

ME

JavaFX Can you write a JavaFX Program which displays 4rows a 20 characters using a particular font?

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Here is a simple JavaFX program that displays 4 rows of 20 characters each using a particular font.

JavaFX Code Sample

```
import javafx.application.Application;
import javafx.scene.Scene;
import javafx.scene.layout.VBox;
import javafx.scene.text.Font;
import javafx.scene.text.Text;
import javafx.stage.Stage;

public class TextDisplayApp extends Application {

    @Override
    public void start(Stage primaryStage) {
        // Define your font - use a known one or load a custom one
        Font customFont = Font.font("Courier New", 20); // Monospaced is good for alignment

        // Create 4 rows of 20 characters each
        Text row1 = new Text("Row 1: ABCDEFGHIJKLMNOP");
        Text row2 = new Text("Row 2: 1234567890123456");
        Text row3 = new Text("Row 3: !@#$%^&*()_+[]{}");
        Text row4 = new Text("Row 4: JavaFX Text Row!");

        // Apply font to all rows
        row1.setFont(customFont);
        row2.setFont(customFont);
        row3.setFont(customFont);
        row4.setFont(customFont);

        // Arrange in a VBox
        VBox vbox = new VBox(10, row1, row2, row3, row4);

        // Set up scene and stage
        Scene scene = new Scene(vbox, 500, 200);
        primaryStage.setTitle("JavaFX Text Display");
        primaryStage.setScene(scene);
        primaryStage.show();
    }

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

Notes:

- **Font:** You can replace "Courier New" with any installed font or load a .ttf file with `Font.loadFont(...)`.
- **Text alignment:** Monospaced fonts like Courier New ensure 20 characters line up visually.
- **Styling:** You can enhance appearance with padding, borders, or background using `VBox.setStyle(...)`.

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create a component so we can reuse it do keep 4 components in a row

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To make the layout reusable, we can create a JavaFX custom component class (e.g. **FourRowTextPane**) that encapsulates the behavior of displaying 4 rows with 20 characters each. You can then reuse this component multiple times in any JavaFX application.

✓ Goal:

- Create a **reusable JavaFX component**
- It displays **4 text rows**, each with **20 characters**
- Uses a **custom font**
- Can be reused/instantiated multiple times

Step 1: Create the Component Class

```
import javafx.scene.layout.VBox;
import javafx.scene.text.Font;
import javafx.scene.text.Text;

public class FourRowTextPane extends VBox {

    private final Text row1 = new Text();
    private final Text row2 = new Text();
    private final Text row3 = new Text();
    private final Text row4 = new Text();

    public FourRowTextPane(String line1, String line2, String line3, String line4, Font font)
    {
        super(10); // spacing between lines
        setPrefWidth(400);

        // Set texts and font
        row1.setText(padOrTrim(line1));
        row2.setText(padOrTrim(line2));
        row3.setText(padOrTrim(line3));
        row4.setText(padOrTrim(line4));

        row1.setFont(font);
        row2.setFont(font);
        row3.setFont(font);
        row4.setFont(font);

        getChildren().addAll(row1, row2, row3, row4);
    }

    // Pads or trims to ensure 20 characters
    private String padOrTrim(String input) {
        if (input.length() < 20) {
            return String.format("%-20s", input); // pad right with spaces
        }
        return input.substring(0, 20); // trim if too long
    }
}
```

📌 Step 2: Use the Component in Your Application

```
import javafx.application.Application;
import javafx.scene.Scene;
import javafx.scene.layout.HBox;
import javafx.scene.text.Font;
import javafx.stage.Stage;

public class ReusableComponentDemo extends Application {

    @Override
    public void start(Stage primaryStage) {
        Font customFont = Font.font("Courier New", 16);

        FourRowTextPane pane1 = new FourRowTextPane(
            "Pane1: Line 1", "Pane1: Line 2", "Pane1: Line 3", "Pane1: Line 4", customFont
        );

        FourRowTextPane pane2 = new FourRowTextPane(
            "Another 1", "Another 2", "Another 3", "Another 4", customFont
        );

        FourRowTextPane pane3 = new FourRowTextPane(
            "Row 1", "Row 2", "Row 3", "Row 4", customFont
        );

        FourRowTextPane pane4 = new FourRowTextPane(
            "Final 1", "Final 2", "Final 3", "Final 4", customFont
        );

        HBox hbox = new HBox(20, pane1, pane2, pane3, pane4); // 4 in a row

        Scene scene = new Scene(hbox, 1000, 300);
        primaryStage.setTitle("FourRowTextPane Demo");
        primaryStage.setScene(scene);
        primaryStage.show();
    }

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



Advantages

- **Encapsulation:** Logic and formatting are encapsulated in one class.
- **Reusability:** Instantiate multiple panes with different content.
- **Scalability:** Easy to add borders, background, or interactivity per pane.

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Set color to light blue background and white foreground

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To set a light blue background and white foreground (text) for each `FourRowTextPane`, you can apply CSS styles using JavaFX's `setStyle(...)` method or external `.css` files.

Here's how to update your component **directly in Java code**.

Updated `FourRowTextPane` with Colors

```
import javafx.scene.layout.VBox;
import javafx.scene.text.Font;
import javafx.scene.text.Text;
import javafx.scene.paint.Color;

public class FourRowTextPane extends VBox {

    private final Text row1 = new Text();
    private final Text row2 = new Text();
    private final Text row3 = new Text();
    private final Text row4 = new Text();

    public FourRowTextPane(String line1, String line2, String line3, String line4, Font font)
    {
        super(10); // spacing

        // Set preferred size (optional)
        setPrefWidth(200);
        setStyle("-fx-background-color: lightblue; -fx-padding: 10px;");

        // Set content and apply styles
        row1.setText(padOrTrim(line1));
        row2.setText(padOrTrim(line2));
        row3.setText(padOrTrim(line3));
        row4.setText(padOrTrim(line4));

        row1.setFont(font);
        row2.setFont(font);
        row3.setFont(font);
        row4.setFont(font);

        row1.setFill(Color.WHITE);
        row2.setFill(Color.WHITE);
        row3.setFill(Color.WHITE);
        row4.setFill(Color.WHITE);

        getChildren().addAll(row1, row2, row3, row4);
    }

    private String padOrTrim(String input) {
        if (input.length() < 20) {
            return String.format("%-20s", input);
        }
        return input.substring(0, 20);
    }
}
```

Result

Each component will now:

- Have a **light blue background**
- Display **white text**
- Keep a spacing of 10px between rows
- Be easy to reuse in a row or grid layout

Would you like me to refactor this to use a **CSS file** instead of inline styles?

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instead of constructor parameter add two functions to our component: `clear()` --> clears all data
`setPosition(col, row)` --> sets the cursor internally `write(String)` --> writes chars based on cursor position.
do not write outside the frame of 20 chars or 4 rows

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Here is the refactored **FourRowTextPane** component based on your new requirements:



Features Implemented

- `clear()`: Resets all text to blanks.
- `setPosition(int col, int row)`: Sets an internal cursor position (0-based).
- `write(String text)`: Writes starting from the cursor, line by line, without overflowing the 4×20 boundary.
- Keeps a visual layout with **light blue background** and **white text**.



Full Updated Component Code

```
import javafx.scene.layout.VBox;
import javafx.scene.paint.Color;
import javafx.scene.text.Font;
import javafx.scene.text.Text;

public class FourRowTextPane extends VBox {

    private static final int ROWS = 4;
    private static final int COLS = 20;

    private final Text[] textRows = new Text[ROWS];
    private final StringBuilder[] rowData = new StringBuilder[ROWS];

    private int cursorRow = 0;
    private int cursorCol = 0;

    public FourRowTextPane(Font font) {
        super(10); // spacing between lines

        setPrefWidth(300);
        setStyle("-fx-background-color: lightblue; -fx-padding: 10px; -fx-border-radius: 10px; -fx-background-radius: 10px;");

        for (int i = 0; i < ROWS; i++) {
            textRows[i] = new Text(" ".repeat(COLS));
            textRows[i].setFont(font);
            textRows[i].setFill(Color.WHITE);
            getChildren().add(textRows[i]);

            rowData[i] = new StringBuilder(" ".repeat(COLS));
        }

        // Clears all rows and resets cursor
        public void clear() {
            for (int i = 0; i < ROWS; i++) {
                rowData[i] = new StringBuilder(" ".repeat(COLS));
            }
        }
    }
}
```

```

        textRows[i].setText(rowData[i].toString());
    }
    cursorRow = 0;
    cursorCol = 0;
}

// Sets internal cursor (0-based)
public void setPosition(int col, int row) {
    if (row >= 0 && row < ROWS && col >= 0 && col < COLS) {
        cursorRow = row;
        cursorCol = col;
    }
}

// Writes string at current cursor without overflowing the frame
public void write(String text) {
    int r = cursorRow;
    int c = cursorCol;

    for (char ch : text.toCharArray()) {
        if (r >= ROWS) break;

        if (c < COLS) {
            rowData[r].setCharAt(c, ch);
            c++;
        } else {
            // Move to next line
            r++;
            if (r >= ROWS) break;
            c = 0;
            rowData[r].setCharAt(c, ch);
            c++;
        }
    }

    // Update display
    for (int i = 0; i < ROWS; i++) {
        textRows[i].setText(rowData[i].toString());
    }

    // Update cursor
    cursorRow = r;
    cursorCol = c;
}
}

```



Sample Usage

In your main app:

```

Font font = Font.font("Courier New", 16);
FourRowTextPane pane = new FourRowTextPane(font);

pane.setPosition(5, 1);
pane.write("Hello JavaFX world!");

```



Notes

- Cursor will wrap lines but will not write beyond row 3 (4th row).
- You can add logic to wrap text, scroll, or make the component editable if needed.
- `rowData` keeps the internal text state cleanly separated.

Would you like me to add a blinking cursor effect or make the component accept keyboard input?

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Introduce a interface for the component, so we can create different implementations (like a real LCD display)

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To support multiple implementations (e.g., for real LCD simulation, emulators, or hardware backends), we can introduce a Java interface that defines a standard contract for any "LCD-like" display with cursor-controlled text writing.

Design Goals

- Introduce an `LCDDisplay` interface
- Allow multiple interchangeable implementations (e.g., `JavaFXLCDDisplay`, `RealLCDDisplay`)
- Decouple logic from UI toolkit (JavaFX vs hardware)

Step 1: Create the `LCDDisplay` Interface

```
public interface LCDDisplay {  
    void clear();  
    void setPosition(int col, int row);  
    void write(String text);  
}
```

This is simple but expressive. It defines:

- `clear()`: clears display contents
- `setPosition(col, row)`: sets the write position
- `write(text)`: writes from the cursor without overflow

Step 2: Update FourRowTextPane to Implement LCDDisplay

Rename it to make the naming consistent, e.g., JavaFXLCDDisplay:

```
import javafx.scene.layout.VBox;
import javafx.scene.paint.Color;
import javafx.scene.text.Font;
import javafx.scene.text.Text;

public class JavaFXLCDDisplay extends VBox implements LCDDisplay {

    private static final int ROWS = 4;
    private static final int COLS = 20;

    private final Text[] textRows = new Text[ROWS];
    private final StringBuilder[] rowData = new StringBuilder[ROWS];

    private int cursorRow = 0;
    private int cursorCol = 0;

    public JavaFXLCDDisplay(Font font) {
        super(10);

        setPrefWidth(300);
        setStyle("-fx-background-color: lightblue; -fx-padding: 10px; -fx-border-radius: 10px; -fx-background-radius: 10px;");

        for (int i = 0; i < ROWS; i++) {
            textRows[i] = new Text(" ".repeat(COLS));
            textRows[i].setFont(font);
            textRows[i].setFill(Color.WHITE);
            getChildren().add(textRows[i]);

            rowData[i] = new StringBuilder(" ".repeat(COLS));
        }

        @Override
        public void clear() {
            for (int i = 0; i < ROWS; i++) {
                rowData[i] = new StringBuilder(" ".repeat(COLS));
                textRows[i].setText(rowData[i].toString());
            }
            cursorRow = 0;
            cursorCol = 0;
        }

        @Override
        public void setPosition(int col, int row) {
            if (row >= 0 && row < ROWS && col >= 0 && col < COLS) {
                cursorRow = row;
                cursorCol = col;
            }
        }

        @Override
        public void write(String text) {
            int r = cursorRow;
            int c = cursorCol;

            for (char ch : text.toCharArray()) {
                if (r >= ROWS) break;

                if (c < COLS) {
                    rowData[r].setCharAt(c, ch);
                    c++;
                } else {
                    r++;
                    if (r >= ROWS) break;
                }
            }
        }
    }
}
```

```

        c = 0;
        rowData[r].setCharAt(c, ch);
        c++;
    }
}

for (int i = 0; i < ROWS; i++) {
    textRows[i].setText(rowData[i].toString());
}

cursorRow = r;
cursorCol = c;
}
}

```

Step 3: Use the Interface in Main Code

Now your application can remain **agnostic** of the implementation:

```

LCDDisplay display = new JavaFXLCDDisplay(Font.font("Courier New", 16));
display.setPosition(3, 0);
display.write("Interface-based LCD");

```

Later you can swap in:

```

LCDDisplay display = new RealLCDDisplay(); // e.g., connected via serial

```

Optional: Add More Interface Methods

If needed, you could expand the LCDDisplay interface to support:

```

void setChar(int col, int row, char c);
char getChar(int col, int row);
String[] getBuffer(); // for tests/debug

```

Would you like me to implement a **mock LCD renderer** (e.g., console-based for unit testing) or simulate **character matrix rendering** (e.g., 5x7 dots per character)?

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please create a maven pom, java 21

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Here's a full `pom.xml` file for a JavaFX project using Java 21 and Maven, designed to support the `JavaFXLCDDisplay` and `LCDDisplay` interface you're building.

✓ Features Included

- Java 21 compatibility
- JavaFX modules via `org.openjfx`
- Maven compiler settings
- `javafx-controls` (for UI)
- Profile for cross-platform execution (win, mac, linux)



`pom.xml`

```
<project xmlns="http://maven.apache.org/POM/4.0.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
    http://maven.apache.org/xsd/maven-4.0.0.xsd">

  <modelVersion>4.0.0</modelVersion>
  <groupId>com.example</groupId>
  <artifactId>lcd-display</artifactId>
  <version>1.0-SNAPSHOT</version>

  <properties>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    <maven.compiler.source>21</maven.compiler.source>
    <maven.compiler.target>21</maven.compiler.target>
    <javafx.version>21</javafx.version>
  </properties>

  <dependencies>
    <!-- JavaFX modules -->
    <dependency>
      <groupId>org.openjfx</groupId>
      <artifactId>javafx-controls</artifactId>
      <version>${javafx.version}</version>
    </dependency>
    <dependency>
      <groupId>org.openjfx</groupId>
      <artifactId>javafx-graphics</artifactId>
      <version>${javafx.version}</version>
    </dependency>
  </dependencies>

  <build>
    <plugins>
      <!-- Maven Compiler -->
      <plugin>
        <artifactId>maven-compiler-plugin</artifactId>
        <version>3.11.0</version>
        <configuration>
```

```

        <release>21</release>
      </configuration>
    </plugin>

    <!-- JavaFX Maven Plugin -->
    <plugin>
      <groupId>org.openjfx</groupId>
      <artifactId>javafx-maven-plugin</artifactId>
      <version>0.0.8</version>
      <executions>
        <execution>
          <goals>
            <goal>run</goal>
          </goals>
        </execution>
      </executions>
      <configuration>
        <mainClass>com.example.Main</mainClass>
      </configuration>
    </plugin>
  </plugins>
</build>
</project>

```

Project Structure Suggestion

```

css
KopierenBearbeiten
src/
├── main/
│   └── java/
│       └── com/
│           └── example/
│               ├── Main.java
│               ├── LCDDisplay.java
│               └── JavaFXLCDDisplay.java

```

Make sure your main class (e.g. `Main.java`) is in the `com.example` package and contains a `public static void main(...)` or extends `Application`.

Would you like me to generate the full `Main.java` as a test driver for your `JavaFXLCDDisplay` implementation?

Du:

yes

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Here is a complete and ready-to-run `Main.java` class to test your `JavaFXLCDDisplay` implementation via the `LCDDisplay` interface.

Features of This Example

- Uses `JavaFXLCDDisplay` via the `LCDDisplay` interface
- Demonstrates use of `setPosition()`, `write()`, and `clear()`

- Styled with monospaced font and light blue background
- Compatible with the Maven pom.xml I gave earlier



Main.java (in com.example package)

```
package com.example;

import javafx.application.Application;
import javafx.scene.Scene;
import javafx.scene.text.Font;
import javafx.stage.Stage;

public class Main extends Application {

    @Override
    public void start(Stage primaryStage) {
        // Use monospaced font for alignment
        Font lcdFont = Font.font("Courier New", 16);

        // Use the interface for flexibility
        LCDDisplay display = new JavaFXLCDDisplay(lcdFont);

        // Test usage
        display.setPosition(0, 0);
        display.write("Hello World");

        display.setPosition(5, 1);
        display.write("LCD via interface");

        display.setPosition(0, 3);
        display.write("Line 4 starts here");

        // Set up and show JavaFX scene
        Scene scene = new Scene((JavaFXLCDDisplay) display, 500, 200);
        primaryStage.setTitle("LCD Display Demo");
        primaryStage.setScene(scene);
        primaryStage.show();
    }

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



Package Structure Recap

Ensure the files are located like this:

```
css
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src/
├── main/
│   ├── java/
│   │   ├── com/
│   │   │   └── example/
│   │   │       ├── Main.java
│   │   │       ├── LCDDisplay.java
│   │   │       └── JavaFXLCDDisplay.java
```

Run Instructions

To launch the app with Maven:

```
bash
mvn javafx:run
```

This will open a window with your styled 4x20 LCD simulation showing test output.

Would you like help creating a mock or headless implementation of LCDDisplay for unit testing or command-line use?

ME

please create ready to use project as ZIP

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✅ **Your complete JavaFX LCD Display Maven project (Java 21) is ready.**

You can download it here:
👉 **lcd-display-project.zip**

Contents include:

- pom.xml (JavaFX + Java 21 config)
- LCDDisplay.java (interface)
- JavaFXLCDDisplay.java (component implementation)
- Main.java (launchable JavaFX app)

To run:

```
bash
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mvn javafx:run
```

Let me know if you want a unit test setup or mock implementation!

ChatGPT kann Fehler machen.