JavaFX Calculator

```java
import javafx.application.*;
import javafx.scene.*;
import javafx.stage.*;
import javafx.scene.layout.*;
import javafx.scene.control.*;
import javafx.event.*;
import javafx.geometry.*;
import java.util.*;

public class Lab8_Q1 extends Application
{
    private String str;
    private double result;

    private static int Precedence (String s)
    {
        if(s.equals("+") || s.equals("-"))
            return 1;
        else if(s.equals("x") || s.equals("/"))
            return 2;
        else
            return -1;
    }

    private String InfixToPostfix(String str)
    {
        String postfix = new String("");
        Stack<String> stack =new Stack<String>();

        int i = 0;

        for(int j = 0; j < str.length(); j++)
        {
            if(str.charAt(j) == '+' || str.charAt(j) == '-' || str.charAt(j) == 'x' ||
str.charAt(j) == '/')
            {
                postfix += str.substring(i, j) + " ";

                while (!stack.isEmpty() && Precedence(str.charAt(j) + "") <=
Precedence(stack.peek()))
```

```java
                    postfix += stack.pop() + " ";

                stack.push(str.charAt(j) + "");

                i = j + 1;
            }
            else if(j == (str.length()-1))
            {
                postfix += str.substring(i, j+1) + " ";
            }
        }

        while (!stack.isEmpty())
        {
            postfix += stack.pop() + " ";
        }

        return postfix;
    }

    private double EvaluatePostfix(String str)
    {
        result = 0.0;
        Stack<Double> stack = new Stack<Double>();

        for(int i = 0; i < str.length(); i++)
        {
            char ch = str.charAt(i);

            if(Character.isDigit(ch))
            {
                int j = i;
                for(; j < str.length(); j++)
                {
                    if(str.charAt(j) == ' ')
                        break;
                }

                stack.push(Double.parseDouble(str.substring(i, j)));
                ch = str.charAt(j);
                i = j;
            }
            else if(ch != ' ')
```

```java
            {
                double num1 = stack.pop();
                double num2 = stack.pop();

                if(ch == '+')
                    stack.push(num2 + num1);
                else if(ch == '-')
                    stack.push(num2 - num1);
                else if(ch == 'x')
                    stack.push(num2 * num1);
                else if(ch == '/')
                {
                    try
                    {
                        stack.push(num2 / num1);
                    }
                    catch(ArithmeticException ae)
                    {
                        System.out.println("Exception caught:" + ae.getMessage());
                        ae.printStackTrace();
                    }
                    catch(Exception e)
                    {
                        System.out.println("Exception caught:" + e.getMessage());
                        e.printStackTrace();
                    }
                }
            }
        }
    }
    result = (stack.pop()).doubleValue();
    return result;
}

public void start(Stage myStage)
{
    myStage.setTitle("JavaFX Calculator");

    TextField text = new TextField();
    text.setPrefColumnCount(22);
    text.setEditable(false);

    str = "";
```

```java
Button b1 = new Button("    7    ");

b1.setOnAction(new EventHandler<ActionEvent>()
{
   public void handle(ActionEvent ae)
   {
      if((text.getText()).equals(""))
         str = "";

      str = str + "7";
      text.setText(str);

   }
});

Button b2 = new Button("    8    ");
b2.setOnAction(new EventHandler<ActionEvent>()
{
   public void handle(ActionEvent ae)
   {
      if((text.getText()).equals(""))
         str = "";

      str = str + "8";
      text.setText(str);
   }
});

Button b3 = new Button("    9    ");
b3.setOnAction(new EventHandler<ActionEvent>()
{
   public void handle(ActionEvent ae)
   {
      if((text.getText()).equals(""))
         str = "";

      str = str + "9";
      text.setText(str);
   }
});

Button b4 = new Button("    +    ");
b4.setOnAction(new EventHandler<ActionEvent>()
```

```java
        {
           public void handle(ActionEvent ae)
           {
             if((text.getText()).equals(""))
                text.setText("Error");
             else
             {
                str = str + "+";
                text.setText(str);
             }
           }
        });

        Button b5 = new Button("     4     ");
        b5.setOnAction(new EventHandler<ActionEvent>()
        {
           public void handle(ActionEvent ae)
           {
             if((text.getText()).equals(""))
                str = "";

             str = str + "4";
             text.setText(str);
           }
        });

        Button b6 = new Button("     5     ");
        b6.setOnAction(new EventHandler<ActionEvent>()
        {
           public void handle(ActionEvent ae)
           {
             if((text.getText()).equals(""))
                str = "";

             str = str + "5";
             text.setText(str);
           }
        });

        Button b7 = new Button("     6     ");
        b7.setOnAction(new EventHandler<ActionEvent>()
        {
           public void handle(ActionEvent ae)
```

```java
            {
              if((text.getText()).equals(""))
                str = "";

              str = str + "6";
              text.setText(str);
            }
        });

        Button b8 = new Button("     -     ");
        b8.setOnAction(new EventHandler<ActionEvent>()
        {
            public void handle(ActionEvent ae)
            {
              if((text.getText()).equals(""))
                text.setText("Error");
              else
              {
                str = str + "-";
                text.setText(str);
              }
            }
        });

        Button b9 = new Button("     1     ");
        b9.setOnAction(new EventHandler<ActionEvent>()
        {
            public void handle(ActionEvent ae)
            {
              if((text.getText()).equals(""))
                str = "";

              str = str + "1";
              text.setText(str);
            }
        });

        Button b10 = new Button("     2     ");
        b10.setOnAction(new EventHandler<ActionEvent>()
        {
            public void handle(ActionEvent ae)
            {
              if((text.getText()).equals(""))
```

```java
            str = "";

        str = str + "2";
        text.setText(str);
      }
});

Button b11 = new Button("     3     ");
b11.setOnAction(new EventHandler<ActionEvent>()
{
   public void handle(ActionEvent ae)
   {
      if((text.getText()).equals(""))
         str = "";

      str = str + "3";
      text.setText(str);
   }
});

Button b12 = new Button("     x     ");
b12.setOnAction(new EventHandler<ActionEvent>()
{
   public void handle(ActionEvent ae)
   {
      if((text.getText()).equals(""))
         text.setText("Error");
      else
      {
         str = str + "x";
         text.setText(str);
      }
   }
});

Button b13 = new Button("     C     ");
b13.setOnAction(new EventHandler<ActionEvent>()
{
   public void handle(ActionEvent ae)
   {
      text.setText("");
      str = "";
      result = 0.0;
```

```java
            }
        });

        Button b14 = new Button("    0    ");
        b14.setOnAction(new EventHandler<ActionEvent>()
        {
            public void handle(ActionEvent ae)
            {
                if((text.getText()).equals(""))
                    str = "";

                str = str + "0";
                text.setText(str);
            }
        });

        Button b15 = new Button("    =    ");
        b15.setOnAction(new EventHandler<ActionEvent>()
        {
            public void handle(ActionEvent ae)
            {
                if((text.getText()).equals(""))
                    text.setText("Error");
                else
                    text.setText(EvaluatePostfix(InfixToPostfix(str)) + "");
            }
        });

        Button b16 = new Button("    /    ");
        b16.setOnAction(new EventHandler<ActionEvent>()
        {
            public void handle(ActionEvent ae)
            {
                if((text.getText()).equals(""))
                    text.setText("Error");
                else
                {
                    str = str + "/";
                    text.setText(str);
                }
            }
        });
```

```
        FlowPane rootNode = new FlowPane(5, 7);
        rootNode.setAlignment(Pos.CENTER);
        rootNode.setPadding(new Insets(10, 10, 10, 10));

        Scene myScene = new Scene(rootNode, 285, 180);
        myStage.setScene(myScene);

        rootNode.getChildren().add(text);
        rootNode.getChildren().addAll(b1, b2, b3, b4, b5, b6, b7, b8, b9, b10, b11,
b12, b13, b14, b15, b16);
        myStage.show();
    }

    public static void main(String[] args)
    {
        launch(args);
    }
}
```

Output:

JavaFX Calculator

15.0			
7	8	9	+
4	5	6	-
1	2	3	x
C	0	=	/

JavaFX Calculator

78-56			
7	8	9	+
4	5	6	-
1	2	3	x
C	0	=	/

JavaFX Calculator

22.0			
7	8	9	+
4	5	6	-
1	2	3	x
C	0	=	/

JavaFX Calculator

74x3			
7	8	9	+
4	5	6	-
1	2	3	x
C	0	=	/

JavaFX Calculator

222.0			
7	8	9	+
4	5	6	-
1	2	3	x
C	0	=	/

JavaFX Calculator

78/10			
7	8	9	+
4	5	6	-
1	2	3	x
C	0	=	/

JavaFX Calculator

7.8			
7	8	9	+
4	5	6	-
1	2	3	x
C	0	=	/

JavaFX Calculator

78+89x6-85/2-23			
7	8	9	+
4	5	6	-
1	2	3	x
C	0	=	/

JavaFX Calculator — □ ✕

546.5

7	8	9	+
4	5	6	-
1	2	3	x
C	0	=	/