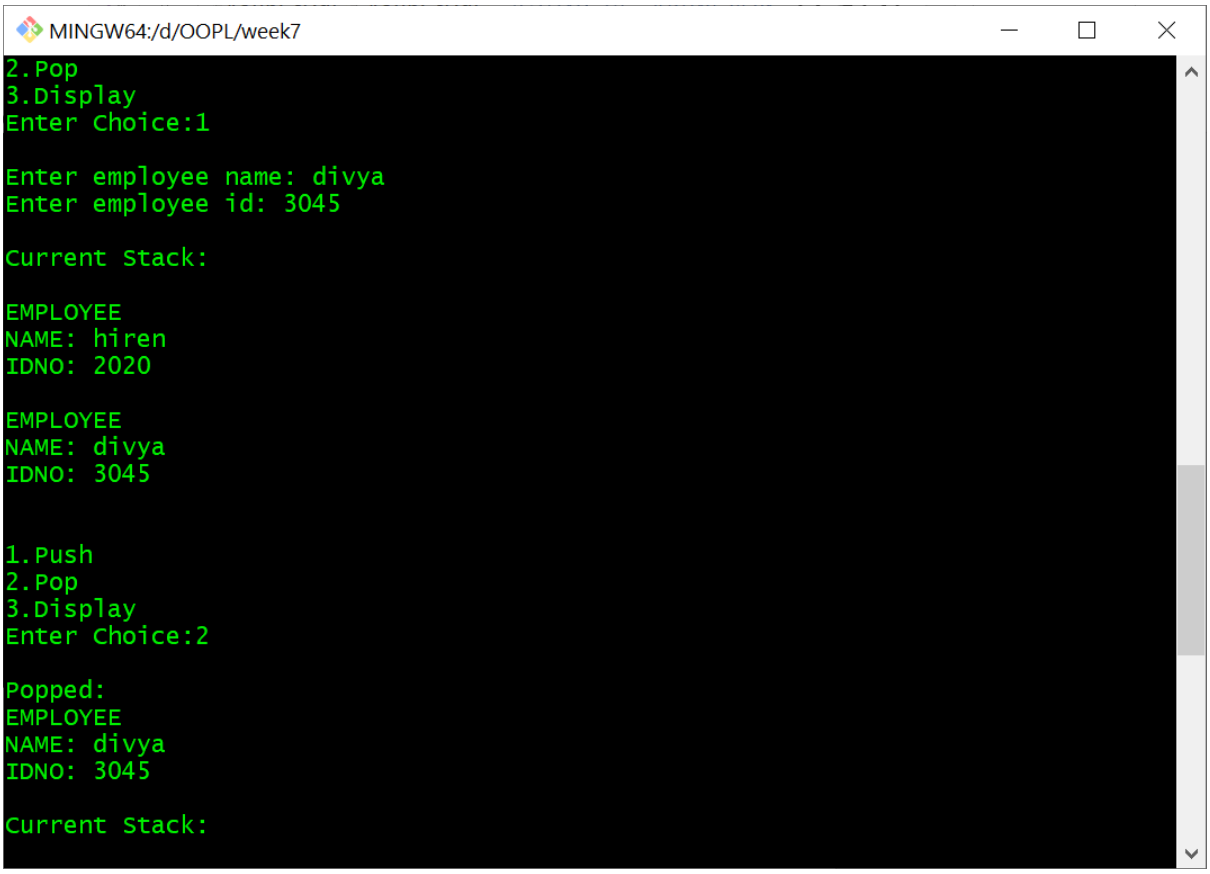
```
}
else {
if (!estack.isEmpty()) {
System.out.println("\nCurrent Stack: \n" + estack);
}
}
} while (operationChoice >= 1 && operationChoice <= 3);
} while (typeChoice == 1 || typeChoice == 2);
}
}
```



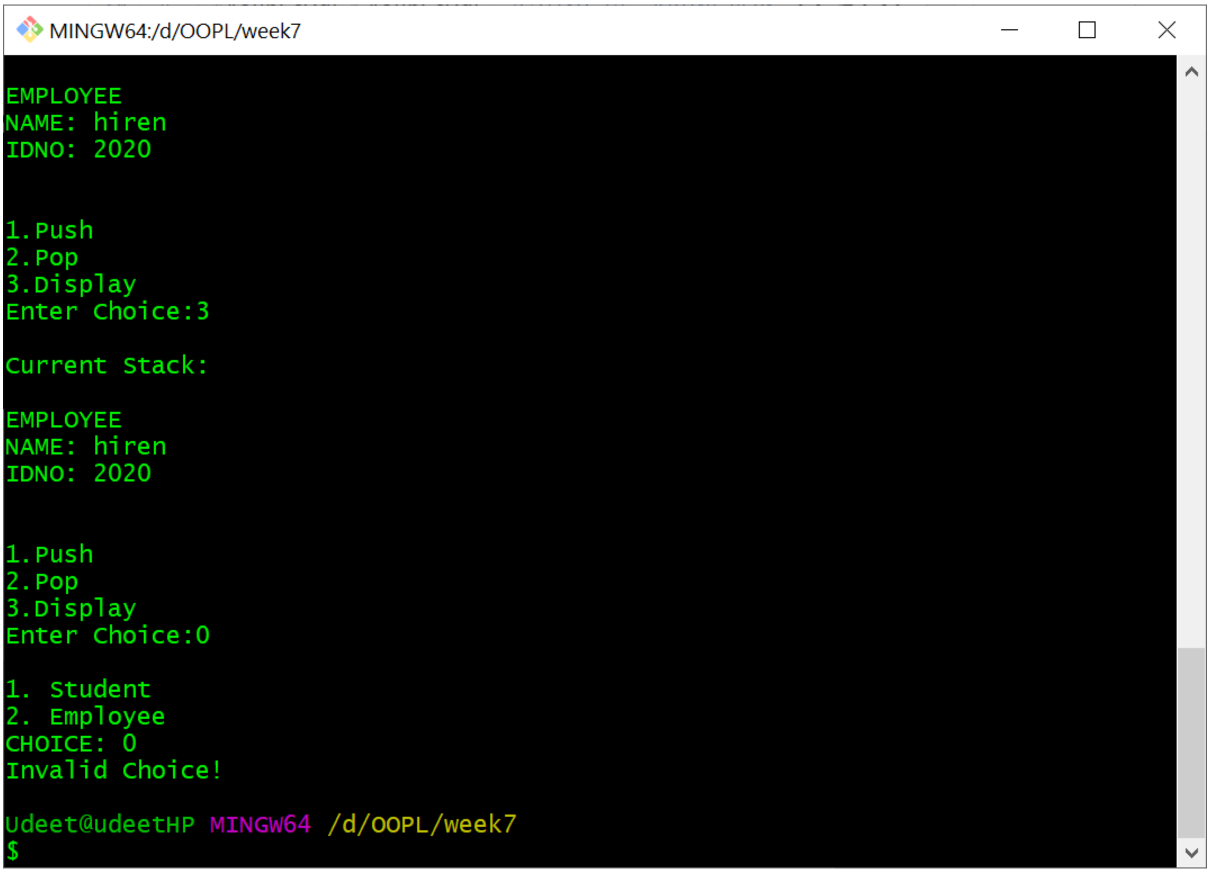
```
Udeet@udeetHP MINGW64 /d/OOPL/week7
$ java q2

Enter the size of the stacks: 3

1. Student
2. Employee
CHOICE: 1

1.Push
2.Pop
3.Display
Enter Choice:1

Enter student name: udeet
Enter student cgpa: 9.69

Current Stack:

STUDENT
NAME: udeet
CGPA: 9.69


1.Push
2.Pop
3.Display
Enter Choice:2
```



```
Popped:
STUDENT
NAME: udeet
CGPA: 9.69

1.Push
2.Pop
3.Display
Enter Choice:0

1. Student
2. Employee
CHOICE: 2

1.Push
2.Pop
3.Display
Enter Choice:1

Enter employee name: hiren
Enter employee id: 2020

Current Stack:

EMPLOYEE
NAME: hiren
IDNO: 2020


1.Push
```



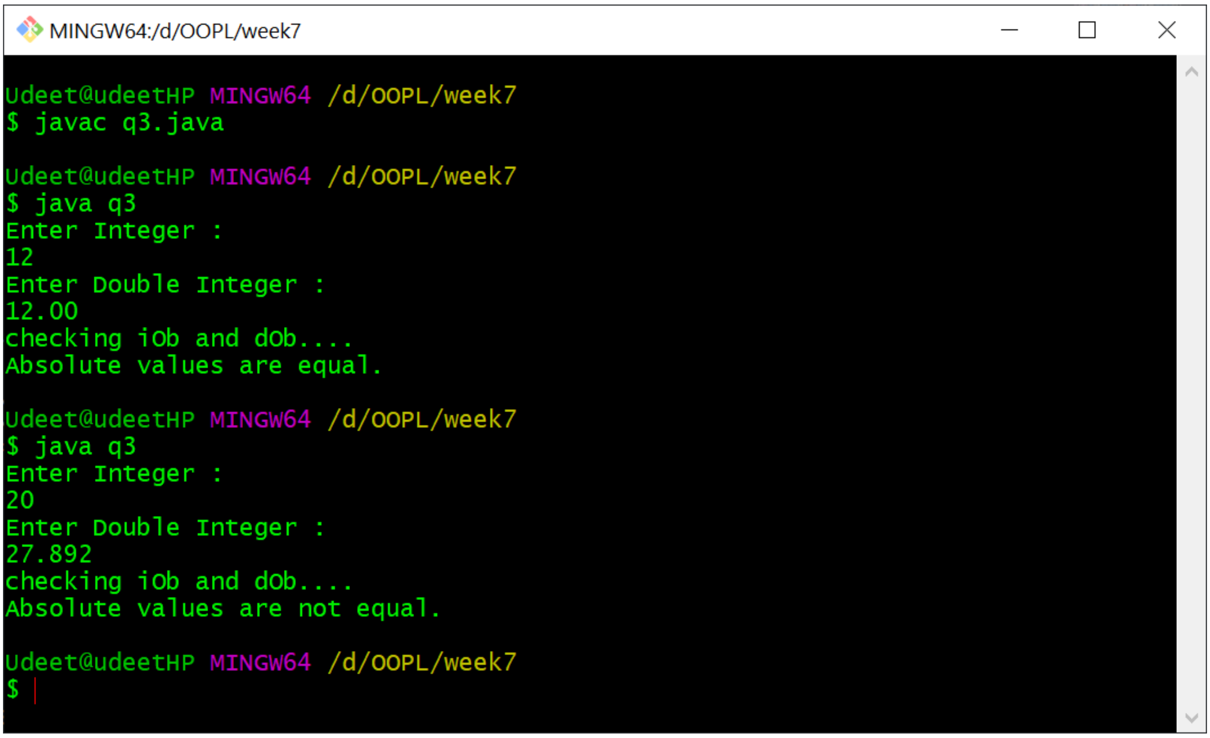
```
2.Pop
3.Display
Enter Choice:1

Enter employee name: divya
Enter employee id: 3045

Current Stack:

EMPLOYEE
NAME: hiren
IDNO: 2020

EMPLOYEE
NAME: divya
IDNO: 3045


1.Push
2.Pop
3.Display
Enter Choice:2

Popped:
EMPLOYEE
NAME: divya
IDNO: 3045

Current Stack:
```



```
EMPLOYEE
NAME: hiren
IDNO: 2020


1.Push
2.Pop
3.Display
Enter Choice:3

Current Stack:

EMPLOYEE
NAME: hiren
IDNO: 2020


1.Push
2.Pop
3.Display
Enter Choice:0

1. Student
2. Employee
CHOICE: 0
Invalid Choice!

Udeet@udeetHP MINGW64 /d/OOPL/week7
$
```

3.

```
import java.util.*;
import java.io.*;
class NumericFns<T extends Number> {
 T num;
 NumericFns(T n) {
 num = n;
 }
 double reciprocal() {
 return 1 / num.doubleValue();
 }
 double fraction() {
 return (num.doubleValue() - num.intValue());
 }
 boolean absEqual(NumericFns<?> ob) {
 if (Math.abs(num.doubleValue()) == Math.abs(ob.num.doubleValue())) {
 return true;
 }
 return false;
 }
}

class q3{
 public static void main(String[] args) {
 Scanner sc = new Scanner(System.in);
 System.out.println("Enter Integer : ");
 int i = sc.nextInt();
 System.out.println("Enter Double Integer : ");
 double d = sc.nextDouble();
 NumericFns<Integer> iOb = new NumericFns<Integer>(i);
 NumericFns<Double> dOb = new NumericFns<Double>(d);
 System.out.println("checking iOb and dOb....");
 if (iOb.absEqual(dOb)) {
 System.out.println("Absolute values are equal.");
 }
 else {
 System.out.println("Absolute values are not equal.");
 }
 }
}
```



```
Udeet@udeetHP MINGW64 /d/OOPL/week7
$ javac q3.java

Udeet@udeetHP MINGW64 /d/OOPL/week7
$ java q3
Enter Integer :
12
Enter Double Integer :
12.00
checking iOb and dOb....
Absolute values are equal.

Udeet@udeetHP MINGW64 /d/OOPL/week7
$ java q3
Enter Integer :
20
Enter Double Integer :
27.892
checking iOb and dOb....
Absolute values are not equal.

Udeet@udeetHP MINGW64 /d/OOPL/week7
$
```