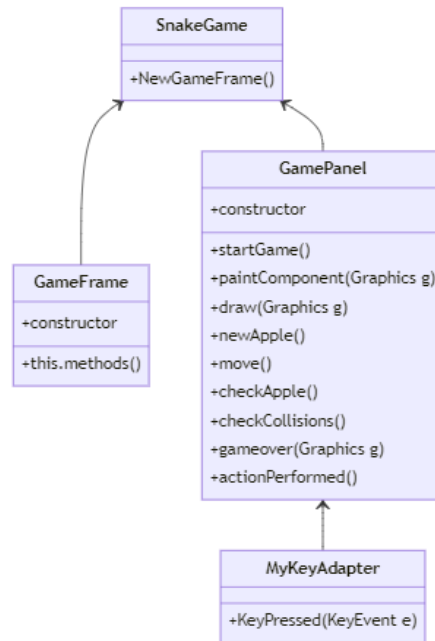


IMPLEMENTATION MANUAL



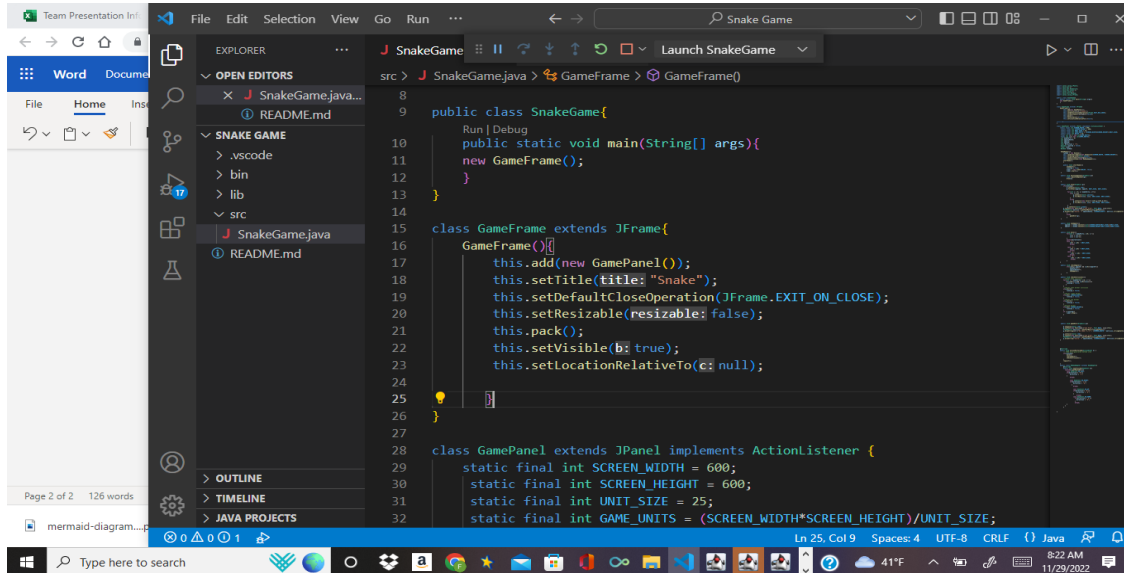
The diagram above shows the basic and the key structure of the whole program. It has three different classes with one additional interclass called “MyKeyAdapter.”

*Starting with the class that holds the main method called “SnakeGame,” has one method called “new GameFrame()” which is the shortcut form of the instance “GameFrame.”

* The second class is called “GameFrame” which is in charge of creating the key frame of the game. It extends JFrame, which is a top-level container that provides a window on the screen. This class only holds the construction of the frame. With “this. (methods)” the frame can be constructed as desired, such as for setting the

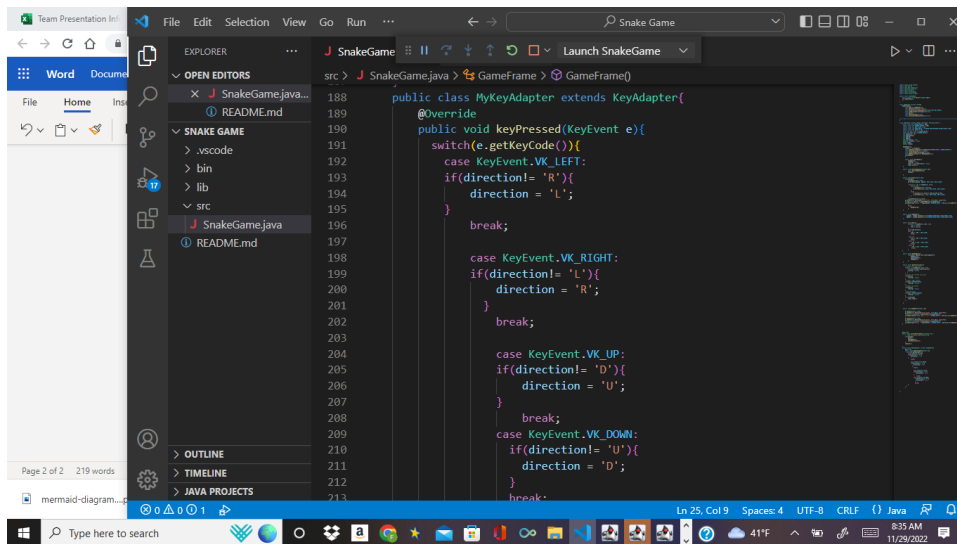
title, “this.setTitle(“Snake”)” is used, and to make the frame visible

“this.setVisible(true);” is used etc.

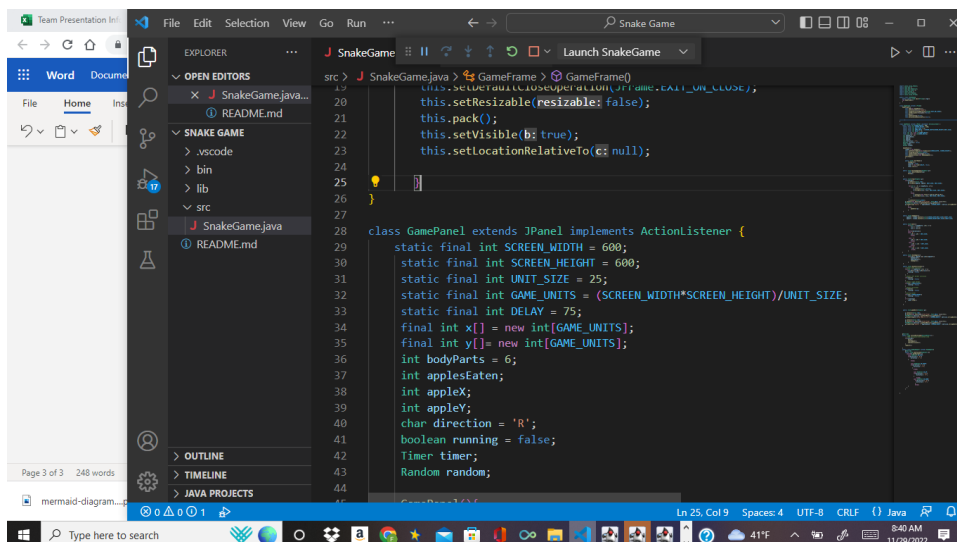
A screenshot of a code editor window titled "Snake Game". The editor shows the source code for a Java application. The code includes a main class "SnakeGame" with a "main" method that creates a "GameFrame" object. The "GameFrame" class extends "JFrame" and contains a constructor that sets the title to "Snake", sets the default close operation to "EXIT_ON_CLOSE", sets the frame to be non-resizable, calls "pack()", sets the frame to be visible, and sets the location relative to the center. The "GameFrame" class also contains a "GamePanel" class that extends "JPanel" and implements the "ActionListener" interface. The "GamePanel" class has static final variables for "SCREEN_WIDTH", "SCREEN_HEIGHT", "UNIT_SIZE", and "GAME_UNITS". The code is written in Java and uses standard syntax for class declarations, method calls, and variable assignments. The IDE interface includes a sidebar with a file explorer showing the project structure, a search bar, and a status bar at the bottom displaying the current line and column (Ln 25, Col 9) and the file encoding (UTF-8).

```
8  
9 public class SnakeGame{  
10     Run | Debug  
11     public static void main(String[] args){  
12         new GameFrame();  
13     }  
14  
15     class GameFrame extends JFrame{  
16         GameFrame(){  
17             this.add(new GamePanel());  
18             this.setTitle(title: "Snake");  
19             this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);  
20             this.setResizable(resizable: false);  
21             this.pack();  
22             this.setVisible(b: true);  
23             this.setLocationRelativeTo(c: null);  
24         }  
25  
26     }  
27  
28     class GamePanel extends JPanel implements ActionListener {  
29         static final int SCREEN_WIDTH = 600;  
30         static final int SCREEN_HEIGHT = 600;  
31         static final int UNIT_SIZE = 25;  
32         static final int GAME_UNITS = (SCREEN_WIDTH*SCREEN_HEIGHT)/UNIT_SIZE;
```

*Everything else regarding the building will be handled on the “GamePanel” class, which extends JPanel, which is a part of the Java Swing package, a container that can store a group of components. Then it implements ActionListener interface, which handles all action events when the user clicks on a component. It has an Overridden unimplemented method to perform the actions as the users want. The GamePanel class has an interclass called “MyKeyAdapter” which extends KeyAdapter, it controls and performs the keys/arrow/direction in order to command the snake object to move with switch statements by the method called “KeyPressed”.



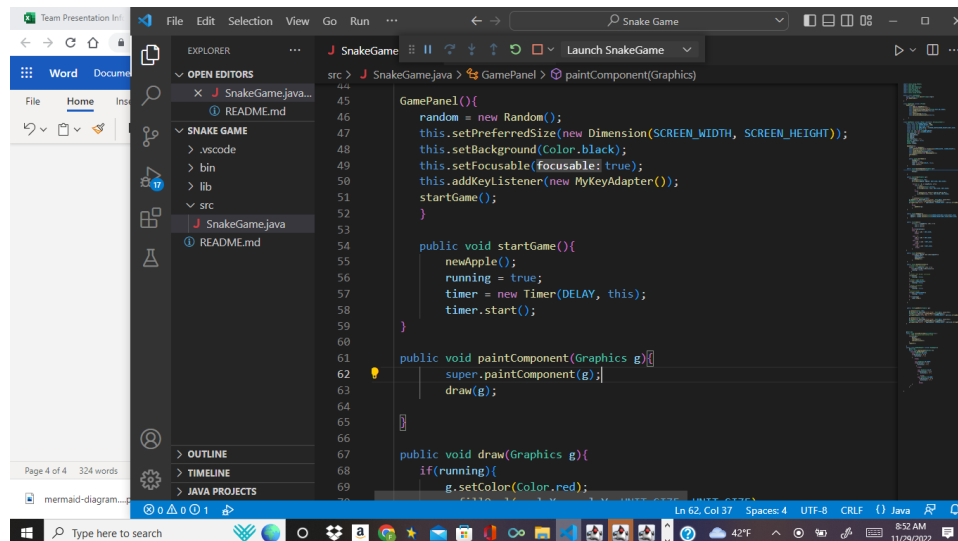
*Before constructing the “GamePanel” itself, some things need to be declared or initialized such as the dimensions of the panel, unit size, timer, bodyparts of the objects and X and Y co-ordinates of the objects as they move etc.



*Within the constructor, after importing required components, “this.” methods are used as desired to create dimension and background, to make it focusable enough

while running. Then essential components to run the game successfully, such as “KeyListener” is added and startGame(); method is called.

* From here, it’s all about creating methods to control and design the game fully now. Starting with “startGame” method, the appearance and location of the apple is controlled by the importation of Random. Boolean “running” is set to “true” along with the timer to start the game.

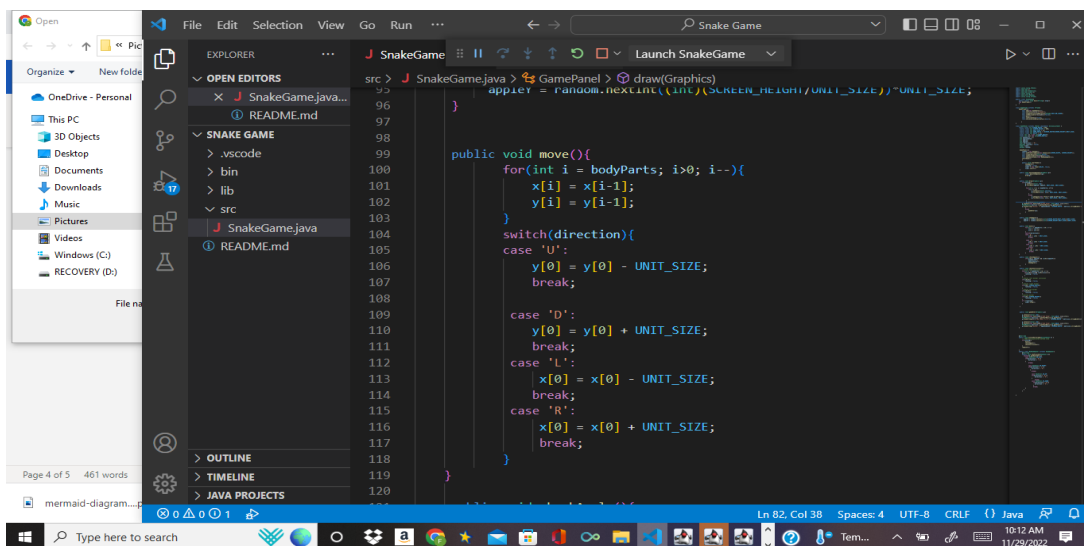


This screenshot shows the VS Code editor with the SnakeGame.java file open. The Explorer panel on the left shows the project structure with folders for .vscode, bin, lib, src, and README.md. The main editor window displays the startGame() method, which initializes a new Apple, sets the running flag to true, and starts a timer. The paintComponent(Graphics g) method is also visible, showing the call to draw(g).

```
src > SnakeGame.java > GamePanel > paintComponent(Graphics)
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```

*The draw and paintComponent methods set the visual of the objects (apple and snake). By set and fill methods, body parts and apples are colored as desired by using RGB values and coordinates are placed accordingly. RGB values of specific colors can be googled and used to your liking. The whole draw method is surrounded by if statement while running at constant speed, or else, it stops drawing when the game is over, and the statement is terminated.

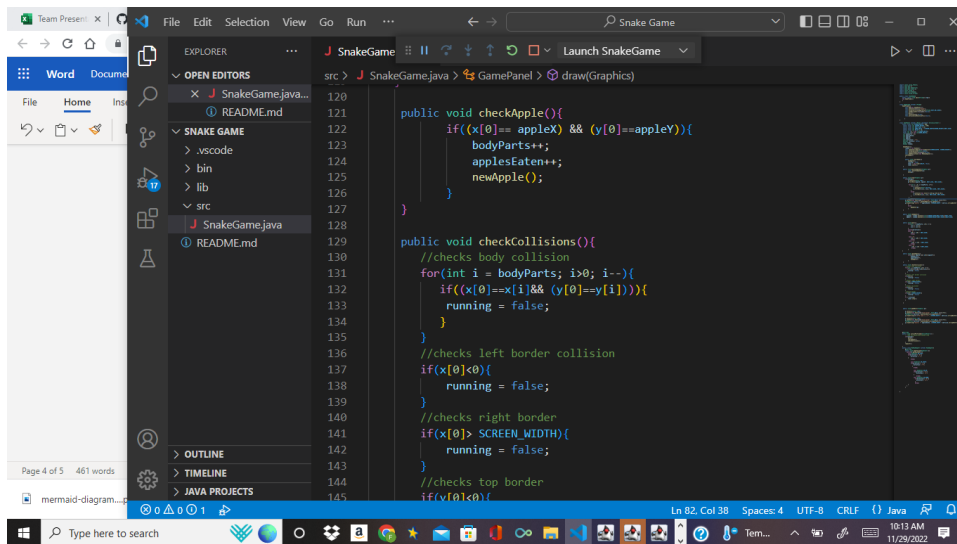
* The move method includes a for loop to iterate bodyparts through decrementing by one so that it keeps shifting one unit as the switch statements run by given direction as the user pleases. Array x and y are set according to the movements of their coordinates. Lastly, as methods are performed one by one in order, for the gameOver method, choose a string of texts as your liking by using the given codes below, here “Ew Noob!” is used with the display of earned score along with it when the game is over.



```
src > SnakeGame.java > GamePanel > draw(Graphics)
    applet = random.nextInt((int)(SCREEN_HEIGHT/UNIT_SIZE))-UNIT_SIZE;
}

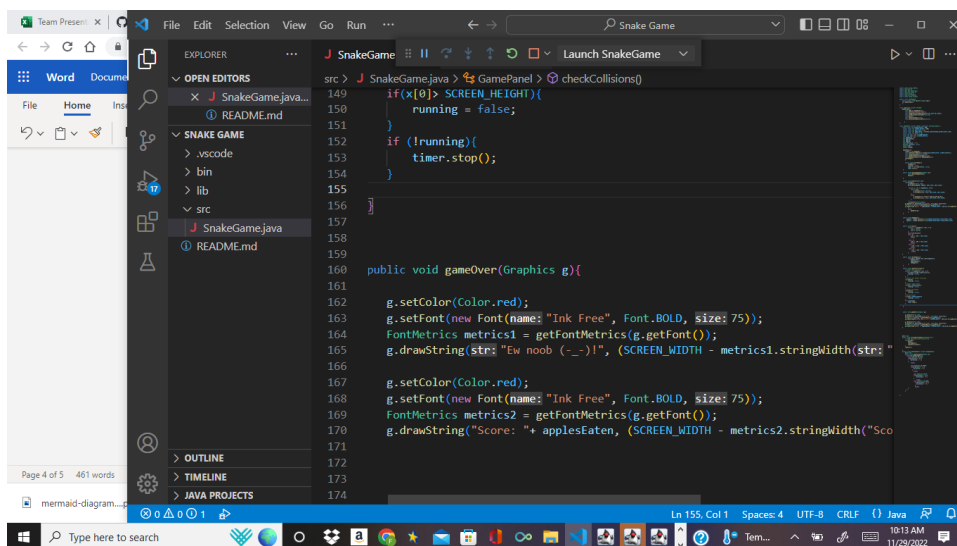
public void move(){
    for(int i = bodyParts; i>0; i--){
        x[i] = x[i-1];
        y[i] = y[i-1];
    }
    switch(direction){
        case 'U':
            y[0] = y[0] - UNIT_SIZE;
            break;

        case 'D':
            y[0] = y[0] + UNIT_SIZE;
            break;
        case 'L':
            x[0] = x[0] - UNIT_SIZE;
            break;
        case 'R':
            x[0] = x[0] + UNIT_SIZE;
            break;
    }
}
```



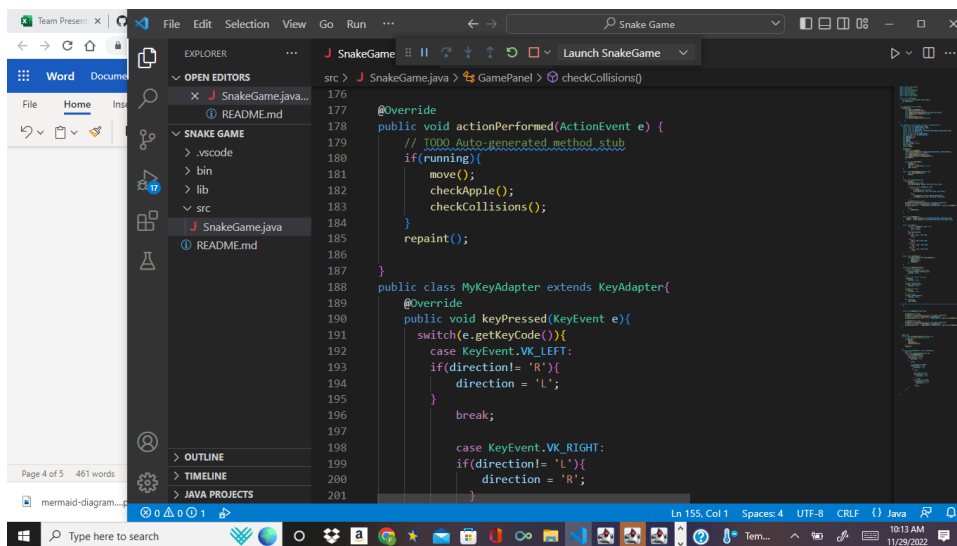
This screenshot shows the VS Code editor with the file SnakeGame.java open. The Explorer sidebar on the left shows the project structure with folders for .vscode, bin, lib, and src, and files for README.md and SnakeGame.java. The main editor area displays the code for the checkApple and checkCollisions methods. The checkApple method increments bodyParts and applesEaten when an apple is eaten. The checkCollisions method checks for body collisions and boundary collisions (left, right, top).

```
120
121
122 public void checkApple(){
123     if((x[0]== appleX) && (y[0]==appleY)){
124         bodyParts++;
125         applesEaten++;
126         newApple();
127     }
128 }
129
130 public void checkCollisions(){
131     //checks body collision
132     for(int i = bodyParts; i>0; i--){
133         if((x[0]==x[i]&& (y[0]==y[i]))){
134             running = false;
135         }
136     }
137     //checks left border collision
138     if(x[0]<0){
139         running = false;
140     }
141     //checks right border
142     if(x[0]> SCREEN_WIDTH){
143         running = false;
144     }
145     //checks top border
146     if(y[0]<0){
```



This screenshot shows the VS Code editor with the file SnakeGame.java open. The main editor area displays the code for the gameOver method, which sets the color to red, sets the font to "Ink Free", and draws the game over message. The checkCollisions method is also visible above it.

```
149
150 if(x[0]> SCREEN_HEIGHT){
151     running = false;
152 }
153 if (!running){
154     timer.stop();
155 }
156
157
158
159
160 public void gameOver(Graphics g){
161
162     g.setColor(Color.red);
163     g.setFont(new Font(name: "Ink Free", Font.BOLD, size: 75));
164     FontMetrics metrics1 = getFontMetrics(g.getFont());
165     g.drawString(str: "Ew noob (-_-)!", (SCREEN_WIDTH - metrics1.stringWidth(str: "
166
167     g.setColor(Color.red);
168     g.setFont(new Font(name: "Ink Free", Font.BOLD, size: 75));
169     FontMetrics metrics2 = getFontMetrics(g.getFont());
170     g.drawString("Score: "+ applesEaten, (SCREEN_WIDTH - metrics2.stringWidth("Sco
171
172
173
174
```



This screenshot shows the VS Code editor with the file SnakeGame.java open. The main editor area displays the code for the actionPerformed method and the MyKeyAdapter class. The actionPerformed method calls move, checkApple, checkCollisions, and repaint. The MyKeyAdapter class extends KeyAdapter and overrides keyPressed to handle left and right arrow keys.

```
176
177
178 @Override
179 public void actionPerformed(ActionEvent e) {
180     // 1000 Auto-generated method stub
181     if(running){
182         move();
183         checkApple();
184         checkCollisions();
185     }
186     repaint();
187 }
188
189 public class MyKeyAdapter extends KeyAdapter{
190     @Override
191     public void keyPressed(KeyEvent e){
192         switch(e.getKeyCode()){
193             case KeyEvent.VK_LEFT:
194                 if(direction!= 'R'){
195                     direction = 'L';
196                 }
197                 break;
198             case KeyEvent.VK_RIGHT:
199                 if(direction!= 'L'){
200                     direction = 'R';
201                 }
202             }
203         }
204     }
205 }
```

This screenshot shows the Visual Studio Code editor with the file `SnakeGame.java` open. The Explorer sidebar on the left shows the project structure with folders for `src`, `bin`, `lib`, and `src`. The `src` folder is expanded, showing `SnakeGame.java` and `README.md`. The main editor window displays the `SnakeGame.java` file, showing a `MyKeyAdapter` class that extends `KeyAdapter`. The `keyPressed` method uses a `switch` statement to handle key presses: `KeyEvent.VK_LEFT` sets `direction` to 'L', `KeyEvent.VK_RIGHT` sets it to 'R', `KeyEvent.VK_UP` sets it to 'U', and `KeyEvent.VK_DOWN` sets it to 'D'. The status bar at the bottom indicates the cursor is at line 155, column 1, with 4 spaces, UTF-8 encoding, and CRLF line endings.

```
public class MyKeyAdapter extends KeyAdapter{
    @Override
    public void keyPressed(KeyEvent e){
        switch(e.getKeyCode()){
            case KeyEvent.VK_LEFT:
                if(direction!= 'R'){
                    direction = 'L';
                }
                break;

            case KeyEvent.VK_RIGHT:
                if(direction!= 'L'){
                    direction = 'R';
                }
                break;

            case KeyEvent.VK_UP:
                if(direction!= 'D'){
                    direction = 'U';
                }
                break;
            case KeyEvent.VK_DOWN:
                if(direction!= 'U'){
                    direction = 'D';
                }
                break;
        }
    }
}
```

This screenshot shows the Visual Studio Code editor with the file `SnakeGame.java` open. The Explorer sidebar on the left shows the project structure with folders for `src`, `bin`, `lib`, and `src`. The `src` folder is expanded, showing `SnakeGame.java` and `README.md`. The main editor window displays the `SnakeGame.java` file, showing a `MyKeyAdapter` class that extends `KeyAdapter`. The `keyPressed` method uses an `if` statement to handle key presses: `KeyEvent.VK_LEFT` sets `direction` to 'L', `KeyEvent.VK_RIGHT` sets it to 'R', `KeyEvent.VK_UP` sets it to 'U', and `KeyEvent.VK_DOWN` sets it to 'D'. The status bar at the bottom indicates the cursor is at line 155, column 1, with 4 spaces, UTF-8 encoding, and CRLF line endings.

```
if(direction!= 'R'){
    direction = 'L';
}
break;

case KeyEvent.VK_RIGHT:
    if(direction!= 'L'){
        direction = 'R';
    }
    break;

case KeyEvent.VK_UP:
    if(direction!= 'D'){
        direction = 'U';
    }
    break;
case KeyEvent.VK_DOWN:
    if(direction!= 'U'){
        direction = 'D';
    }
    break;
}
```