

Experiment 09: Write an application that draws basic graphical primitives in the screen

PART A

A.1 Aim: To write an application that draws basic graphical primitives in the screen.

A.2 Objectives: To introduce students with various tools like Android Studio, NS2, Wire-shark, Cisco packet tracer, WAP supported browser etc.

A.3 Outcome: After successful completion of this experiment students will be able to develop an application that draws basic graphical primitives in the screen.

A.4 Theory:

SOFTWARE:

- Android Studio
- The Android SDK (Starter Package)
- Gradle
- Java Development Kit (JDK) 5

DESCRIPTION:

8. Open android studio and select new android project .
9. Give project name and select next
10. Choose the android version.

11. Enter the package name. package name must be two word separated by comma and click finish
12. Go to package explorer in the left hand side and select our project.
13. Go to res folder and select layout. Double click the main.xml file 14. Now you can see the Graphics layout window.

SourceCode:

CodeforActivity_main.xml:

```
<?xmlversion="1.0"encoding="utf-8"?>
<RelativeLayoutxmlns:android="http://schemas.android.com/apk
/res/android"android:layout_width="match_parent"android:layo
ut_height=" match_parent">

<ImageView
    android:layout_width="match_pare
    nt"android:layout_height="match_p
    arent"android:id="@+id/imageVie
    w"/>

< /RelativeLayout >
```

Code for MainActivity.java:

```
package com.example.exno4;
import android.app.Activity;
import
android.graphics.Bitmap;
import
android.graphics.Canvas;

import
android.graphics.Color;
import android.graphics.Pain
t;

import android.graphics.drawable.BitmapDrawable;

import android.os.Bundle;
import android.widget.ImageView;
public class MainActivity extends Activi
ty
{
    @Override
    public void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState); setContentView(R.layout.a ctivity_main);

        //Creating a Bitmap
        Bitmap bg = Bitmap.createBitmap(720, 1280, Bitmap.Config.ARGB_888
8);

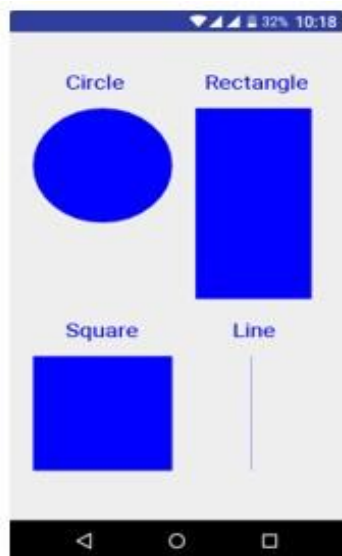
        //Setting the Bitmap as background for the
        ImageView imageView = (ImageView)
```

```
findViewById(R.id.imageView);i.setBackgroundDrawable  
le(newBitmapDrawable(bg)); //CreatingtheCanvasObject  
  
Canvascanvas=newCanvas(bg  
);  
//Creating the Paint Object and set its color  
&TextSizePaint paint = new  
Paint();paint.setColor(Color.BLUE);paint.se  
tTextSize(50);  
  
//To draw a  
Rectanglecanvas.drawText("Rectangle",  
420,150,paint); canvas.drawRect(400,200,650,700,pain  
t);
```

```
//Todrawa Circle
    canvas.drawText("Circle",120,150,paint);
    canvas.drawCircle(200,350,150,paint);
//Todrawa Square
    canvas.drawText("Square",120,800,paint);
    canvas.drawRect(50,850,350,1150,paint);
//Todrawa Line
    canvas.drawText("Line",480,800,paint);

    canvas.drawLine(520,850,520,1150,paint);
}
}
```

Output:



PART B**(PART B: TO BE COMPLETED BY STUDENTS)**

(Students must submit the soft copy as per following segments within two hours of the practical. The soft copy must be uploaded on the Blackboard or emailed to the concerned lab in charge faculties at the end of the practical in case there is no Blackboard access available)

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Class TE B Comps	Batch: B2
Date of Experiment:	Date of Submission:
Grade:	

B.1 Software Code written by student/steps:

MainActivity.java:

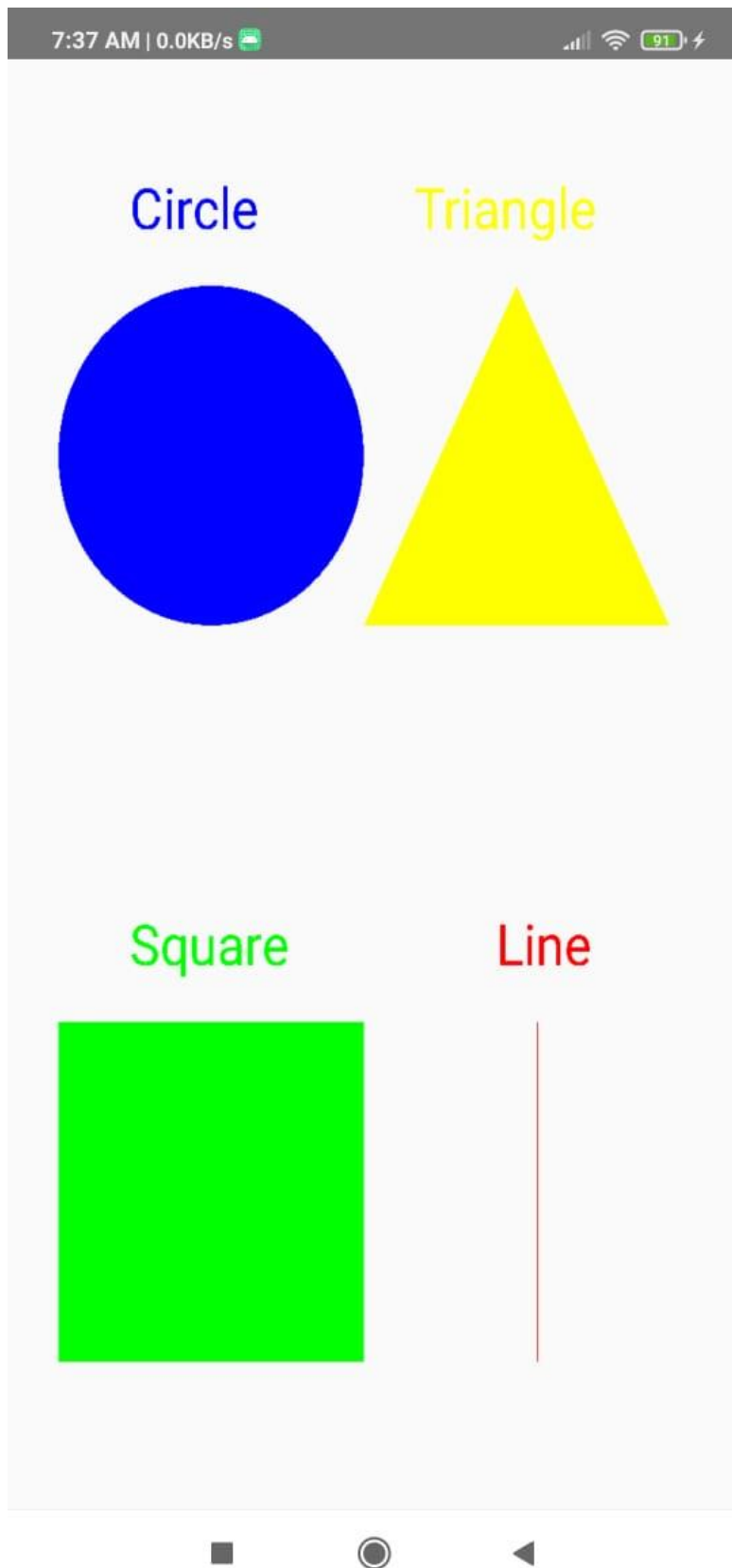
```
package com.example.exp9;
import android.app.Activity;
import android.graphics.Bitmap;
import android.graphics.Canvas;
import android.graphics.Color;
import android.graphics.Paint;
import android.graphics.Path;
import android.graphics.drawable.BitmapDrawable;
import android.os.Bundle;
import android.widget.ImageView;
public class MainActivity extends Activity {
    @Override
```

```
protected void onCreate(Bundle savedInstanceState) {  
    super.onCreate(savedInstanceState);  
    setContentView(R.layout.activity_main); // Make sure this matches the XML file name  
    // Creating a Bitmap  
    Bitmap bg = Bitmap.createBitmap(720, 1280, Bitmap.Config.ARGB_8888); // Setting the  
    Bitmap as background for the ImageView  
    ImageView i = findViewById(R.id.imageView); // Ensure ID matches XML  
    i.setBackground(new BitmapDrawable(getResources(), bg)); // Updated deprecated  
    method  
    // Creating the Canvas Object  
    Canvas canvas = new Canvas(bg);  
    // Creating the Paint Object and setting its color & TextSize  
    Paint paint = new Paint();  
    paint.setColor(Color.BLUE);  
    paint.setTextSize(50);  
    // Drawing shapes  
    paint.setColor(Color.BLUE);  
    canvas.drawText("Circle", 120, 150, paint);  
    canvas.drawCircle(200, 350, 150, paint);  
    paint.setColor(Color.GREEN);  
    canvas.drawText("Square", 120, 800, paint);  
    canvas.drawRect(50, 850, 350, 1150, paint);  
    paint.setColor(Color.YELLOW);  
    canvas.drawText("Triangle", 400, 150, paint);  
    Path path = new Path();  
    path.moveTo(500, 200);  
    path.lineTo(350, 500);  
    path.lineTo(650, 500);  
    path.close();  
    canvas.drawPath(path, paint);  
    paint.setColor(Color.RED);  
    canvas.drawText("Line", 480, 800, paint);  
    canvas.drawLine(520, 850, 520, 1150, paint);  
}  
}
```

AndroidManifest.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.exp9">
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.EXP9">
        <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>
```

B.2 Input and Output:



B.3 Observations and learning:

During the experiment, an application was successfully developed using Android Studio to draw basic graphical primitives such as rectangles, circles, squares, and lines on the screen. The implementation involved setting up an Android project, defining the layout in `activity_main.xml`, and writing Java code in `MainActivity.java` to create a Canvas object and use the Paint class to draw shapes. The experiment allowed students to understand how graphical elements are rendered in an Android application. Additionally, the experiment introduced students to essential development tools like Android Studio, Gradle, and the Android SDK, helping them gain hands-on experience in mobile application development.

B.4 Conclusion:

This experiment provided practical exposure to developing a simple graphics-based Android application, enhancing students' understanding of GUI programming in mobile applications. By using Android Studio and Java, students learned how to work with the Canvas and Paint classes to draw and manipulate graphical objects dynamically. The experiment also reinforced the importance of object-oriented programming concepts in application development. Overall, it served as a foundation for more advanced graphics programming in Android, preparing students for future projects involving interactive user interfaces and custom graphics.

B.5 Question of Curiosity**1) Explain different steps required to build up this project?**

1. Open android studio and select new android project.
2. Give project name and select next
3. Then select the Minimum SDK as shown below and click Next.
4. Then select the Empty Activity and click Next.
5. Finally click Finish.
6. Click on app -> res -> layout -> activity_main.xml.
7. Drag and drop relative layout and change its properties Drag and drop image view and change its properties according to our programs Screen layout can be viewed by clicking graphics layout tab
8. Now click on Design and your application will look as given below.
9. Click on app -> java -> com.example.exp4 -> MainActivity.
10. Override OnCreate() function
11. Create bitmap and canvas objects.

12. Save the program.
13. Run the program.
14. Output can be viewed in the android emulator.