ANDROID END SEM LAB EXAM

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EXPERIMENT 10

Create a Free Hand Drawing App exactly as shown

ANDROID MANIFEST.XML

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.freehanddrawingapp">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/img"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.AppCompat.Light.NoActionBar">

        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>

    </application>

</manifest>
```

MainActivity.java

```java
package com.example.freehanddrawingapp;

import android.graphics.Color;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
```

```java
    private PaintView paintView;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        paintView = findViewById(R.id.paintView);

        // Set up color buttons
        setupColorButtons();

        // Set up tool buttons
        setupToolButtons();
    }

    private void setupColorButtons() {
        Button colorRed = findViewById(R.id.colorRed);
        Button colorGreen = findViewById(R.id.colorGreen);
        Button colorBlue = findViewById(R.id.colorBlue);
        Button colorYellow = findViewById(R.id.colorYellow);
        Button colorPurple = findViewById(R.id.colorPurple);
        Button colorOrange = findViewById(R.id.colorOrange);
        Button colorCyan = findViewById(R.id.colorCyan);
        Button colorBlack = findViewById(R.id.colorBlack);
        Button colorWhite = findViewById(R.id.colorWhite);
        Button colorGrey = findViewById(R.id.colorGrey);

        // Setting click listeners for all color buttons
        colorRed.setOnClickListener(v -> paintView.setColor(Color.RED));
        colorGreen.setOnClickListener(v -> paintView.setColor(Color.GREEN));
        colorBlue.setOnClickListener(v -> paintView.setColor(Color.BLUE));
        colorYellow.setOnClickListener(v -> paintView.setColor(Color.YELLOW));
        colorPurple.setOnClickListener(v -> paintView.setColor(Color.parseColor("#8E24AA"))); // Purple
color
        colorOrange.setOnClickListener(v -> paintView.setColor(Color.parseColor("#FFA500"))); //
Orange color
        colorCyan.setOnClickListener(v -> paintView.setColor(Color.CYAN));
        colorBlack.setOnClickListener(v -> paintView.setColor(Color.BLACK));
        colorWhite.setOnClickListener(v -> paintView.setColor(Color.WHITE));
        colorGrey.setOnClickListener(v -> paintView.setColor(Color.GRAY));
    }

    private void setupToolButtons() {
        Button buttonPen = findViewById(R.id.buttonPen);
        Button buttonEraser = findViewById(R.id.buttonEraser);
        Button buttonClear = findViewById(R.id.buttonClear);
```

```java
        buttonPen.setOnClickListener(v -> paintView.setPenMode());
        buttonEraser.setOnClickListener(v -> paintView.setEraserMode());
        buttonClear.setOnClickListener(v -> paintView.clearCanvas());
    }
}
```

PaintView.java

```java
package com.example.freehanddrawingapp;

import android.content.Context;
import android.graphics.Bitmap;
import android.graphics.Canvas;
import android.graphics.Color;
import android.graphics.Paint;
import android.graphics.Path;
import android.util.AttributeSet;
import android.view.MotionEvent;
import android.view.View;
import android.graphics.PorterDuff;
import android.graphics.PorterDuffXfermode;


public class PaintView extends View {

    private Paint paint;
    private Path path;
    private Bitmap bitmap;
    private Canvas bitmapCanvas;
    private boolean isEraserMode = false; // Variable to track eraser mode

    public PaintView(Context context, AttributeSet attrs) {
        super(context, attrs);
        setup();
    }

    public PaintView(Context context) {
        super(context);
        setup();
    }

    private void setup() {
        paint = new Paint();
        path = new Path();
        paint.setColor(Color.BLACK); // Default paint color
        paint.setStyle(Paint.Style.STROKE);
```

```java
        paint.setStrokeWidth(10); // Default stroke width
        paint.setAntiAlias(true);
    }

    @Override
    protected void onSizeChanged(int w, int h, int oldw, int oldh) {
        super.onSizeChanged(w, h, oldw, oldh);
        // Create a bitmap to hold the drawing
        bitmap = Bitmap.createBitmap(w, h, Bitmap.Config.ARGB_8888);
        bitmapCanvas = new Canvas(bitmap);
    }

    @Override
    protected void onDraw(Canvas canvas) {
        super.onDraw(canvas);
        canvas.drawBitmap(bitmap, 0, 0, null);
        canvas.drawPath(path, paint); // Draw the current path on the canvas
    }

    @Override
    public boolean onTouchEvent(MotionEvent event) {
        float x = event.getX();
        float y = event.getY();

        switch (event.getAction()) {
            case MotionEvent.ACTION_DOWN:
                path.moveTo(x, y); // Start a new path
                return true;
            case MotionEvent.ACTION_MOVE:
                path.lineTo(x, y); // Draw a line to the current position
                break;
            case MotionEvent.ACTION_UP:
                if (isEraserMode) {
                    // If in eraser mode, clear the path on the bitmap using the background color
                    paint.setXfermode(new PorterDuffXfermode(PorterDuff.Mode.CLEAR));
                    bitmapCanvas.drawPath(path, paint); // Draw the eraser path on the bitmap
                } else {
                    bitmapCanvas.drawPath(path, paint); // Draw the path on the bitmap
                }
                path.reset(); // Clear the path for the next stroke
                break;
            default:
                return false;
        }

        invalidate(); // Request a redraw
        return true;
    }
```

```java
    public void clearCanvas() {
        path.reset(); // Reset the path
        bitmap.eraseColor(Color.WHITE); // Clear the bitmap to white
        invalidate(); // Request a redraw
    }

    public void setColor(int color) {
        paint.setColor(color); // Change the paint color
        isEraserMode = false; // Ensure we're not in eraser mode
    }

    public void setBrushSize(float size) {
        paint.setStrokeWidth(size); // Change the brush size
    }

    // Method to switch to pen mode
    public void setPenMode() {
        isEraserMode = false;
        paint.setXfermode(null);
    }

    // Method to switch to eraser mode
    public void setEraserMode() {
        isEraserMode = true;
        paint.setXfermode(new PorterDuffXfermode(PorterDuff.Mode.CLEAR));
    }
}
```

activity_main.xml

```xml
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

    <!-- College Logo -->
    <!-- College Logo -->
    <ImageView
        android:id="@+id/collegeLogo"
        android:layout_width="150dp"
        android:layout_height="150dp"
        android:layout_gravity="center"
        android:src="@drawable/amritalogo"
        android:contentDescription="College Logo"
        android:adjustViewBounds="true"
```

```xml
        android:layout_marginTop="2dp"/>

    <!-- Name TextView -->
    <TextView
        android:id="@+id/nameTextView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="chaitanya sundar jose"
        android:textSize="14sp"
        android:layout_marginTop="4dp"
        android:layout_gravity="center" />

    <!-- Roll Number TextView -->
    <TextView
        android:id="@+id/rollNumberTextView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Roll: Ch.en.u4cys21095"
        android:textSize="14sp"
        android:layout_marginTop="4dp"
        android:layout_gravity="center" />

    <!-- Drawing view -->
    <com.example.freehanddrawingapp.PaintView
        android:id="@+id/paintView"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"/>

    <!-- Color selection panel -->
    <GridLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:rowCount="2"
        android:columnCount="5"
        android:layout_marginTop="10dp"
        android:layout_marginBottom="10dp"
        android:padding="5dp">

        <!-- Color Buttons -->
        <Button
            android:id="@+id/colorRed"
            android:layout_width="0dp"
            android:layout_height="50dp"
            android:layout_columnWeight="1"
            android:background="@android:color/holo_red_light"/>

        <Button
```

```xml
    android:id="@+id/colorGreen"
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:layout_columnWeight="1"
    android:background="@android:color/holo_green_light"/>

<Button
    android:id="@+id/colorBlue"
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:layout_columnWeight="1"
    android:background="@android:color/holo_blue_light"/>

<Button
    android:id="@+id/colorYellow"
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:layout_columnWeight="1"
    android:background="@android:color/holo_orange_light"/>

<Button
    android:id="@+id/colorPurple"
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:layout_columnWeight="1"
    android:background="#8E24AA"/>

<Button
    android:id="@+id/colorOrange"
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:layout_columnWeight="1"
    android:background="@android:color/holo_orange_dark"/>

<Button
    android:id="@+id/colorCyan"
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:layout_columnWeight="1"
    android:background="@android:color/holo_blue_bright"/>

<Button
    android:id="@+id/colorBlack"
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:layout_columnWeight="1"
    android:background="@android:color/black"/>
```

```xml
    <Button
        android:id="@+id/colorWhite"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/white"/>

    <Button
        android:id="@+id/colorGrey"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/darker_gray"/>
</GridLayout>

<!-- Tool buttons like pen, eraser, and clear -->
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_gravity="bottom"
    android:padding="10dp">

    <Button
        android:id="@+id/buttonPen"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="Pen"/>

    <Button
        android:id="@+id/buttonEraser"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="Eraser"/>

    <Button
        android:id="@+id/buttonClear"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="Clear"/>
</LinearLayout>

</LinearLayout>
```

Color_palette.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<GridLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:rowCount="2"
    android:columnCount="5"
    android:layout_marginTop="10dp"
    android:layout_marginBottom="10dp"
    android:padding="5dp">

    <!-- Color Buttons with Different IDs -->
    <Button
        android:id="@+id/colorRed"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/holo_red_light" />

    <Button
        android:id="@+id/colorGreen"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/holo_green_light" />

    <Button
        android:id="@+id/colorBlue"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/holo_blue_light" />

    <Button
        android:id="@+id/colorYellow"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/holo_orange_light" />

    <Button
        android:id="@+id/colorPurple"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="#8E24AA" />

    <Button
```

```xml
        android:id="@+id/colorOrange"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/holo_orange_dark" />

    <Button
        android:id="@+id/colorCyan"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/holo_blue_bright" />

    <Button
        android:id="@+id/colorBlack"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/black" />

    <Button
        android:id="@+id/colorWhite"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/white" />

    <Button
        android:id="@+id/colorGrey"
        android:layout_width="0dp"
        android:layout_height="50dp"
        android:layout_columnWeight="1"
        android:background="@android:color/darker_gray" />

</GridLayout>
```
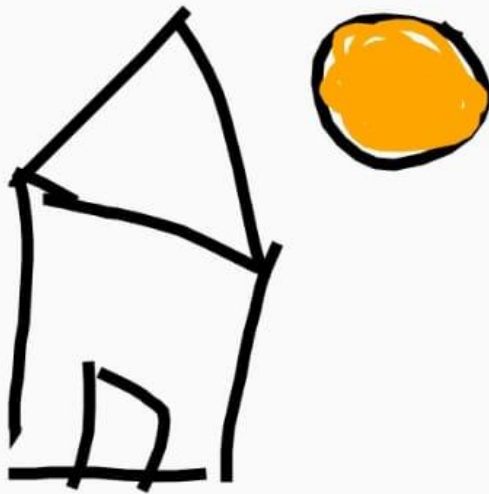
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