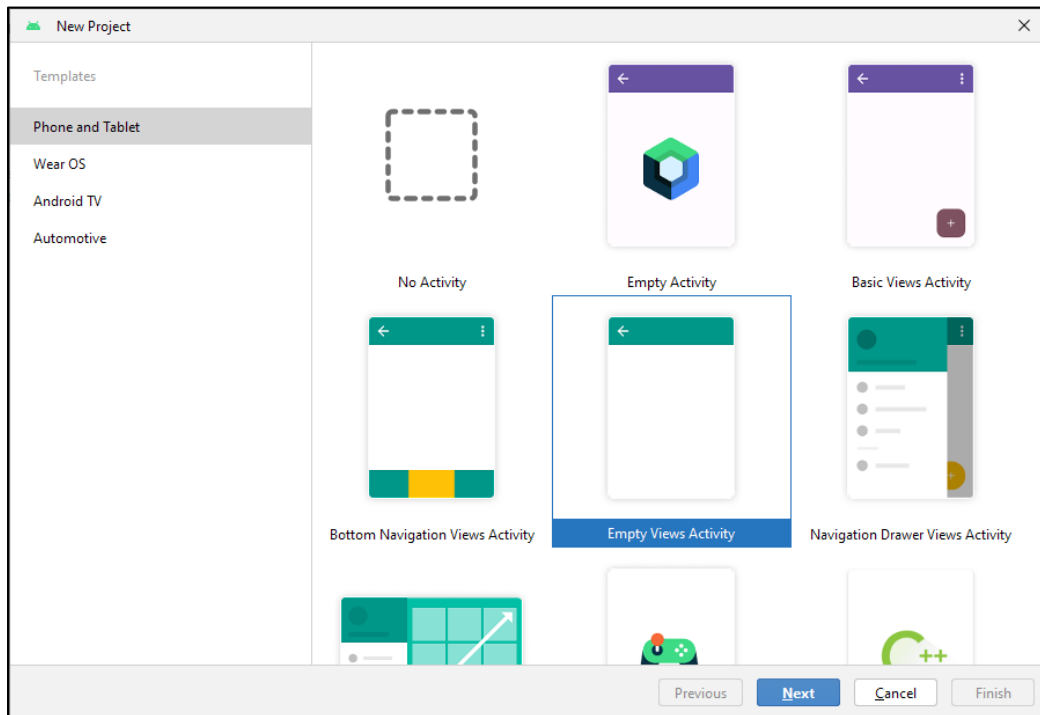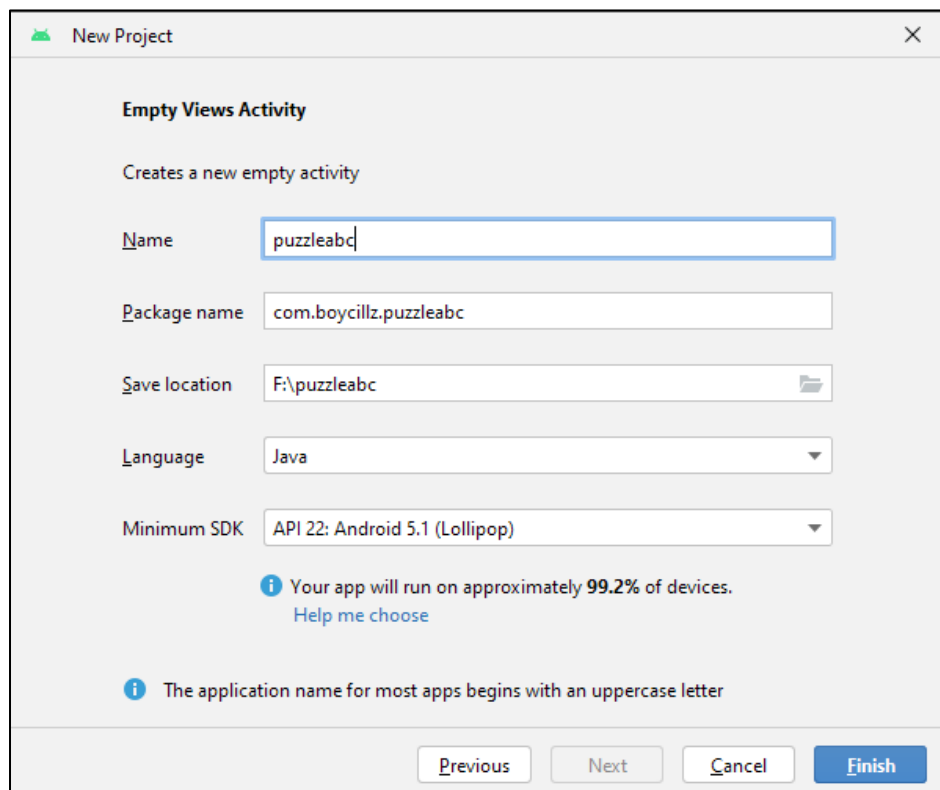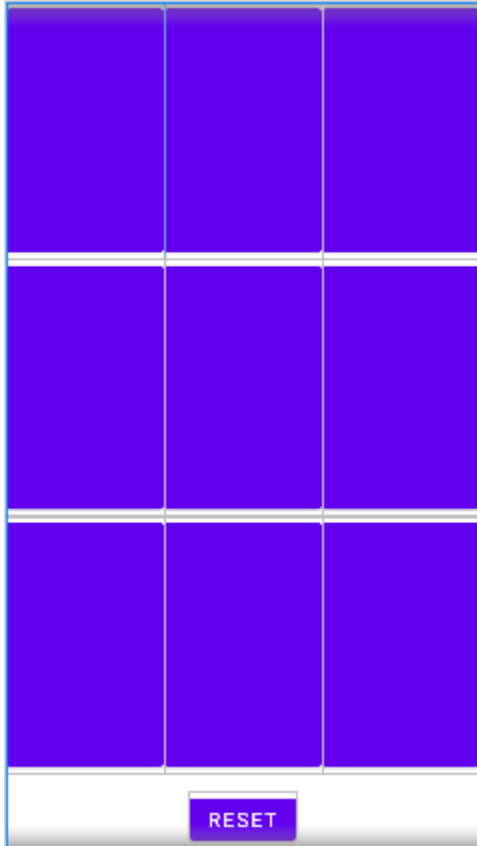# Aplikasi Game ABC

1. Buatlah sebuah proyek baru pada android studio, dan berikan nama pada proyek yang akan anda buat
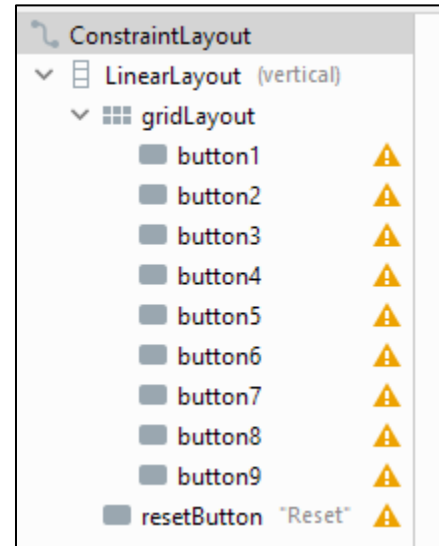

2. Tuliskan nama puzzleabc dan package

3. Desainlah sebuah tampilan pada activity_main.xml

Struktur layout komponen nya..

4. Sesuaikan kode xml pada activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">

        <GridLayout
            android:id="@+id/gridLayout"
            android:layout_width="match_parent"
            android:layout_height="0dp"
            android:layout_weight="1"
            android:columnCount="3"
            android:rowCount="3">
```

```xml
<Button
    android:id="@+id/button1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_rowWeight="1"
    android:layout_columnWeight="1"
    android:contentDescription="@string/button1"
    android:textSize="24sp"
    android:textStyle="bold" />

<Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_rowWeight="1"
    android:layout_columnWeight="1"
    android:contentDescription="@string/button2"
    android:textSize="24sp"
    android:textStyle="bold" />
```

```xml
<Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_rowWeight="1"
    android:layout_columnWeight="1"
    android:contentDescription="@string/button3"
    android:textSize="24sp"
    android:textStyle="bold" />

<Button
    android:id="@+id/button4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_rowWeight="1"
    android:layout_columnWeight="1"
    android:contentDescription="@string/button4"
    android:textSize="24sp"
    android:textStyle="bold" />
```

```xml
<Button
    android:id="@+id/button5"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_rowWeight="1"
    android:layout_columnWeight="1"
    android:contentDescription="@string/button5"
    android:textSize="24sp"
    android:textStyle="bold" />

<Button
    android:id="@+id/button6"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_rowWeight="1"
    android:layout_columnWeight="1"
    android:contentDescription="@string/button6"
    android:textSize="24sp"
    android:textStyle="bold" />
```

```xml
<Button
    android:id="@+id/button7"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_rowWeight="1"
    android:layout_columnWeight="1"
    android:contentDescription="@string/button7"
    android:textSize="24sp"
    android:textStyle="bold" />

<Button
    android:id="@+id/button8"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_rowWeight="1"
    android:layout_columnWeight="1"
    android:contentDescription="@string/button8"
    android:textSize="24sp"
    android:textStyle="bold" />
```

```xml
            <Button
                android:id="@+id/button9"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_rowWeight="1"
                android:layout_columnWeight="1"
                android:contentDescription="@string/button9"
                android:textSize="24sp"
                android:textStyle="bold" />

        </GridLayout>
        <Button
            android:id="@+id/resetButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="center"
            android:layout_marginTop="16dp"
            android:text="@string/reset"
            android:textSize="18sp" />
    </LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

5. Pada kelas Java MainActivity.java, tambahkan kode berikut:

```java
1    package com.boycillz.puzzleabc;
2
3    import androidx.appcompat.app.AppCompatActivity;
4
5    import android.os.Bundle;
6    import android.view.View;
7    import android.widget.Button;
8    import android.widget.Toast;
9
10   import java.util.Arrays;
11   import java.util.Collections;
12   import java.util.List;
13
     2 usages
14   public class MainActivity extends AppCompatActivity
15           implements View.OnClickListener {
```

```java
17           private Button[][] buttons = new Button[3][3];
             5 usages
18           private String[][] buttonValues = new String[3][3];
             2 usages
19           private Button resetButton;
             6 usages
20           private int emptyRow, emptyCol;
21
22           @Override
23           protected void onCreate(Bundle savedInstanceState) {
24               super.onCreate(savedInstanceState);
25               setContentView(R.layout.activity_main);
26
27               initializeButtons();
28               shuffleButtons();
```

```java
29
30            resetButton = findViewById(R.id.resetButton);
31            resetButton.setOnClickListener(new View.OnClickListener() {
32                @Override
33 ●↑          public void onClick(View v) { shuffleButtons(); }
36            });
37        }
       1 usage
38    private void initializeButtons() {
39        buttons[0][0] = findViewById(R.id.button1);
40        buttons[0][1] = findViewById(R.id.button2);
41        buttons[0][2] = findViewById(R.id.button3);
42        buttons[1][0] = findViewById(R.id.button4);
43        buttons[1][1] = findViewById(R.id.button5);
44        buttons[1][2] = findViewById(R.id.button6);
45        buttons[2][0] = findViewById(R.id.button7);
46        buttons[2][1] = findViewById(R.id.button8);
47        buttons[2][2] = findViewById(R.id.button9);
49        for (int row = 0; row < 3; row++) {
50            for (int col = 0; col < 3; col++) {
51                buttons[row][col].setOnClickListener(this);
52            }
53        }
54    }
       2 usages
55    private void shuffleButtons() {
56        List<String> letters = Arrays.asList("A", "B", "C",
57                "D", "E", "F", "G", "H", "");
58        Collections.shuffle(letters);
59
60        int index = 0;
61
62        for (int row = 0; row < 3; row++) {
63            for (int col = 0; col < 3; col++) {
64                buttons[row][col].setText(letters.get(index));
```

```java
65                 buttonValues[row][col] = letters.get(index);
66                 if (letters.get(index).equals("")) {
67                     emptyRow = row;
68                     emptyCol = col;
69                 }
70                 index++;
71             }
72         }
73     }
   1 usage
74     private boolean isValidMove(int row, int col) {
75         return (row == emptyRow && Math.abs(col - emptyCol) == 1) ||
76                (col == emptyCol && Math.abs(row - emptyRow) == 1);
77     }
```

```java
78     private void swapButtons(int row, int col) {
79         Button clickedButton = buttons[row][col];
80         Button emptyButton = buttons[emptyRow][emptyCol];
81
82         emptyButton.setText(clickedButton.getText());
83         clickedButton.setText("");
84
85         buttonValues[emptyRow][emptyCol] = buttonValues[row][col];
86         buttonValues[row][col] = "";
87
88         emptyRow = row;
89         emptyCol = col;
90     }
```

```java
91      private boolean isSolved() {
92          int index = 1;
93          for (int row = 0; row < 3; row++) {
94              for (int col = 0; col < 3; col++) {
95                  if (row == 2 && col == 2) {
96                      break;
97                  }
98                  if (!buttonValues[row][col].equals(String.valueOf(index))) {
99                      return false;
100                 }
101                 index++;
102             }
103         }
104         return true;
105     }
```

```java
108     public void onClick(View v) {
109         for (int row = 0; row < 3; row++) {
110             for (int col = 0; col < 3; col++) {
111                 if (v == buttons[row][col]) {
112                     if (isValidMove(row, col)) {
113                         swapButtons(row, col);
114
115                         if (isSolved()) {
116                             Toast.makeText( context: this,  text: "Puzzle Solved!",
117                                     Toast.LENGTH_SHORT).show();
118                         }
119                     }
120                     return;
121                 }
122             }
123         }
124     }
125 }
```
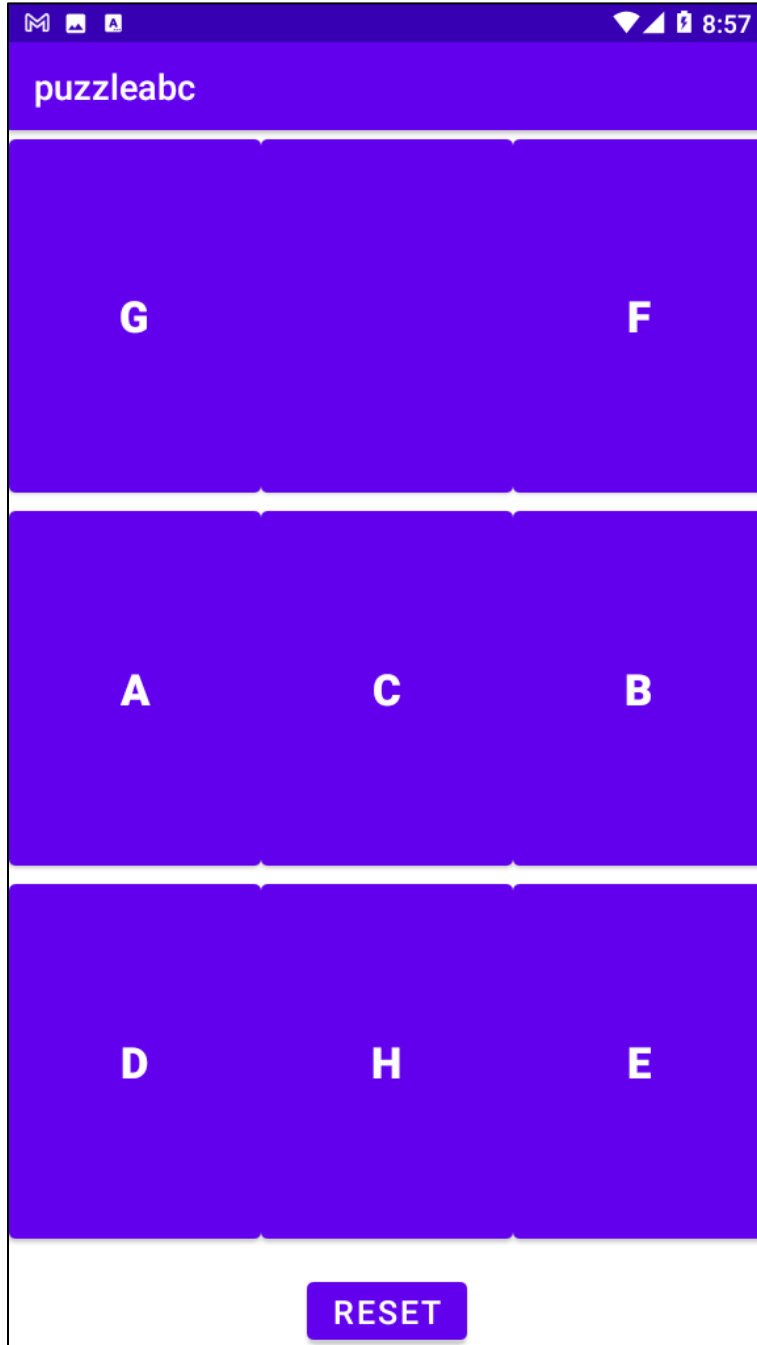
1. Jalankan aplikasi tersebut, lalu ujilah

Tampilan awal aplikasi kalkulator
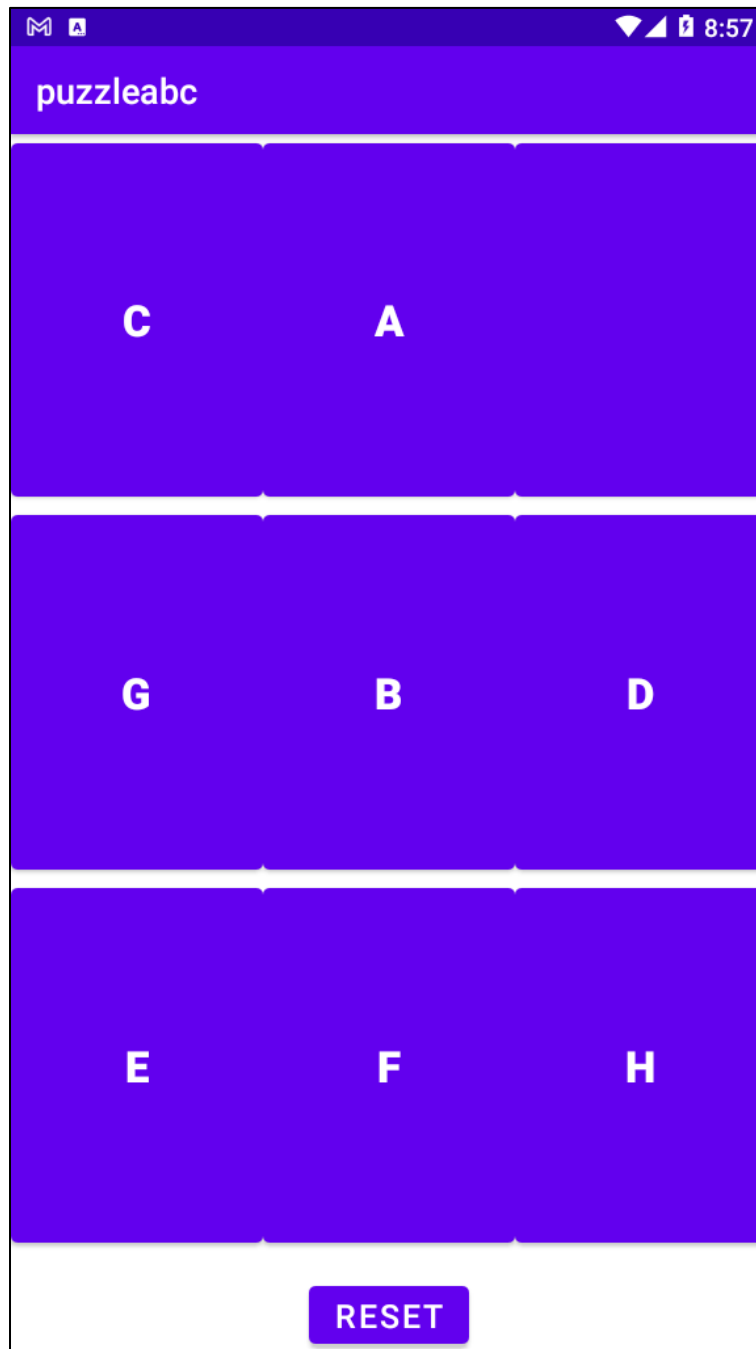
Ketika aplikasi dijalankan, hurufnya berpindah

Ketika melakukan menekan tombol reset di aplikasi