

CSE1007 - PROGRAMMING **IN JAVA**

Final Assessment Test **(FAT) - Lab**

Question-4

Dribblefire Jets Inc. make two types of aeroplane, the two-engined DFII, and the four-engined DFIV. The engines are terrible and fail with probability 0.5 on a standard flight (the engines fail independently of each other). The manufacturers claim that the planes can fly if at least half of their engines are working, i.e. the DFII will crash only if both its engines fail, while the DFIV will crash if all four, or if any three engines fail.

You have been commissioned by the Civil Aviation Board to ascertain which of the two models is less likely to crash. Since parachutes are expensive, the cheapest (and safest!) way to do this is to simulate a large number of flights of each model. For example, two calls of `Math.random` could represent one standard DFII flight: if both random numbers are less than 0.5, that flight crashes, otherwise it doesn't. Write a program which simulates a large number of flights of both models, and estimates the probability of a crash in each case.

CODE:

```
import java.util.*;

public class q1{

    public static void test1()
    {
        Double max = 1.0;
        double a = (Math.random() * (max));
        double n1 = Math.round(a * 10.0) / 10.0;
        double b = (Math.random() * (max));
        double n2 = Math.round(b * 10.0) / 10.0;
        if(n1<=0.5 && n2<=0.5)
            System.out.println("Crash");
        else
            System.out.println("No Crash");
    }

    public static void test2()
    {
        Double max = 1.0;
        int count =0;
        double a = (Math.random() * (max));
        double n1 = Math.round(a * 10.0) / 10.0;
```

```
if(n1<=0.5)
count++;
double b = (Math.random() * (max));
double n2 = Math.round(b * 10.0) / 10.0;
if(n2<=0.5)
count++;
double c = (Math.random() * (max));
double n3 = Math.round(c * 10.0) / 10.0;
if(n3<=0.5)
count++;
double d = (Math.random() * (max));
double n4 = Math.round(d * 10.0) / 10.0;
if(n4<=0.5)
count++;
if(count==3 || count==4)
System.out.println("Crash");
else
System.out.println("No Crash");
}

public static void main(String[] args)
{
Scanner in = new Scanner(System.in);
int i;

System.out.print("Enter no: of flight tests for DFII: ");
int n=in.nextInt();

for(i=0;i<n;i++)
{
System.out.print("Flight-"+(i+1)+" ": );
test1();
}

System.out.print("\nEnter no: of flight tests for DFIV: ");
int m=in.nextInt();

for(i=0;i<n;i++)
{
System.out.print("Flight-"+(i+1)+" ": );
test2();
}
}
}
```

OUTPUT:

```
exam1@AB1210SCOPE70:~/Desktop/test$ javac ql.java
exam1@AB1210SCOPE70:~/Desktop/test$ java ql
Enter no: of flight tests for DFII: 10
Flight-1: Crash
Flight-2: No Crash
Flight-3: Crash
Flight-4: Crash
Flight-5: No Crash
Flight-6: No Crash
Flight-7: No Crash
Flight-8: Crash
Flight-9: No Crash
Flight-10: No Crash

Enter no: of flight tests for DFIV: 10
Flight-1: Crash
Flight-2: No Crash
Flight-3: Crash
Flight-4: Crash
Flight-5: Crash
Flight-6: Crash
Flight-7: No Crash
Flight-8: No Crash
Flight-9: No Crash
Flight-10: No Crash
```

Part-B

Write a Software Phone App using JavaFX as shown in the figure. The user enters the phone number and clicks the "CALL" button to start a phone call. Once the call is started, the label of the "CALL" button changes to "HANG UP". When the user hangs up, the display is cleared and label is changed back to "CALL".



CODE:

```
import javafx.application.Application;
```

```
import javafx.scene.Group;  
import javafx.scene.Scene;  
import javafx.stage.Stage;  
import javafx.scene.text.*;  
import javafx.scene.layout.*;  
import javafx.scene.control.*;  
import javafx.geometry.Insets;  
import javafx.geometry.Pos;
```

```
public class q2 extends Application {  
    @Override  
    public void start(Stage stage) {  
        GridPane root = new GridPane();  
        TextField tf1 = new TextField();  
        root.add(tf1,0,0);  
        Button b1 = new Button("1");  
        root.add(b1,0,1);  
        Button b2 = new Button("2");  
        root.add(b2,1,1);  
        Button b3 = new Button("3");  
        root.add(b3,2,1);  
  
        Button b4 = new Button("4");  
        root.add(b4,0,2);  
        Button b5 = new Button("5");  
        root.add(b5,1,2);  
        Button b6 = new Button("6");
```

```
root.add(b6,2,2);

Button b7 = new Button("7");
root.add(b7,0,3);
Button b8 = new Button("8");
root.add(b8,1,3);
Button b9 = new Button("9");
root.add(b9,2,3);

Button b0 = new Button("0");
root.add(b0,1,4);
Button clear = new Button("CLEAR");
root.add(clear,0,4);
Button call = new Button("CALL");
root.add(call,2,4);

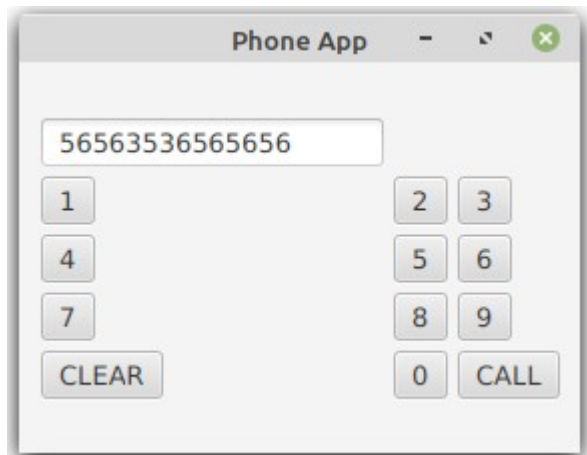
root.setMinSize(500, 500);
root.setPadding(new Insets(10, 10, 10, 10));
root.setVgap(5);
root.setHgap(5);
root.setAlignment(Pos.CENTER);

Scene scene = new Scene(root,400,400);
stage.setTitle("Phone App");
stage.setScene(scene);
stage.show();

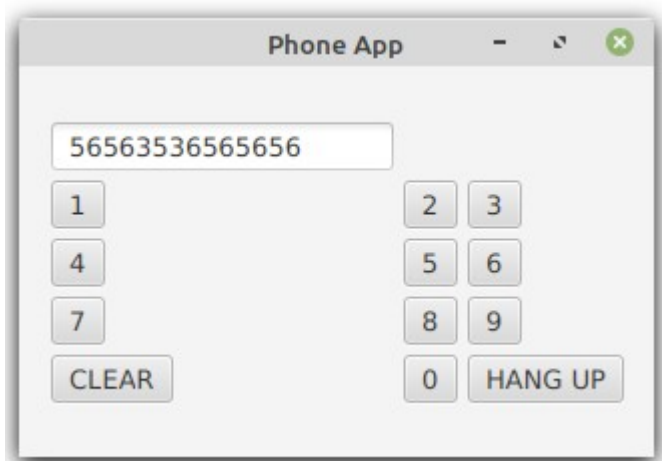
call.setOnAction((event) -> {
    if(call.getText().toString().equals("CALL"))
        call.setText("HANG UP");
    else
        call.setText("CALL");
});
}
public static void main(String args[]){
    launch(args);
}
}
```

OUTPUT:

(i)On typing number:



(ii)On pressing CALL:



(iii)On pressing HANG UP:

