**JAVA ASSIGNMENT**

**SEPT 5, 2020**

**1. A Bank issues tokens to its customers that have 4 one-digit numbers 0 to 9 on it.The customers are called to the counter in any one of the following two choices:**

**a) A customer is attended if they have a token that has the digits in any order.**

**b) A customer is attended if they have a token that has the digits in required order.**

**Write a java program that displays the chances of customers being attended. Also, the program should track the number of customers attended. Few customers may have received the token but there is a possibility they leave the bank without going to the counter. Such customer’s token details should be removed.**

**Program the above scenario by incorporating the following concepts in your own way**

**Ø Classes & objects**

**Ø Constructors**

**Ø Garbage invocation request**

**Ø Static keyword**

**Ø Object array**

**SOURCE CODE:**

import java.util.\*;

import java.util.concurrent.ThreadLocalRandom;

class customers{

    String name;

    int token,wait=0;

    static int len=0;

    static int overflow=80;

    int[] count;

    float probability\_crct,probability\_any;

    customers(){

        Scanner sc= new Scanner(System.in);

        System.out.println("\nEnter the Customer Name: ");

        this.name=sc.next();

        System.out.println("Enter the Token number: ");

        this.token=sc.nextInt();

        this.count=new int[10];

        for(int i=0;i<10;i++) this.count[i]=0;

        int temp=this.token;

        while(temp>0)

        {

            this.count[temp%10]++;

            temp/=10;

        }

        this.probability\_crct=(float)1/10000;

        this.wait=0;

        len++;

    }

    customers(int temp){

        this.token=temp;

        this.count=new int[10];

        for(int i=0;i<10;i++) this.count[i]=0;

        while(temp>0)

        {

            this.count[temp%10]++;

            temp/=10;

        }

        this.probability\_crct=(float)1/10000;

        this.wait=0;

        len++;

    }

    void get\_anyprob(){

        this.probability\_any=24;

        for(int i=0;i<10;i++)

        {

            if(count[i]==0) continue;

            for(int j=1;j<=count[i];j++) this.probability\_any/=j;

        }

        this.probability\_any/=10000;

    }

    boolean match(int temp){

        int[] t=new int[10];

        for(int i=0;i<10;i++) t[i]=0;

        while(temp>0)

        {

            t[temp%10]++;

            temp/=10;

        }

        for(int i=0;i<10;i++){

            if(t[i]!=this.count[i]) return false;

        }

        return true;

    }

    boolean due(){

        this.wait++;

        if(this.wait>=customers.overflow){

            return true;

        }

        return false;

    }

}

public class bank{

    public static void main(String args[]){

        Scanner sc= new Scanner(System.in);

        int n,i,j;

        String name;

        System.out.println("Enter the number of the customers in the queue: ");

        n=sc.nextInt();

        customers[] arr=new customers[n];

        for(i=0;i<n;i++)

            arr[i]=new customers();

        for(i=0;i<n;i++)

        {

            arr[i].get\_anyprob();

            System.out.println("\nCustomer Name: " + arr[i].name + "\nCustomer Token: " + arr[i].token);

            System.out.println("Required Order Prob: " + arr[i].probability\_crct + "\nAny order Prob: " + arr[i].probability\_any);

        }

        System.out.print("\n");

        int trial=0;

        while(customers.len>0){

            j=ThreadLocalRandom.current().nextInt();

            if(j<0) j\*=-1;

            j%=10000;

            trial++;

            for(i=0;i<n;i++){

                if(arr[i]!=null && arr[i].match(j)){

                    System.out.println("Customer Name: " + arr[i].name + ",Customer Token: " + arr[i].token + " has been called! ");

                    arr[i]=null;

                    System.gc();

                    customers.len--;

                    break;

                }

            }

            for(i=0;i<n;i++){

                    if(arr[i]!=null && arr[i].due()){

                    System.out.println("Customer Name: " + arr[i].name + ",Customer Token: " + arr[i].token + " has left! ");

                    arr[i]=null;

                    System.gc();

                    customers.len--;

                }

            }

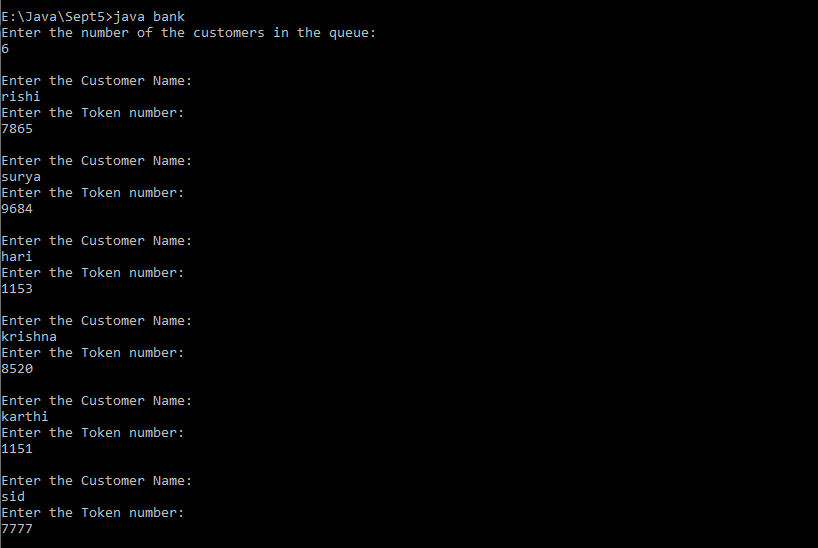
        }

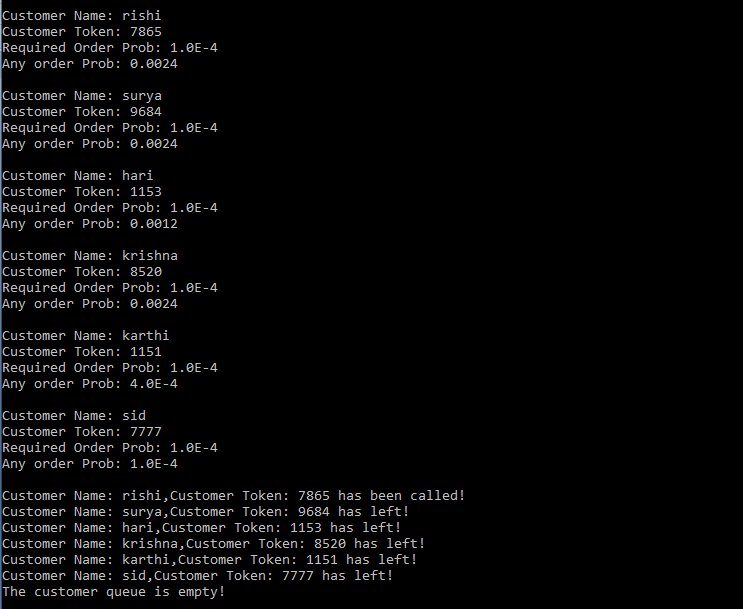
        System.out.println("The customer queue is empty!");

    }

}

**OUTPUT:**

****

****

**BY**

**M DINESH PRABHU**

**2018503518**