

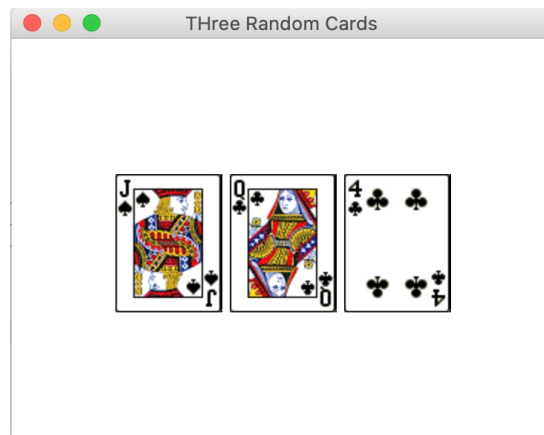
FX Problems

1. Create class `TicTacToe`. Clean build and run.

```
2  import ...7 lines |
9  public class TicTacToe extends Application
10 {
11     @Override // Override the start method in the Application class
12     public void start(Stage primaryStage)
13     {
14         Image imageX = new Image("image/x.gif");
15         Image imageO = new Image("image/o.gif");
16
17         GridPane pane = new GridPane();
18         pane.setAlignment(Pos.CENTER);
19         pane.setHgap(5);
20         pane.setVgap(5);
21
22         for (int i = 0; i < 3; i++)
23         {
24             for (int j = 0; j < 3; j++)
25             {
26                 int status = (int) (Math.random() * 3);
27                 if (status == 0)
28                 {
29                     pane.add(new ImageView(imageX), j, i);
30                 }
31                 else if (status == 1)
32                 {
33                     pane.add(new ImageView(imageO), j, i);
34                 }
35             }
36         }
37
38         // Create a scene and place it in the stage
39         Scene scene = new Scene(pane);
40         primaryStage.setTitle("Tic Tac Toe"); // Set the stage title
41         primaryStage.setScene(scene); // Place the scene in the stage
42         primaryStage.show(); // Display the stage
43     }
44
45     public static void main(String[] args)
46     {
47         launch(args);
48     }
49 }
```



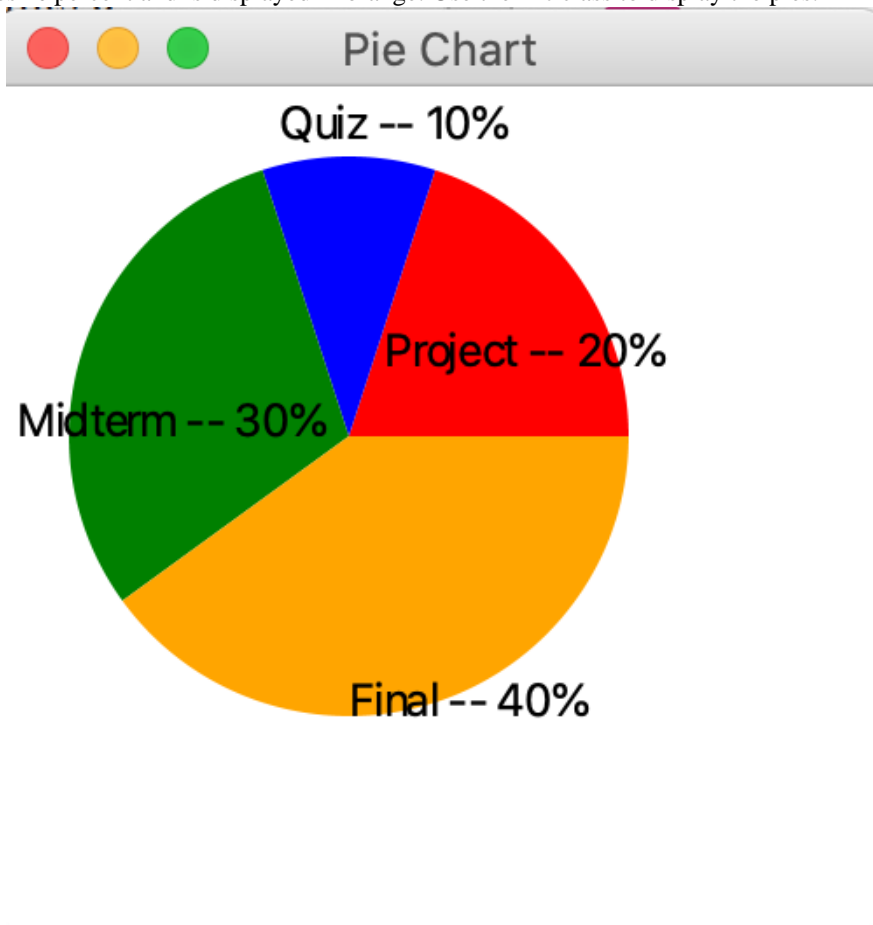
2. Create class `ThreeRandomCards` that displays three cards randomly selected from a deck of 52, as shown. Add a button to randomly display 3 cards out of 52 upon clicking it.



3. Create class BarChart. Clean build and run.

```
16 public class BarChart extends Application
17 {
18
19     @Override // Override the start method in the Application class
20     public void start(Stage primaryStage)
21     {
22         Pane pane = new Pane();
23
24         double height = 300;
25         double paneHeight = 150;
26         Rectangle r1 = new Rectangle(10, paneHeight - height * 0.2, 100, height * 0.2);
27         r1.setFill(Color.RED);
28         Text text1 = new Text(10, paneHeight - height * 0.2 - 10, "Project -- 20%");
29
30         Rectangle r2 = new Rectangle(10 + 110, paneHeight - height * 0.1, 100, height * 0.1);
31         r2.setFill(Color.BLUE);
32         Text text2 = new Text(10 + 110, paneHeight - height * 0.1 - 10, "Quiz -- 10%");
33
34         Rectangle r3 = new Rectangle(10 + 220, paneHeight - height * 0.3, 100, height * 0.3);
35         r3.setFill(Color.GREEN);
36         Text text3 = new Text(10 + 220, paneHeight - height * 0.3 - 10, "Midterm -- 30%");
37
38         Rectangle r4 = new Rectangle(10 + 330, paneHeight - height * 0.4, 100, height * 0.4);
39         r4.setFill(Color.ORANGE);
40         Text text4 = new Text(10 + 330, paneHeight - height * 0.4 - 10, "Final -- 40%");
41
42         pane.getChildren().addAll(r1, text1, r2, text2, r3, text3, r4, text4);
43
44         // Create a scene and place it in the stage
45         Scene scene = new Scene(pane, 500, paneHeight);
46         primaryStage.setTitle("Bar Chart"); // Set the stage title
47         primaryStage.setScene(scene); // Place the scene in the stage
48         primaryStage.show(); // Display the stage
49     }
50
51     public static void main(String[] args)
52     {
53         launch(args);
54     }
55 }
```

4. Write class PieChart pie chart to display the percentages of the overall grade represented by projects, quizzes, midterm exams, and the final exam. Suppose that projects take 20 percent and are displayed in red, quizzes take 10 percent and are displayed in blue, midterm exams take 30 percent and are displayed in green, and the final exam takes 40 percent and is displayed in orange. Use the Arc class to display the pies.

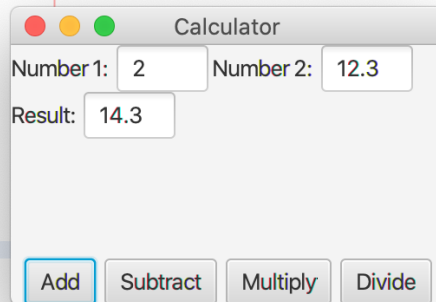


5. Create class `Calculator` to perform addition, subtraction, multiplication, and division.

```

18 public class Calculator extends Application
19 {
20     @Override
21     public void start(Stage primaryStage)
22     {
23         FlowPane pane = new FlowPane();
24         pane.setHgap(2);
25         TextField tfNumber1 = new TextField();
26         TextField tfNumber2 = new TextField();
27         TextField tfResult = new TextField();
28         tfNumber1.setPrefColumnCount(3);
29         tfNumber2.setPrefColumnCount(3);
30         tfResult.setPrefColumnCount(3);
31
32         pane.getChildren().addAll(new Label("Number 1: "), tfNumber1,
33             new Label("Number 2: "), tfNumber2, new Label("Result: "), tfResult);
34
35         HBox hBox = new HBox(5);
36         Button btAdd = new Button("Add");
37         Button btSubtract = new Button("Subtract");
38         Button btMultiply = new Button("Multiply");
39         Button btDivide = new Button("Divide");
40         hBox.setAlignment(Pos.CENTER);
41         hBox.getChildren().addAll(btAdd, btSubtract, btMultiply, btDivide);
42
43         BorderPane borderPane = new BorderPane();
44         borderPane.setCenter(pane);
45         borderPane.setBottom(hBox);
46         borderPane.setAlignment(hBox, Pos.TOP_CENTER);
47
48         // Create a scene and place it in the stage
49         Scene scene = new Scene(borderPane, 250, 150);
50         primaryStage.setTitle("Calculator"); // Set the stage title
51         primaryStage.setScene(scene); // Place the scene in the stage
52         primaryStage.show(); // Display the stage
53
54         btAdd.setOnAction(e ->{
55             tfResult.setText(Double.parseDouble(tfNumber1.getText())
56                 + Double.parseDouble(tfNumber2.getText()) + "");
57         });
58
59         btSubtract.setOnAction(e ->{
60             tfResult.setText(Double.parseDouble(tfNumber1.getText())
61                 - Double.parseDouble(tfNumber2.getText()) + "");
62         });
63
64         btMultiply.setOnAction(e ->{
65             tfResult.setText(Double.parseDouble(tfNumber1.getText())
66                 * Double.parseDouble(tfNumber2.getText()) + "");
67         });
68
69         btDivide.setOnAction(e ->{
70             tfResult.setText(Double.parseDouble(tfNumber1.getText())
71                 / Double.parseDouble(tfNumber2.getText()) + "");
72         });
73     }
74
75     public static void main(String[] args)
76     {
77         launch(args);
78     }
79 }

```



6. Create class `Investment` that calculates the future value of an investment at a given interest rate for a specified number of years. The formula for the calculation is:

$$\text{futureValue} = \text{investmentAmount} * (1 + \text{monthlyInterestRate})^{\text{years} * 12}$$

