Exercise 2 - Keyboard application

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Aim

To implement a keyboard application using Android Studio

Code

activity_main.xml

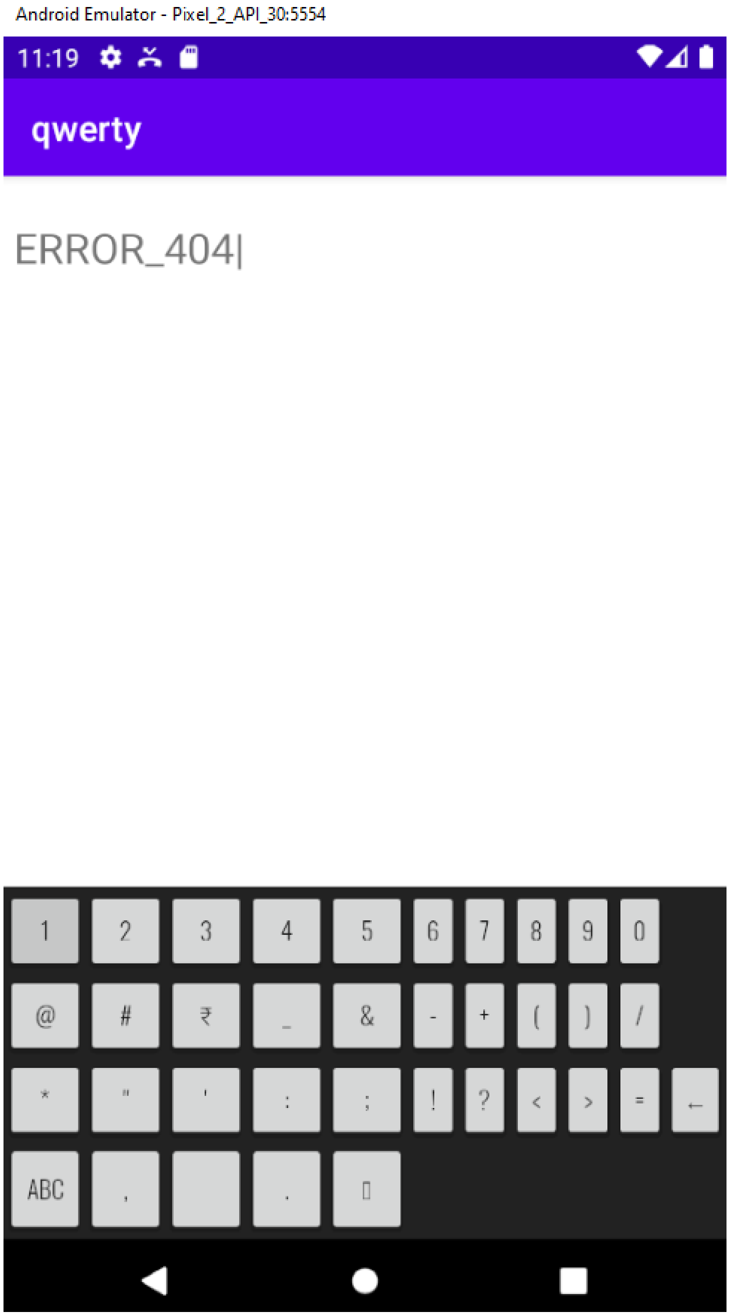
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:orientation="vertical"
  tools:context=".MainActivity">

  <TextView
     android:id="@+id/text_bar"
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:layout_marginLeft="6dp"
     android:layout_marginTop="24dp"
     android:layout_marginRight="6dp"
     android:hint="Enter text..."
     android:text=""
     android:textSize="24sp" />

  <GridLayout
     android:id="@+id/keyboard"
```

```
        android:layout_width="match_parent"
        android:layout_height="200dp"
        android:layout_alignParentBottom="true"
        android:background="#202020"
        android:padding="1dp" />
</RelativeLayout>
```

MainActivity.java

```
package com.example.qwerty;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.content.res.ResourcesCompat;
import android.os.Bundle;
import android.util.DisplayMetrics;
import android.view.Gravity;
import android.widget.Button;
import android.widget.GridLayout;
import android.widget.TextView;
import android.graphics.Typeface;

public class MainActivity extends AppCompatActivity {
   private final String[][] letterKeys = {
           {"Q", "W", "E", "R", "T", "Y", "U", "I", "O", "P"},
           {"A", "S", "D", "F", "G", "H", "J", "K", "L"},
           {"↑", "Z", "X", "C", "V", "B", "N", "M", "←"},
           {"?123", ",", " ", ".", "□"}
   };
   private final String[][] numberKeys = {
           {"1", "2", "3", "4", "5", "6", "7", "8", "9", "0"},
           {"@", "#", "₹", "_", "&", "-", "+", "(", ")", "/"},
           {"*", "\"", "'", ":", ";", "!", "?", "<", ">", "=", "←"},
           {"ABC", ",", " ", ".", "□"}
   };
   private TextView textBar;

   private GridLayout keyboard;
   private DisplayMetrics displayMetrics;
   private Boolean isCaps = false;
   private Typeface customFont;
private void init() {
    textBar = findViewById(R.id.text_bar);
    textBar.setText("|");
    keyboard = findViewById(R.id.keyboard);

    displayMetrics = new DisplayMetrics();
    getWindowManager().getDefaultDisplay().getMetrics(displayMetrics);

    customFont = ResourcesCompat.getFont(this, R.font.oswald);
}
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    init();
    initKeyboard(letterKeys);
}

private void initKeyboard(String[][] keys) {
    keyboard.removeAllViews();

    int rowIndex = 0;
    for (String[] row : keys) {
        int colIndex = 0;
        int width = displayMetrics.widthPixels / (row.length + 4);

        for (String letter : row) {
            addButtonToKeyboard(letter, width, rowIndex, colIndex);
            colIndex++;
        }
        rowIndex++;
    }
}

private boolean isChar(String key) {
    return key.length() == 1 && Character.isLetter(key.charAt(0));
}

private void addButtonToKeyboard(String key, int width, int row, int col) {
    Button button = new Button(this);
    if (isChar(key)) button.setText(key.toLowerCase());
    else {
        button.setText(key);
        button.setTypeface(customFont);
        button.setWidth(0);
        button.setPadding(0, 0, 0, 0);
    }

    GridLayout.LayoutParams params = new GridLayout.LayoutParams();
    params.width = width;
    params.height = GridLayout.LayoutParams.WRAP_CONTENT;
    params.rowSpec = GridLayout.spec(row);
    params.columnSpec = GridLayout.spec(col);
    params.setGravity(Gravity.FILL);

    button.setLayoutParams(params);
    button.setClickable(true);
    setHandler(button, key);

    keyboard.addView(button);
}

private void setHandler(Button button, String key) {
    if (key.length() == 1 && Character.isLetter(key.charAt(0))) {
        button.setOnClickListener(view -> {
            if (isCaps) textBar.append(key.toUpperCase());
            else textBar.append(key.toLowerCase());
        });
        return;
    }

    switch (key) {
        case "↑":
            button.setOnClickListener(view -> isCaps = !isCaps);
            break;
        case "←":
            button.setOnClickListener(view -> {
                CharSequence currentText = textBar.getText();
                if(currentText.length()!=0) {
                    CharSequence newText = currentText.subSequence(0, currentText.length() - 1);
                    textBar.setText(newText);
                }
        });
        break;
      case "?123":
        button.setOnClickListener(view -> initKeyboard(numberKeys));
        break;
      case "ABC":
        button.setOnClickListener(view -> initKeyboard(letterKeys));
        break;
      case "□":
        button.setOnClickListener(view -> textBar.append("\n"));
        break;
      default:
        button.setOnClickListener(view -> {
            CharSequence currentText = textBar.getText();
            CharSequence newText = currentText.subSequence(0, currentText.length() - 1);
            textBar.setText(newText);
            textBar.append(String.valueOf(key.charAt(0)));
            textBar.append("|");
          }
        );
        break;
    }

  }
}
```

Output



Android Emulator - Pixel_2_API_30:5554

qwerty

ERROR_404|

Learning outcomes

Thus a keyboard was implemented using Android Studio