



Vidya Vikas Education Trust's
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Vasai-401212 Accredited by B+ Grade by NAAC

Experiment No.06: Drawing Canvas

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Aim: Write an application that draws basic graphical primitives on the screen.

Theory: A Drawing Canvas App is a software application that allows users to draw or create digital art on a virtual canvas using various tools and features such as pens, brushes, colours, shapes, layers, and more. The theory behind a Drawing Canvas App is based on the principles of digital art creation and user experience design.

One important aspect of a Drawing Canvas App is the user interface, which should be intuitive and easy to use, with clear icons and labels for each tool and feature. The app should also provide users with the ability to customize their workspace and tools to suit their needs.

Another important aspect is the rendering engine, which is responsible for displaying the artwork in real time as the user creates it. This engine should be optimized for performance and provide high-quality output, regardless of the user's device or screen resolution.

The Drawing Canvas App should also provide users with a range of tools for creating different types of art, such as brushes for painting, pens for drawing lines, and shapes for creating geometric designs. Additionally, users should be able to add text, images, and other elements to their artwork, as well as apply various effects and filters to enhance their creations.

Other important features that can be included in a Drawing Canvas App are the ability to save and share artwork, collaborate with other users, and access a library of pre-made templates, images, and other resources.

Overall, the theory behind a Drawing Canvas App is to provide users with a versatile and user-friendly tool for creating digital art, while also optimizing performance and providing high-quality output.

PROGRAM –

MainActivity.java

```
package co.martinbaciga.drawingtest.ui.activity;
```

```
import android.app.AlertDialog;  
import android.content.DialogInterface;  
import android.content.Intent;  
import android.content.pm.PackageManager;
```



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```
import android.net.Uri;
import android.support.v4.content.ContextCompat;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuItem;
import android.widget.ImageView;
import android.widget.Toast;

import org.xdty.preference.colorpicker.ColorPickerDialog;
import org.xdty.preference.colorpicker.ColorPickerSwatch;

import butterknife.BindView;
import butterknife.ButterKnife;
import butterknife.OnClick;
import co.martinbaciga.drawingtest.R;
import co.martinbaciga.drawingtest.domain.manager.FileManager;
import co.martinbaciga.drawingtest.domain.manager.PermissionManager;
import co.martinbaciga.drawingtest.ui.component.DrawingView;
import co.martinbaciga.drawingtest.ui.dialog.StrokeSelectorDialog;

public class MainActivity extends AppCompatActivity
{
    @BindView(R.id.main_drawing_view) DrawingView mDrawingView;
    @BindView(R.id.main_fill_iv) ImageView mFillBackgroundImageView;
    @BindView(R.id.main_color_iv) ImageView mColorImageView;
    @BindView(R.id.main_stroke_iv) ImageView mStrokeImageView;
    @BindView(R.id.main_undo_iv) ImageView mUndoImageView;
    @BindView(R.id.main_redo_iv) ImageView mRedoImageView;

    private int mCurrentBackgroundColor;
    private int mCurrentColor;
    private int mCurrentStroke;
    private static final int MAX_STROKE_WIDTH = 50;

    @Override
    protected void onCreate(Bundle savedInstanceState)
```



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```
{
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    ButterKnife.bind(this);

    initDrawingView();
}

@Override
public boolean onCreateOptionsMenu(Menu menu) {
    getMenuInflater().inflate(R.menu.menu_main, menu);
    return true;
}

@Override
public boolean onOptionsItemSelected(MenuItem item)
{
    switch (item.getItemId())
    {
        case R.id.action_share:
            requestPermissionsAndSaveBitmap();
            break;
        case R.id.action_clear:
            new AlertDialog.Builder(this)
                .setTitle("Clear canvas")
                .setMessage("Are you sure you want to clear the canvas?")
                .setPositiveButton("Yes", new DialogInterface.OnClickListener()
                {
                    @Override
                    public void onClick(DialogInterface dialog, int which) {
                        mDrawingView.clearCanvas();
                    }
                })
                .setNegativeButton("Cancel", null)
                .show();
            break;
    }
}
```



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```
return super.onOptionsItemSelected(item);  
}
```

```
private void initDrawingView()  
{  
    mCurrentBackgroundColor = ContextCompat.getColor(this, android.R.color.white);  
    mCurrentColor = ContextCompat.getColor(this, android.R.color.black);  
    mCurrentStroke = 10;  
  
    mDrawingView.setBackgroundColor(mCurrentBackgroundColor);  
    mDrawingView.setPaintColor(mCurrentColor);  
    mDrawingView.setPaintStrokeWidth(mCurrentStroke);  
}
```

```
private void startFillBackgroundDialog()  
{  
    int[] colors = getResources().getIntArray(R.array.palette);
```

```
    ColorPickerDialog dialog =  
    ColorPickerDialog.newInstance(R.string.color_picker_default_title,  
        colors,  
        mCurrentBackgroundColor,  
        5,  
        ColorPickerDialog.SIZE_SMALL);
```

```
    dialog.setOnColorSelectedListener(new ColorPickerSwatch.OnColorSelectedListener()  
{
```

```
        @Override  
        public void onColorSelected(int color)  
        {  
            mCurrentBackgroundColor = color;  
            mDrawingView.setBackgroundColor(mCurrentBackgroundColor);  
        }  
    });
```



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```
dialog.show(getFragmentManager(), "ColorPickerDialog");
}

private void startColorPickerDialog()
{
    int[] colors = getResources().getIntArray(R.array.palette);

    ColorPickerDialog dialog =
    ColorPickerDialog.newInstance(R.string.color_picker_default_title,
        colors,
        mCurrentColor,
        5,
        ColorPickerDialog.SIZE_SMALL);

    dialog.setOnColorSelectedListener(new ColorPickerSwatch.OnColorSelectedListener()
    {

        @Override
        public void onColorSelected(int color)
        {
            mCurrentColor = color;
            mDrawingView.setPaintColor(mCurrentColor);
        }

    });

    dialog.show(getFragmentManager(), "ColorPickerDialog");
}

private void startStrokeSelectorDialog()
{
    StrokeSelectorDialog dialog = StrokeSelectorDialog.newInstance(mCurrentStroke,
    MAX_STROKE_WIDTH);

    dialog.setOnStrokeSelectedListener(new StrokeSelectorDialog.OnStrokeSelectedListener()
    {
        @Override
```



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```
public void onStrokeSelected(int stroke)
{
    mCurrentStroke = stroke;
    mDrawingView.setPaintStrokeWidth(mCurrentStroke);
}
});

dialog.show(getSupportFragmentManager(), "StrokeSelectorDialog");
}

private void startShareDialog(Uri uri)
{
    Intent intent = new Intent();
    intent.setAction(Intent.ACTION_SEND);
    intent.setType("image/*");

    intent.putExtra(android.content.Intent.EXTRA_SUBJECT, "");
    intent.putExtra(android.content.Intent.EXTRA_TEXT, "");
    intent.putExtra(Intent.EXTRA_STREAM, uri);
    intent.addFlags(Intent.FLAG_GRANT_READ_URI_PERMISSION);
    startActivity(Intent.createChooser(intent, "Share Image"));
}

private void requestPermissionsAndSaveBitmap()
{
    if (PermissionManager.checkWriteStoragePermissions(this))
    {
        Uri uri = FileManager.saveBitmap(this, mDrawingView.getBitmap());
        startShareDialog(uri);
    }
}

@Override
public void onRequestPermissionsResult(int requestCode, String[] permissions, int[]
grantResults)
{

```



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```
super.onRequestPermissionsResult(requestCode, permissions, grantResults);
    switch (requestCode)
    {
        case PermissionManager.REQUEST_WRITE_STORAGE:
        {
            if (grantResults.length > 0 && grantResults[0] ==
PackageManager.PERMISSION_GRANTED)
            {
                Uri uri = FileManager.saveBitmap(this, mDrawingView.getBitmap());
                startShareDialog(uri);
            } else
            {
                Toast.makeText(this, "The app was not allowed to write to your storage. Hence, it
cannot function properly. Please consider granting it this permission",
Toast.LENGTH_LONG).show();
            }
        }
    }
}

@OnClick(R.id.main_fill_iv)
public void onBackgroundFillOptionClick()
{
    startFillBackgroundDialog();
}

@OnClick(R.id.main_color_iv)
public void onColorOptionClick()
{
    startColorPickerDialog();
}

@OnClick(R.id.main_stroke_iv)
public void onStrokeOptionClick()
{
    startStrokeSelectorDialog();
}
```

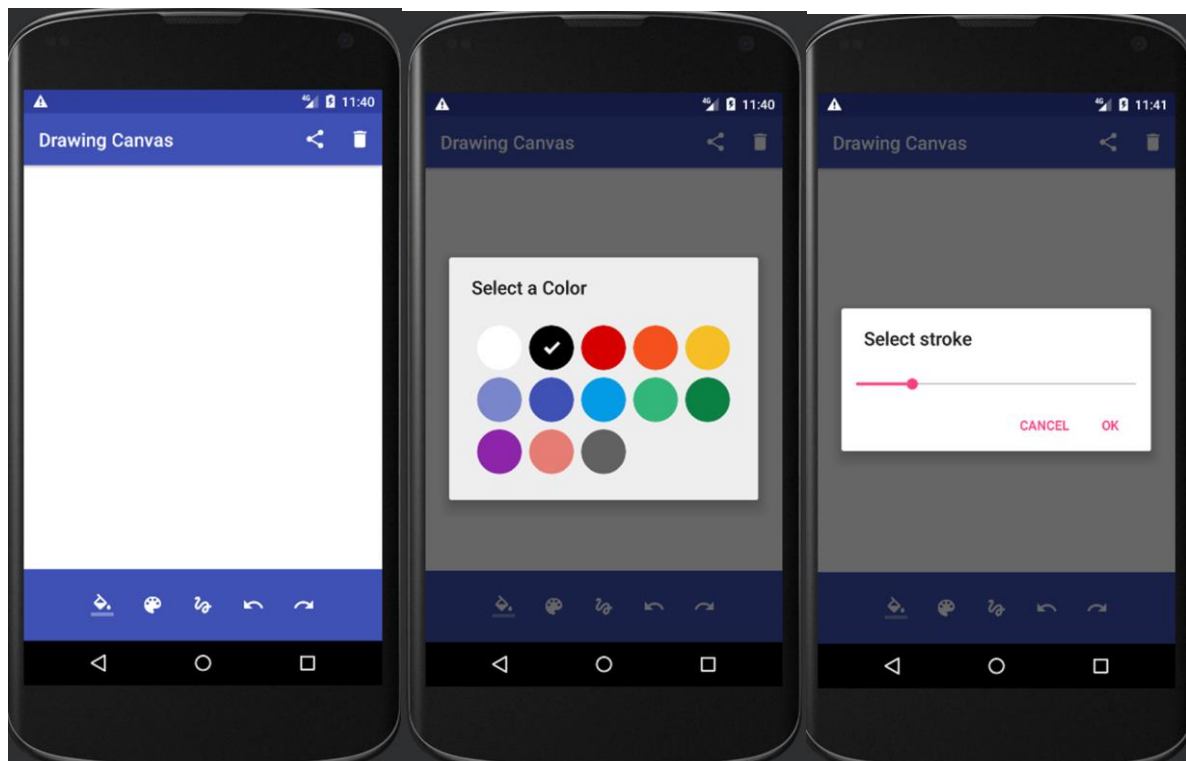


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```
@OnClick(R.id.main_undo_iv)
public void onUndoOptionClick()
{
    mDrawingView.undo();
}

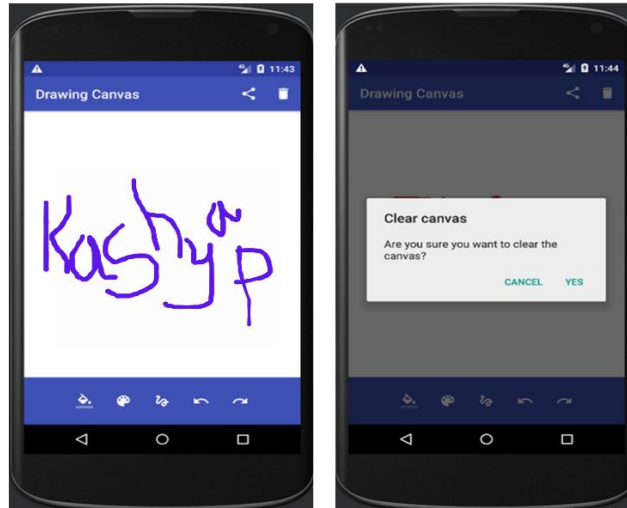
@OnClick(R.id.main_redo_iv)
public void onRedoOptionClick()
{
    mDrawingView.redo();
}
}
```

OUTPUT: -





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GitHub Link: - <https://github.com/jayparekh1290/Mobile-Computing-Lab/tree/main/Drawing/android-drawing-canvas-master>

Conclusion: - The experiment was about the Drawing Canvas APP using Android which is successfully implemented and verified.