

A large, light pink brushstroke graphic that serves as a background for the text. It has a soft, painterly texture with visible brush marks and a slightly irregular, organic shape.

PRESENTED BY

Riya Chandrakantbhai Bhimani

Email : riyabhimani.me@gmail.com

Project-1 : Calculator Built In Java

- **Abstract :**

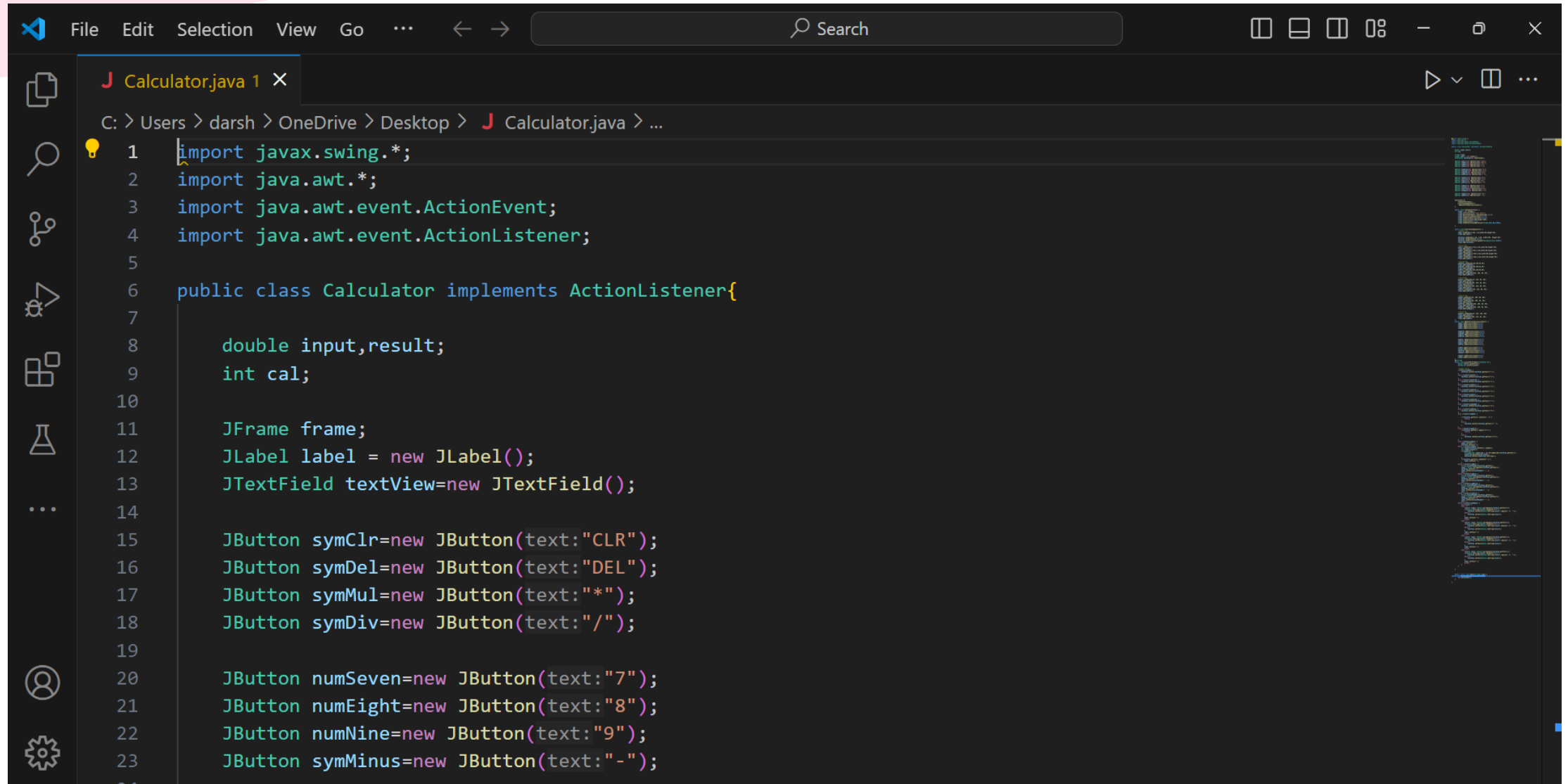
- This project presents the development of a simple, user-friendly **Calculator** application built using **Java**. The calculator is designed to perform basic arithmetic operations, including addition, subtraction, multiplication, and division, with an intuitive graphical user interface (GUI) created using **Swing**. The objective of the project is to provide users with a functional calculator that emulates the behavior of a standard physical calculator, allowing for real-time calculation inputs and results display.

Project-1 : Calculator Built In Java

- **Introduction:**

- Calculators are essential tools for performing mathematical operations, ranging from simple arithmetic to complex equations. This project aims to create a basic calculator application that allows users to execute simple calculations easily. Java, a widely-used programming language, is chosen for this project due to its platform independence and robust libraries for GUI development. The application will focus on providing a smooth user experience while ensuring that all calculations are accurate and efficient

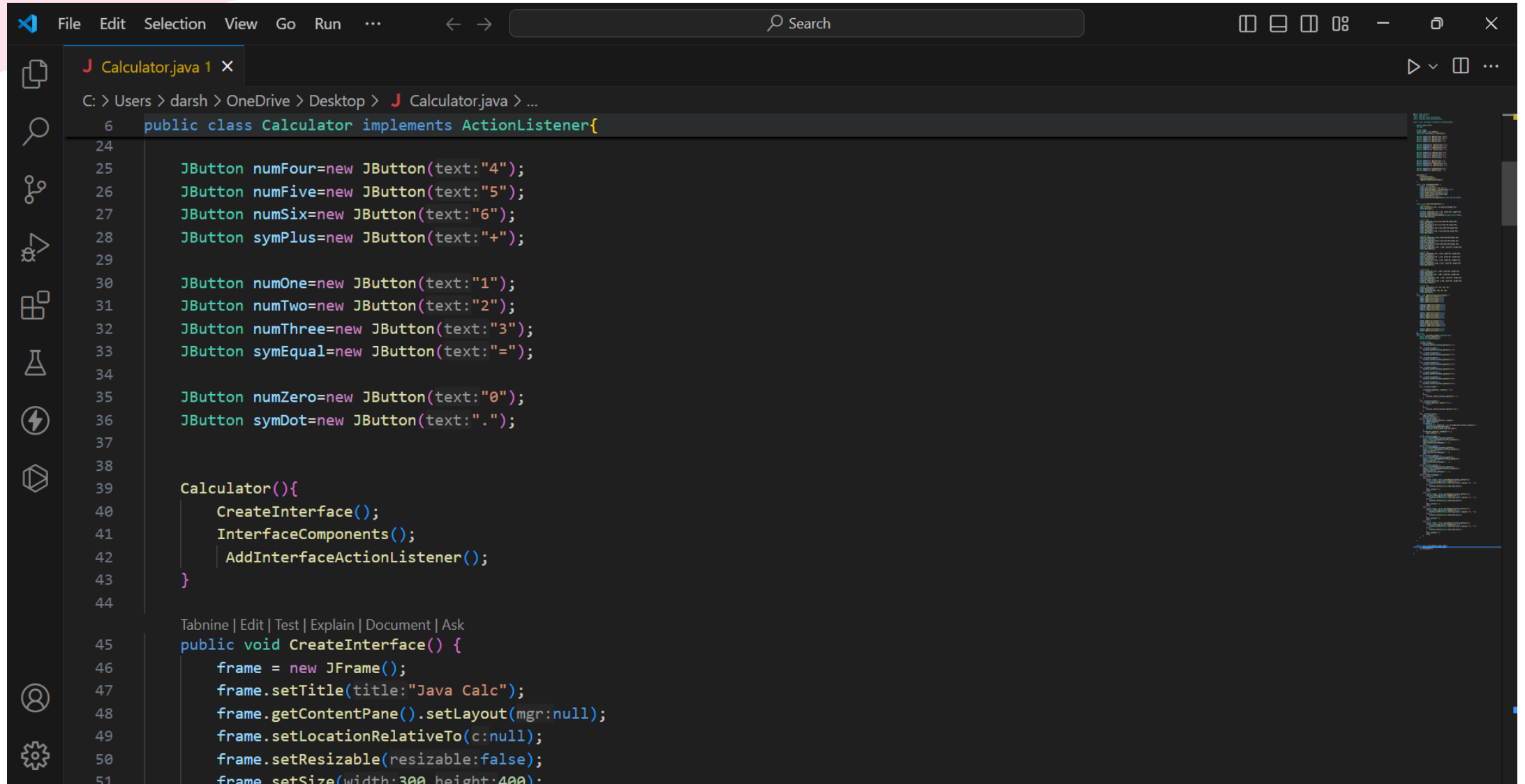
Project-1 : Calculator Built In Java



The screenshot shows an IDE window with the file 'Calculator.java' open. The code is as follows:

```
1 import javax.swing.*;
2 import java.awt.*;
3 import java.awt.event.ActionEvent;
4 import java.awt.event.ActionListener;
5
6 public class Calculator implements ActionListener{
7
8     double input,result;
9     int cal;
10
11     JFrame frame;
12     JLabel label = new JLabel();
13     JTextField textView=new JTextField();
14
15     JButton symClr=new JButton(text:"CLR");
16     JButton symDel=new JButton(text:"DEL");
17     JButton symMul=new JButton(text:"*");
18     JButton symDiv=new JButton(text:"/");
19
20     JButton numSeven=new JButton(text:"7");
21     JButton numEight=new JButton(text:"8");
22     JButton numNine=new JButton(text:"9");
23     JButton symMinus=new JButton(text:"-");
```

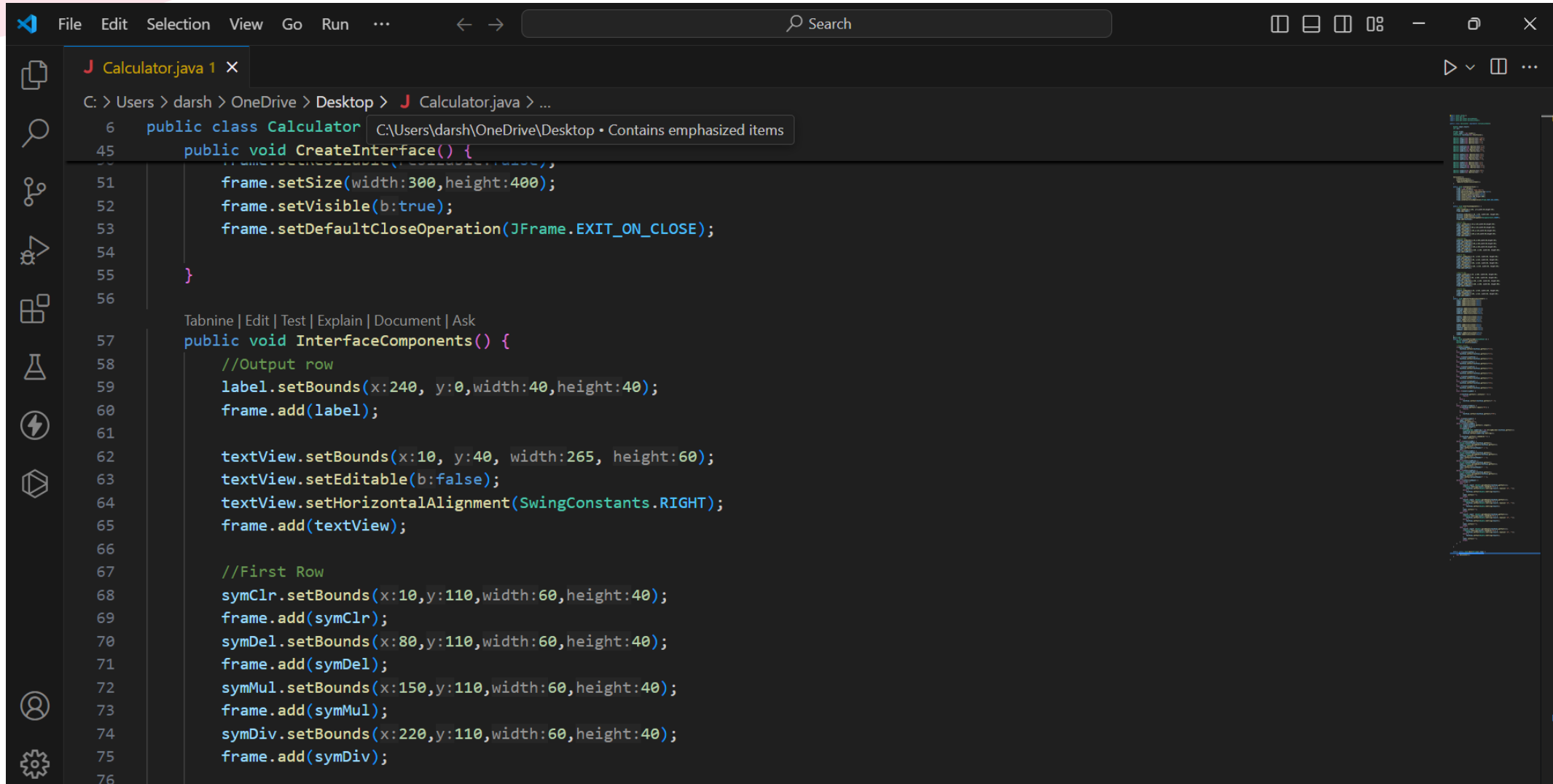
Project-1 : Calculator Built In Java



The image shows a screenshot of an IDE (likely IntelliJ IDEA) with a dark theme. The main editor window displays the code for a Java class named `Calculator`, which implements the `ActionListener` interface. The code is written in a syntax-highlighted manner. The file name `Calculator.java` is visible in the tab bar at the top. The menu bar at the top includes `File`, `Edit`, `Selection`, `View`, `Go`, `Run`, and a search bar. The left sidebar contains icons for file explorer, search, and other IDE features. The right sidebar shows a list of files in the project. The code in the editor is as follows:

```
6 public class Calculator implements ActionListener{
24
25     JButton numFour=new JButton(text:"4");
26     JButton numFive=new JButton(text:"5");
27     JButton numSix=new JButton(text:"6");
28     JButton symPlus=new JButton(text:"+");
29
30     JButton numOne=new JButton(text:"1");
31     JButton numTwo=new JButton(text:"2");
32     JButton numThree=new JButton(text:"3");
33     JButton symEqual=new JButton(text:"=");
34
35     JButton numZero=new JButton(text:"0");
36     JButton symDot=new JButton(text:".");
37
38
39     Calculator(){
40         CreateInterface();
41         InterfaceComponents();
42         AddInterfaceActionListener();
43     }
44
45     Tabnine | Edit | Test | Explain | Document | Ask
46     public void CreateInterface() {
47         frame = new JFrame();
48         frame.setTitle(title:"Java Calc");
49         frame.getContentPane().setLayout(mgr:null);
50         frame.setLocationRelativeTo(c:null);
51         frame.setResizable(resizable:false);
52         frame.setSize(width:300,height:400);
```

Project-1 : Calculator Built In Java

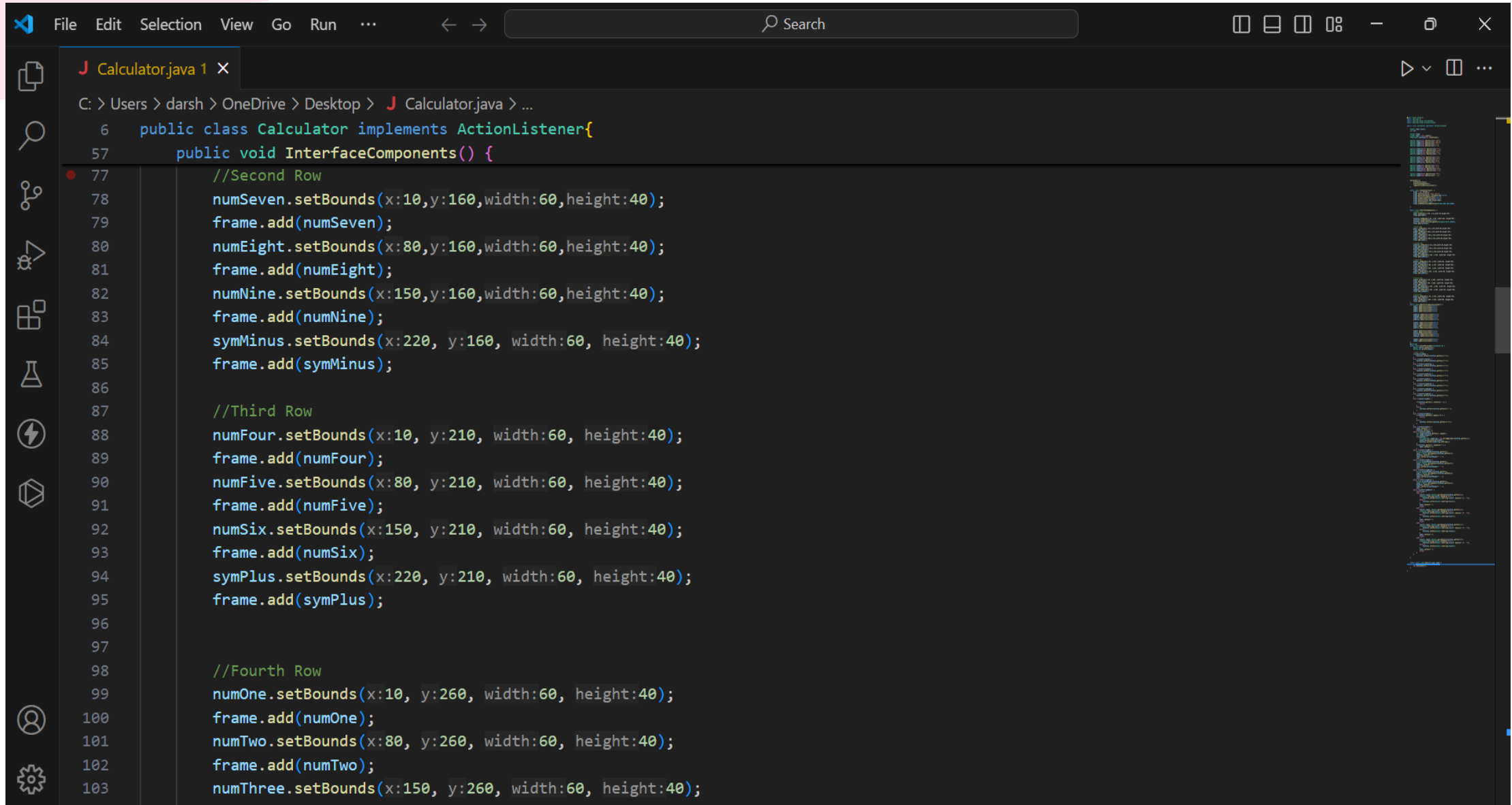


The screenshot shows an IDE window with a dark theme. The title bar includes standard window controls and a search bar. The editor displays the file `Calculator.java` with the following code:

```
6 public class Calculator {
45     public void CreateInterface() {
51         frame.setSize(width:300,height:400);
52         frame.setVisible(b:true);
53         frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
54     }
55 }
56
57 public void InterfaceComponents() {
58     //Output row
59     label.setBounds(x:240, y:0,width:40,height:40);
60     frame.add(label);
61
62     textView.setBounds(x:10, y:40, width:265, height:60);
63     textView.setEditable(b:false);
64     textView.setHorizontalAlignment(SwingConstants.RIGHT);
65     frame.add(textView);
66
67     //First Row
68     symClr.setBounds(x:10,y:110,width:60,height:40);
69     frame.add(symClr);
70     symDel.setBounds(x:80,y:110,width:60,height:40);
71     frame.add(symDel);
72     symMul.setBounds(x:150,y:110,width:60,height:40);
73     frame.add(symMul);
74     symDiv.setBounds(x:220,y:110,width:60,height:40);
75     frame.add(symDiv);
76 }
```

The IDE interface includes a sidebar on the left with icons for Explorer, Search, Source Control, Run and Debug, Extensions, Testing, Remote Explorer, and User Interface. The bottom status bar shows the text "Tabnine | Edit | Test | Explain | Document | Ask".

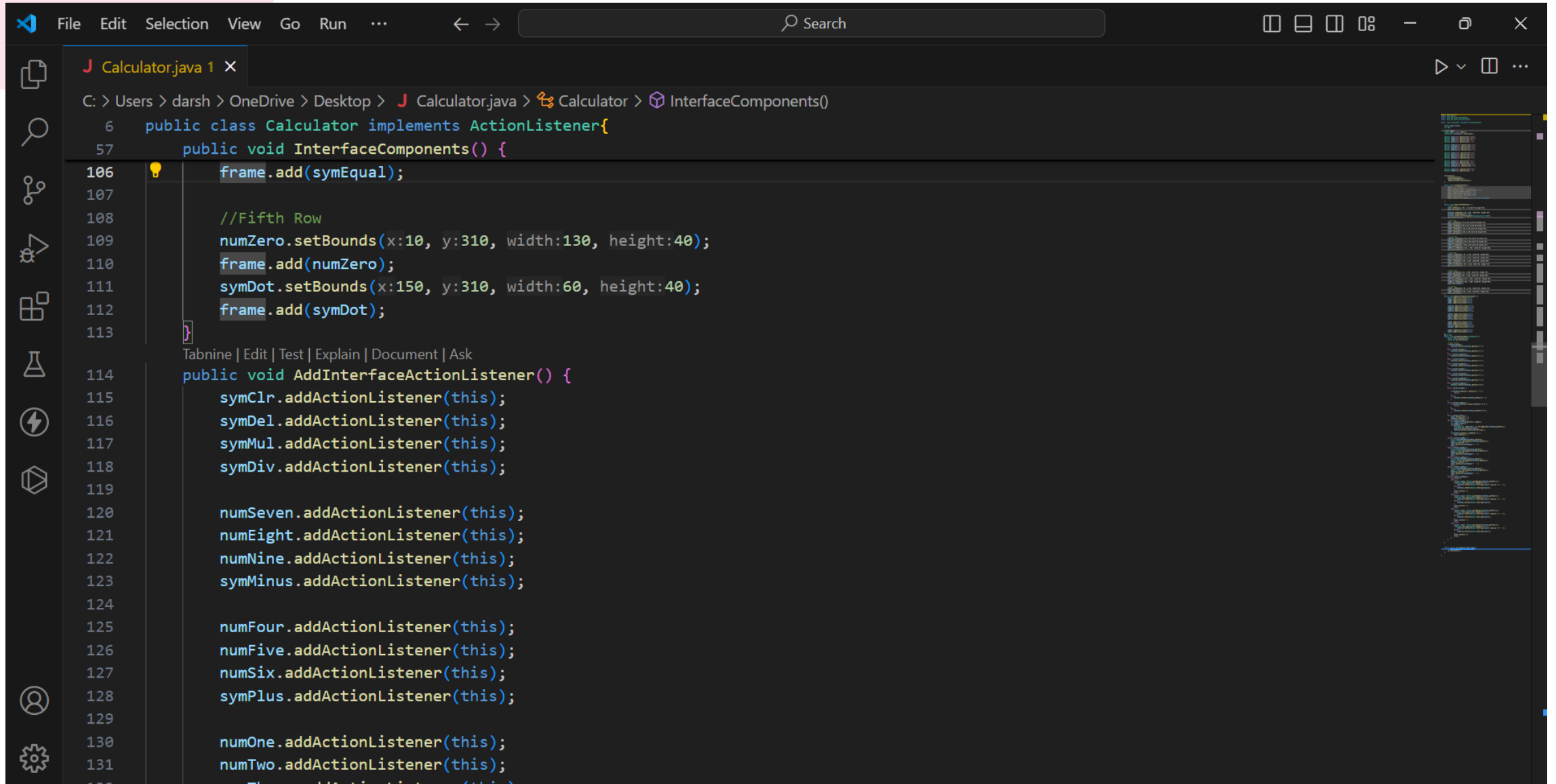
Project-1 : Calculator Built In Java



The image shows a screenshot of an IDE window titled "Calculator.java 1 X". The file path is "C: > Users > darsh > OneDrive > Desktop > J Calculator.java > ...". The code is a Java class named "Calculator" that implements the "ActionListener" interface. It defines a method "InterfaceComponents()" which sets up the GUI components for the calculator. The components are organized into four rows:

```
6 public class Calculator implements ActionListener{
57     public void InterfaceComponents() {
77         //Second Row
78         numSeven.setBounds(x:10,y:160,width:60,height:40);
79         frame.add(numSeven);
80         numEight.setBounds(x:80,y:160,width:60,height:40);
81         frame.add(numEight);
82         numNine.setBounds(x:150,y:160,width:60,height:40);
83         frame.add(numNine);
84         symMinus.setBounds(x:220, y:160, width:60, height:40);
85         frame.add(symMinus);
86
87         //Third Row
88         numFour.setBounds(x:10, y:210, width:60, height:40);
89         frame.add(numFour);
90         numFive.setBounds(x:80, y:210, width:60, height:40);
91         frame.add(numFive);
92         numSix.setBounds(x:150, y:210, width:60, height:40);
93         frame.add(numSix);
94         symPlus.setBounds(x:220, y:210, width:60, height:40);
95         frame.add(symPlus);
96
97
98         //Fourth Row
99         numOne.setBounds(x:10, y:260, width:60, height:40);
100        frame.add(numOne);
101        numTwo.setBounds(x:80, y:260, width:60, height:40);
102        frame.add(numTwo);
103        numThree.setBounds(x:150, y:260, width:60, height:40);
```

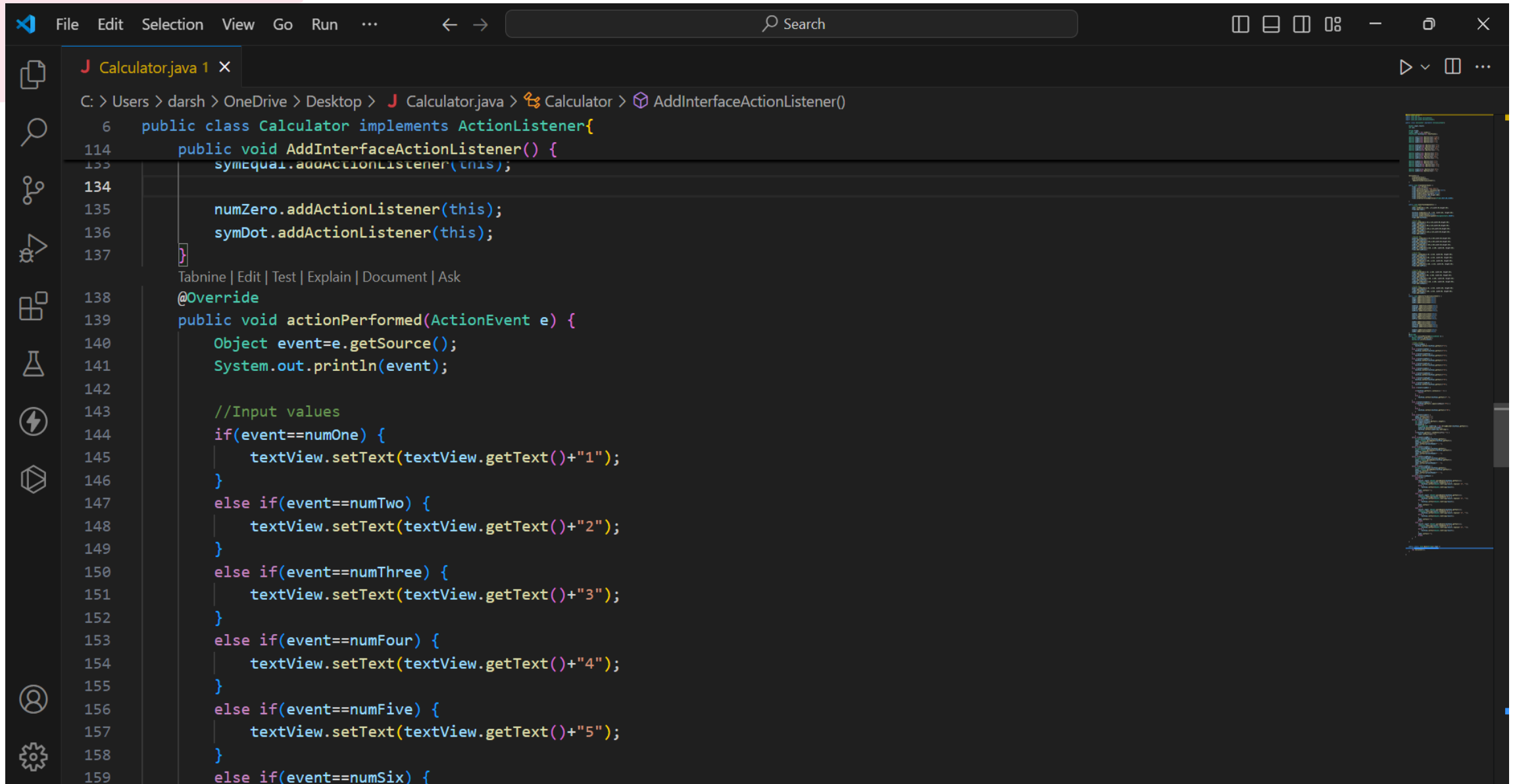
Project-1 : Calculator Built In Java



The image shows a screenshot of an IDE (likely IntelliJ IDEA) with a dark theme. The main editor window displays the code for `Calculator.java`. The code is organized into two main sections: `InterfaceComponents()` and `AddInterfaceActionListener()`. The `InterfaceComponents()` method sets up the GUI components, including buttons for numbers, operators, and a display. The `AddInterfaceActionListener()` method defines the logic for each button click, such as adding, subtracting, multiplying, and dividing numbers. The code is well-commented and uses standard Java syntax for GUI development.

```
6 public class Calculator implements ActionListener{
57 public void InterfaceComponents() {
106     frame.add(symEqual);
107
108     //Fifth Row
109     numZero.setBounds(x:10, y:310, width:130, height:40);
110     frame.add(numZero);
111     symDot.setBounds(x:150, y:310, width:60, height:40);
112     frame.add(symDot);
113 }
114 public void AddInterfaceActionListener() {
115     symClr.addActionListener(this);
116     symDel.addActionListener(this);
117     symMul.addActionListener(this);
118     symDiv.addActionListener(this);
119
120     numSeven.addActionListener(this);
121     numEight.addActionListener(this);
122     numNine.addActionListener(this);
123     symMinus.addActionListener(this);
124
125     numFour.addActionListener(this);
126     numFive.addActionListener(this);
127     numSix.addActionListener(this);
128     symPlus.addActionListener(this);
129
130     numOne.addActionListener(this);
131     numTwo.addActionListener(this);
132     numThree.addActionListener(this);
```

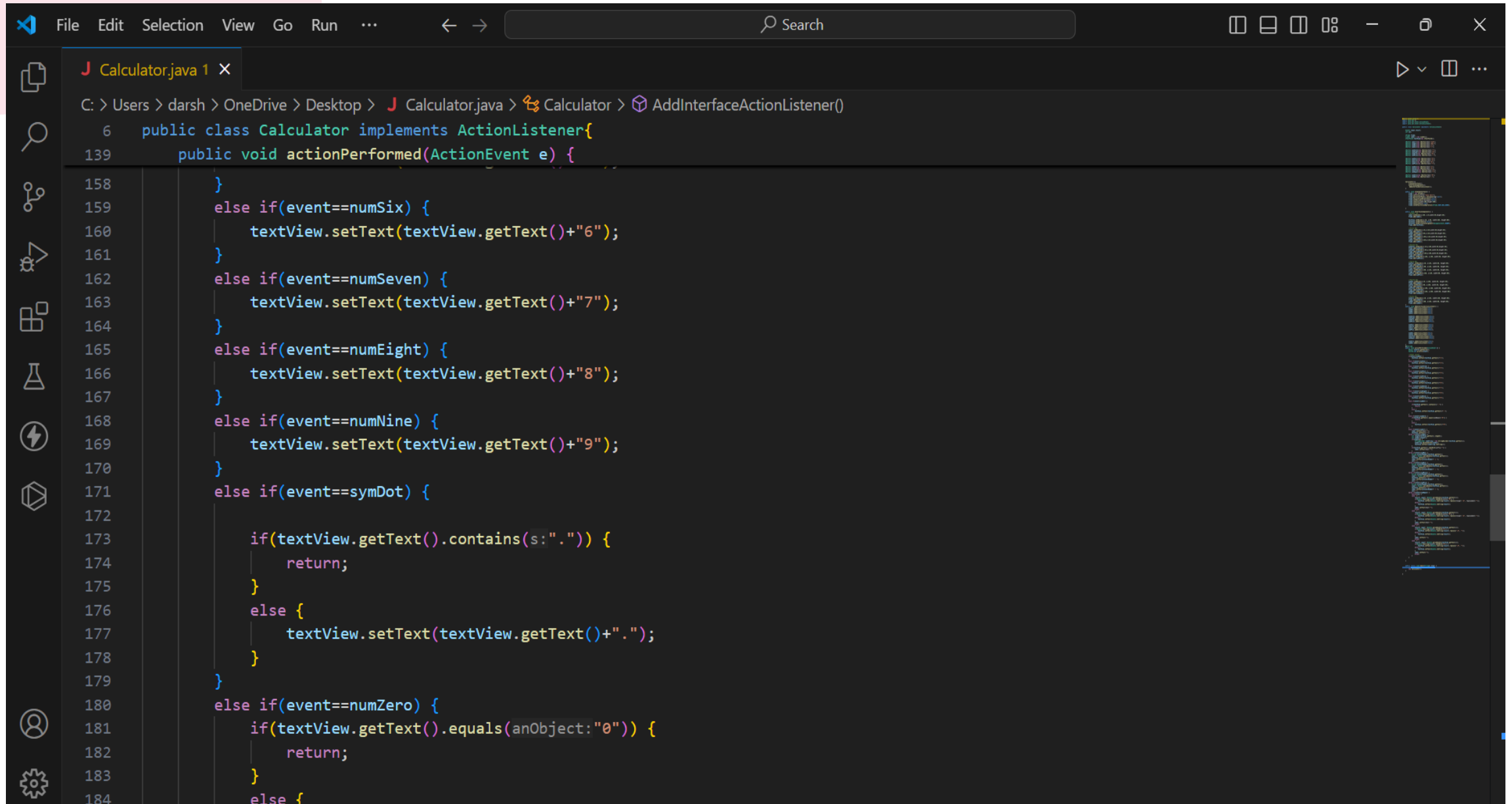

Project-1 : Calculator Built In Java



The screenshot shows an IDE window with a dark theme. The top menu bar includes File, Edit, Selection, View, Go, Run, and a search bar. The file explorer on the left shows the project structure: C:\Users\darsh\OneDrive\Desktop\J Calculator.java > Calculator > AddInterfaceActionListener(). The main editor displays the following Java code:

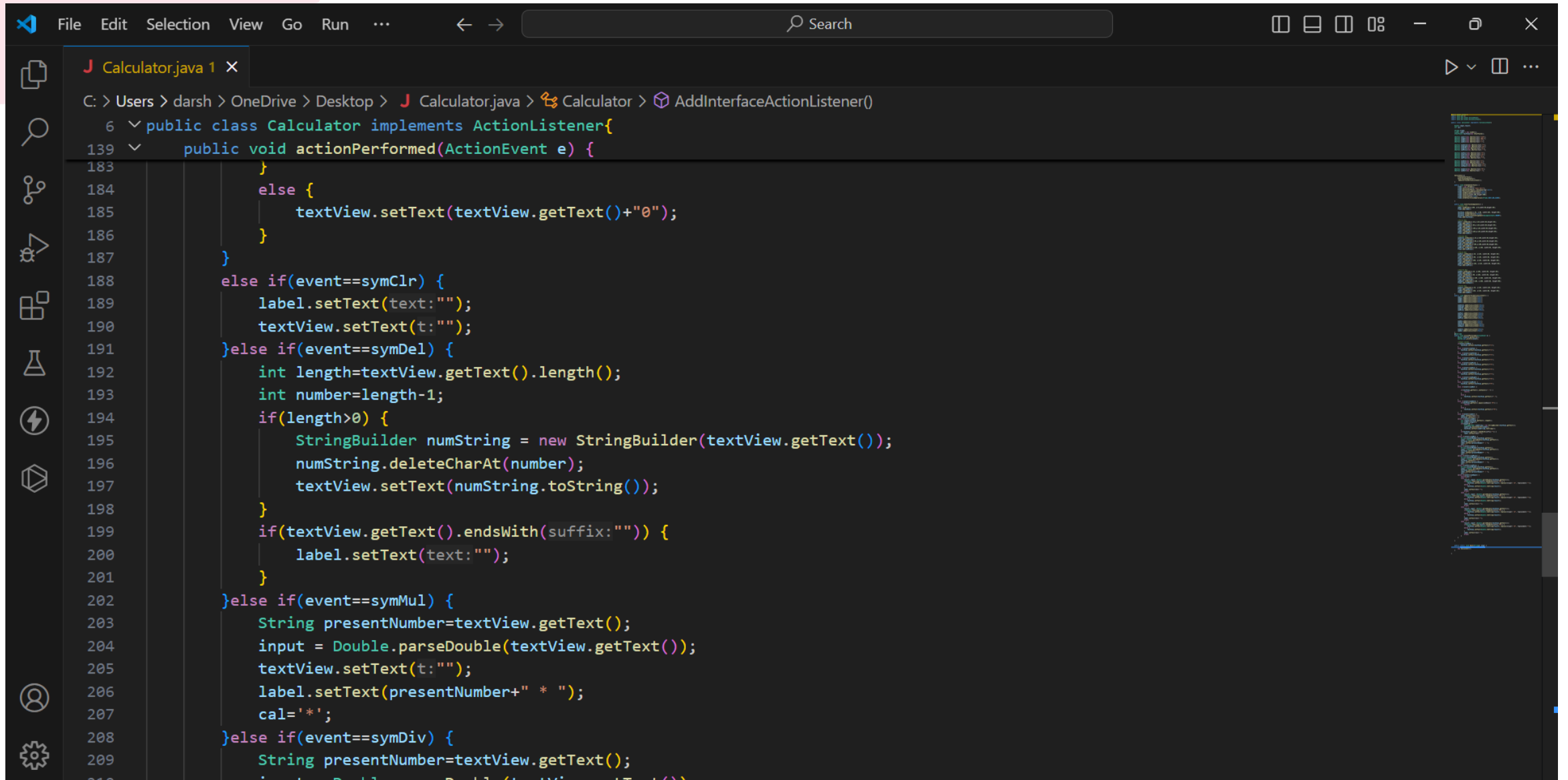
```
6 public class Calculator implements ActionListener{
114     public void AddInterfaceActionListener() {
133         symEqual.addActionListener(this);
134
135         numZero.addActionListener(this);
136         symDot.addActionListener(this);
137     }
138
139     @Override
140     public void actionPerformed(ActionEvent e) {
141         Object event=e.getSource();
142         System.out.println(event);
143
144         //Input values
145         if(event==numOne) {
146             textView.setText(textView.getText()+"1");
147         }
148         else if(event==numTwo) {
149             textView.setText(textView.getText()+"2");
150         }
151         else if(event==numThree) {
152             textView.setText(textView.getText()+"3");
153         }
154         else if(event==numFour) {
155             textView.setText(textView.getText()+"4");
156         }
157         else if(event==numFive) {
158             textView.setText(textView.getText()+"5");
159         }
160         else if(event==numSix) {
```

Project-1 : Calculator Built In Java

A screenshot of an IDE window titled "Calculator.java 1 X". The menu bar includes File, Edit, Selection, View, Go, Run, and a search bar. The breadcrumb path is "C:\> Users > darsh > OneDrive > Desktop > Calculator.java > Calculator > AddInterfaceActionListener()". The code is a Java class implementing ActionListener, with methods for handling button clicks for digits 6-9, a decimal point, and a zero button. The code is as follows:

```
6 public class Calculator implements ActionListener{
139 public void actionPerformed(ActionEvent e) {
158 }
159 else if(event==numSix) {
160     textView.setText(textView.getText()+"6");
161 }
162 else if(event==numSeven) {
163     textView.setText(textView.getText()+"7");
164 }
165 else if(event==numEight) {
166     textView.setText(textView.getText()+"8");
167 }
168 else if(event==numNine) {
169     textView.setText(textView.getText()+"9");
170 }
171 else if(event==symDot) {
172     if(textView.getText().contains(s:".")) {
173         return;
174     }
175     else {
176         textView.setText(textView.getText()+".");
177     }
178 }
179 }
180 else if(event==numZero) {
181     if(textView.getText().equals(anObject:"0")) {
182         return;
183     }
184     else {
```

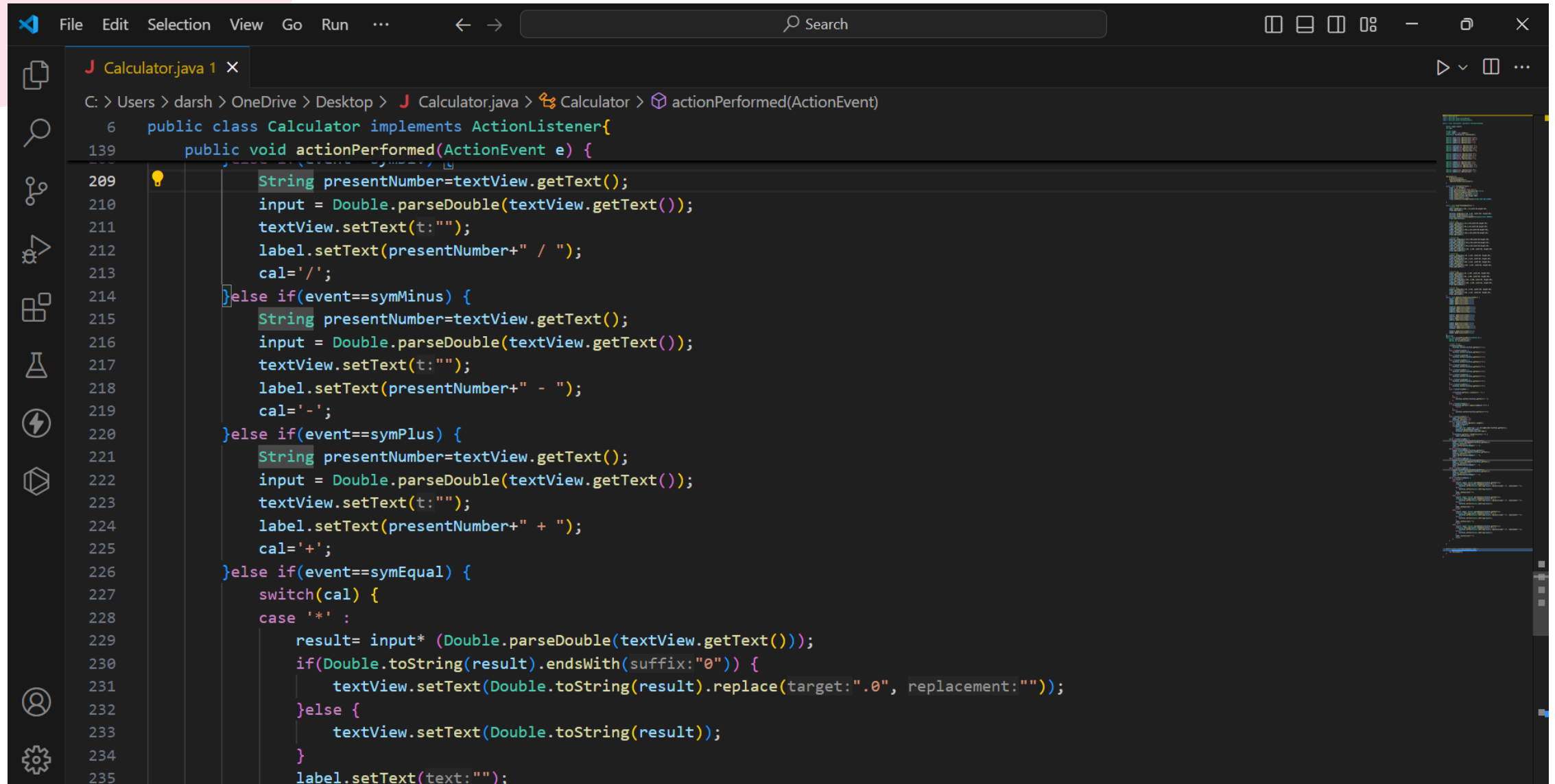
Project-1 : Calculator Built In Java



The image shows a screenshot of an IDE (likely IntelliJ IDEA) with a dark theme. The main editor window displays a Java file named `Calculator.java`. The code is implementing the `ActionListener` interface for a calculator. The visible code includes the `actionPerformed` method, which handles various button clicks. The code is as follows:

```
6 public class Calculator implements ActionListener{
139 public void actionPerformed(ActionEvent e) {
183     }
184     else {
185         textView.setText(textView.getText()+"0");
186     }
187 }
188 else if(event==symClr) {
189     label.setText(text:"");
190     textView.setText(t:"");
191 }else if(event==symDel) {
192     int length=textView.getText().length();
193     int number=length-1;
194     if(length>0) {
195         StringBuilder numString = new StringBuilder(textView.getText());
196         numString.deleteCharAt(number);
197         textView.setText(numString.toString());
198     }
199     if(textView.getText().endsWith(suffix:"")) {
200         label.setText(text:"");
201     }
202 }else if(event==symMul) {
203     String presentNumber=textView.getText();
204     input = Double.parseDouble(textView.getText());
205     textView.setText(t:"");
206     label.setText(presentNumber+" * ");
207     cal='*';
208 }else if(event==symDiv) {
209     String presentNumber=textView.getText();
210     input = Double.parseDouble(textView.getText());
```

Project-1 : Calculator Built In Java

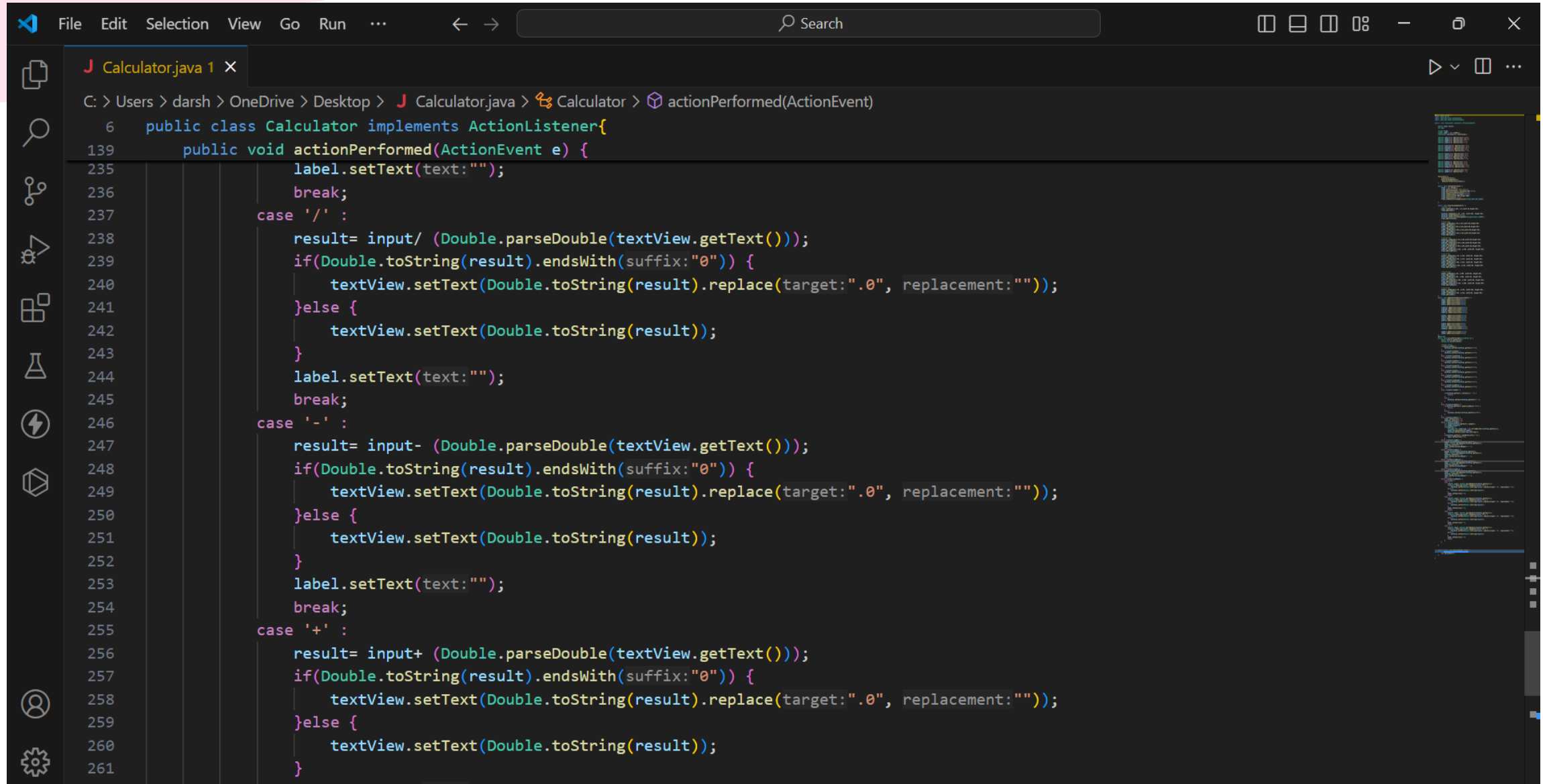


The image shows a screenshot of an IDE with a dark theme. The top menu bar includes File, Edit, Selection, View, Go, Run, and a search bar. The file explorer on the left shows a project named 'Calculator' with a file 'Calculator.java'. The main editor displays the code for the 'actionPerformed' method of a 'Calculator' class that implements 'ActionListener'. The code handles division, subtraction, addition, and multiplication operations, updating the text view and label accordingly. A lightbulb icon indicates a suggestion or warning at line 209.

```
C:\> Users > darsh > OneDrive > Desktop > J Calculator.java > Calculator > actionPerformed(ActionEvent)

6  public class Calculator implements ActionListener{
139 public void actionPerformed(ActionEvent e) {
209     String presentNumber=textView.getText();
210     input = Double.parseDouble(textView.getText());
211     textView.setText("");
212     label.setText(presentNumber+" / ");
213     cal='/';
214 }else if(event==symMinus) {
215     String presentNumber=textView.getText();
216     input = Double.parseDouble(textView.getText());
217     textView.setText("");
218     label.setText(presentNumber+" - ");
219     cal='-';
220 }else if(event==symPlus) {
221     String presentNumber=textView.getText();
222     input = Double.parseDouble(textView.getText());
223     textView.setText("");
224     label.setText(presentNumber+" + ");
225     cal='+';
226 }else if(event==symEqual) {
227     switch(cal) {
228     case '*' :
229         result= input* (Double.parseDouble(textView.getText()));
230         if(Double.toString(result).endsWith(suffix:"0")) {
231             textView.setText(Double.toString(result).replace(target:".0", replacement:""));
232         }else {
233             textView.setText(Double.toString(result));
234         }
235     label.setText(text:"");
```

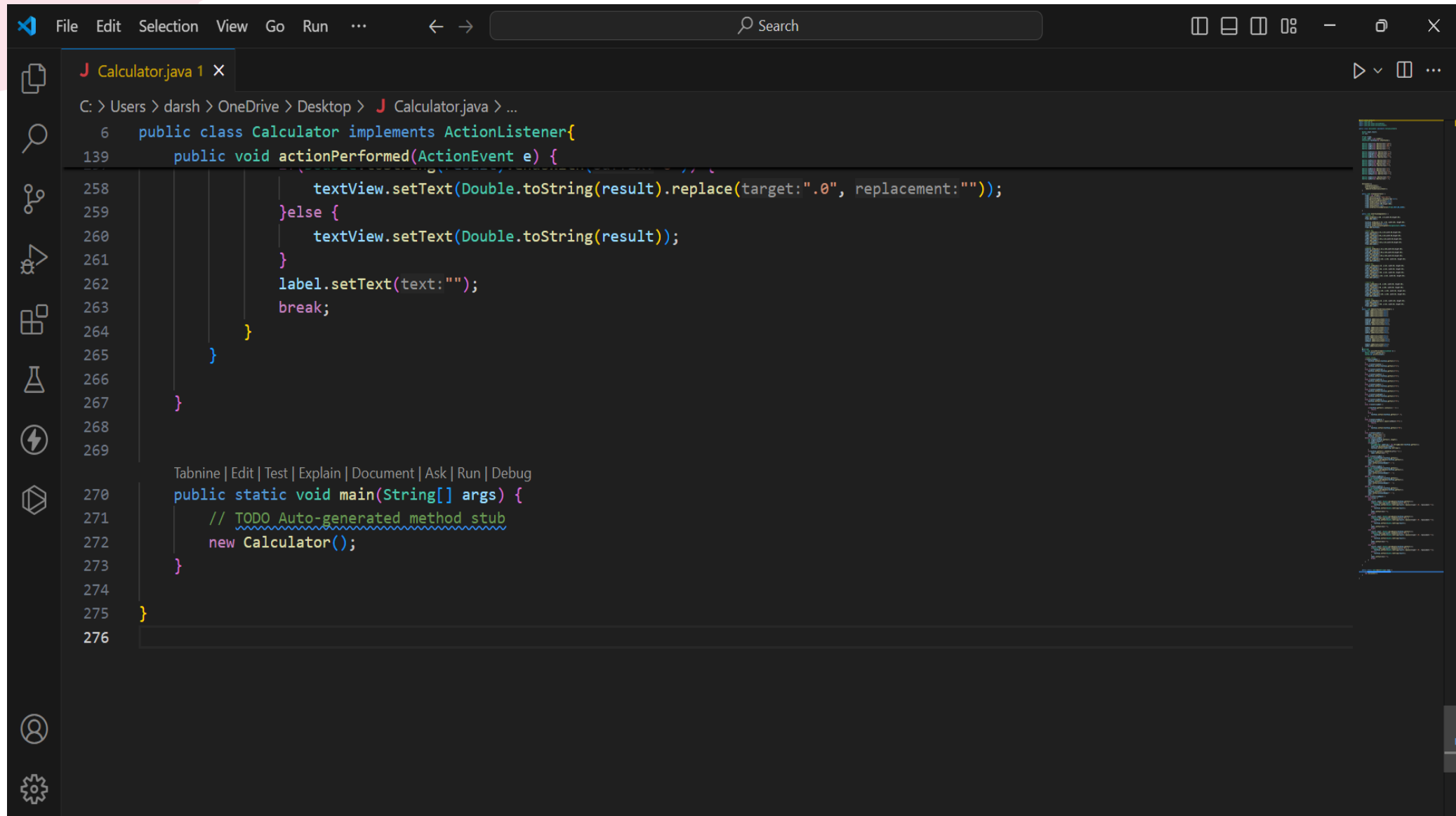
Project-1 : Calculator Built In Java



```
File Edit Selection View Go Run ... Search
Calculator.java 1 X
C: > Users > darsh > OneDrive > Desktop > Calculator.java > Calculator > actionPerformed(ActionEvent)

6 public class Calculator implements ActionListener{
139     public void actionPerformed(ActionEvent e) {
235         label.setText(text:"");
236         break;
237         case '/' :
238             result= input/ (Double.parseDouble(textView.getText()));
239             if(Double.toString(result).endsWith(suffix:"0")) {
240                 textView.setText(Double.toString(result).replace(target:".0", replacement:""));
241             }else {
242                 textView.setText(Double.toString(result));
243             }
244             label.setText(text:"");
245             break;
246         case '-' :
247             result= input- (Double.parseDouble(textView.getText()));
248             if(Double.toString(result).endsWith(suffix:"0")) {
249                 textView.setText(Double.toString(result).replace(target:".0", replacement:""));
250             }else {
251                 textView.setText(Double.toString(result));
252             }
253             label.setText(text:"");
254             break;
255         case '+' :
256             result= input+ (Double.parseDouble(textView.getText()));
257             if(Double.toString(result).endsWith(suffix:"0")) {
258                 textView.setText(Double.toString(result).replace(target:".0", replacement:""));
259             }else {
260                 textView.setText(Double.toString(result));
261             }
}
```

Project-1 : Calculator Built In Java



The screenshot shows an IDE window with a dark theme. The top menu bar includes File, Edit, Selection, View, Go, Run, and a search bar. The file explorer on the left shows a project named 'Calculator.java'. The main editor displays the following Java code:

```
6 public class Calculator implements ActionListener{
139 public void actionPerformed(ActionEvent e) {
258     textView.setText(Double.toString(result).replace(target:".0", replacement:""));
259 }else {
260     textView.setText(Double.toString(result));
261 }
262 label.setText(text:"");
263 break;
264 }
265 }
266
267 }
268
269
270 Tabnine | Edit | Test | Explain | Document | Ask | Run | Debug
271 public static void main(String[] args) {
272     // TODO Auto-generated method stub
273     new Calculator();
274 }
275 }
276 }
```

Project-1 : Calculator Built In Java



Project-1 : Calculator Built In Java



Project-1 : Calculator Built In Java

- **Conclusion:**

- The development of the **Calculator** application in **Java** demonstrates a successful implementation of a basic arithmetic tool with a user-friendly graphical user interface (GUI). The project effectively integrates Java's **Swing** library for front-end design and follows object-oriented programming (OOP) principles for backend logic, making the application modular and easy to maintain. The calculator performs fundamental arithmetic operations accurately, while handling potential errors such as division by zero gracefully.