

Department of Computer Science and Engineering

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UCS1711 - Mobile Application Development Lab

Exercise 3: Application Development using basic graphical primitives

Objective:

Draw shapes such as Line, Circle, Rectangle and Arc.

Code:

Main Activity:

Design:

```

1 <?xml version="1.0" encoding="utf-8"?>
2 <!--<androidx.constraintlayout.widget.ConstraintLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   -->
3 <!--     xmlns:app="http://schemas.android.com/apk/res-auto" --
   >
4 <!--     xmlns:tools="http://schemas.android.com/tools" -->
5 <!--     android:layout_width="match_parent" -->
6 <!--     android:layout_height="match_parent" -->
7 <!--     tools:context=".ShapesActivity" -->
8
9 <!--</androidx.constraintlayout.widget.ConstraintLayout>-->
10 <RelativeLayout xmlns:android="http://schemas.android.com/apk
   /res/android"
11     xmlns:app="http://schemas.android.com/apk/res-auto"
12     xmlns:tools="http://schemas.android.com/tools"
13     android:layout_width="match_parent"
14     android:layout_height="match_parent"
15     tools:context=".MainActivity">
16     <ImageView
17         android:layout_width="match_parent"
18         android:layout_height="match_parent"
19         android:id="@+id/imageView"/>
20 </RelativeLayout>

```

Behaviour:

```

1 package com.example.graphics;
2
3 import androidx.appcompat.app.AppCompatActivity;
4
5 import android.content.Intent;
6 import android.graphics.Bitmap;
7 import android.graphics.Canvas;
8 import android.graphics.Color;
9 import android.graphics.Paint;
10 import android.graphics.drawable.BitmapDrawable;
11 import android.os.Bundle;
12 import android.widget.ImageView;
13
14 public class ShapesActivity extends AppCompatActivity {
15
16     @Override
17     protected void onCreate(Bundle savedInstanceState) {
18

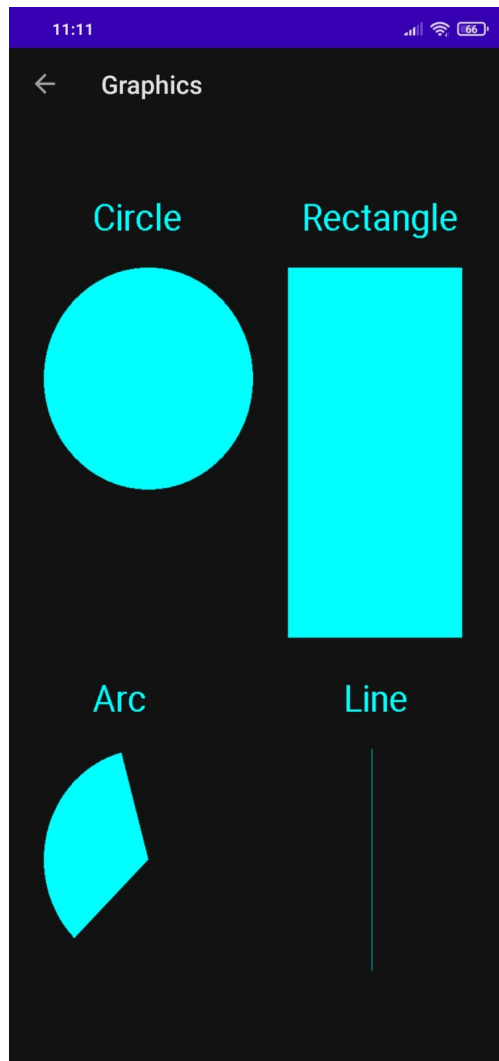
```

```

19         super.onCreate(savedInstanceState);
20         setContentView(R.layout.activity_shapes);
21
22         Intent intent = getIntent();
23
24         Bitmap bg = Bitmap.createBitmap(720, 1280, Bitmap.
Config.ARGB_8888);
25         ImageView i = (ImageView) findViewById(R.id.imageView
);
26
27         i.setBackgroundDrawable(new BitmapDrawable(bg));
28         Canvas canvas = new Canvas(bg);
29         Paint paint = new Paint();
30         paint.setColor(Color.CYAN);
31         paint.setTextSize(50);
32
33         //To draw a Rectangle
34         canvas.drawText("Rectangle", 420, 150, paint);
35         canvas.drawRect(400, 200, 650, 700, paint);
36
37         //To draw a Circle
38         canvas.drawText("Circle", 120, 150, paint);
39         canvas.drawCircle(200, 350, 150, paint);
40
41         //To draw an arc
42         canvas.drawText("Arc", 120, 800, paint);
43         canvas.drawArc(50, 850, 350, 1150, 135, 120, true,
paint);
44
45         //To draw a Line
46         canvas.drawText("Line", 480, 800, paint);
47         canvas.drawLine(520, 850, 520, 1150, paint);
48
49
50
51     }
52 }

```

Output:



Objective:

Draw a car and animate the car.

Code:

Main Activity:

Design:

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <!--<androidx.constraintlayout.widget.ConstraintLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   -->
3 <!-- xmlns:app="http://schemas.android.com/apk/res-auto"--
   >
4 <!-- xmlns:tools="http://schemas.android.com/tools"-->
5 <!-- android:layout_width="match_parent"-->
6 <!-- android:layout_height="match_parent"-->
7 <!-- tools:context=".MainActivity"-->
8
9 <!-- <TextView-->
10 <!-- android:layout_width="wrap_content"-->
11 <!-- android:layout_height="wrap_content"-->
12 <!-- android:text="Hello World!"-->
13 <!-- app:layout_constraintBottom_toBottomOf="parent"--
   >
14 <!-- app:layout_constraintLeft_toLeftOf="parent"-->
15 <!-- app:layout_constraintRight_toRightOf="parent"-->
16 <!-- app:layout_constraintTop_toTopOf="parent" />-->
17
18 <!--</androidx.constraintlayout.widget.ConstraintLayout-->
19
20 <RelativeLayout
21     xmlns:android="http://schemas.android.com/apk/res/android"
   "
22     xmlns:tools="http://schemas.android.com/tools"
23     android:layout_width="match_parent"
24     android:layout_height="match_parent"
```

```

25     tools:context=".MainActivity">
26
27     <Button
28         android:id="@+id/bt_fade"
29         android:layout_width="wrap_content"
30         android:layout_height="wrap_content"
31         android:layout_alignParentStart="true"
32         android:layout_alignParentLeft="true"
33         android:layout_alignParentTop="true"
34         android:layout_centerHorizontal="true"
35         android:layout_marginStart="161dp"
36         android:layout_marginLeft="161dp"
37         android:layout_marginTop="198dp"
38         android:text="Fade" />
39
40     <Button
41         android:id="@+id/bt_rotate"
42         android:layout_width="wrap_content"
43         android:layout_height="wrap_content"
44         android:layout_alignParentStart="true"
45         android:layout_alignParentLeft="true"
46         android:layout_alignParentTop="true"
47         android:layout_marginStart="278dp"
48         android:layout_marginLeft="278dp"
49         android:layout_marginTop="195dp"
50         android:text="Rotate" />
51
52     <Button
53         android:id="@+id/bt_down"
54         android:layout_width="wrap_content"
55         android:layout_height="wrap_content"
56         android:layout_alignParentTop="true"
57         android:layout_centerHorizontal="true"
58         android:layout_marginTop="127dp"
59         android:text="Down" />
60
61     <Button
62         android:id="@+id/bt_zoom"
63         android:layout_width="wrap_content"
64         android:layout_height="wrap_content"
65         android:layout_alignParentStart="true"
66         android:layout_alignParentLeft="true"
67         android:layout_alignParentTop="true"
68         android:layout_marginStart="46dp"
69         android:layout_marginLeft="46dp"

```

```

70         android:layout_marginTop="200dp"
71         android:text="Zoom" />
72
73     <Button
74         android:id="@+id/bt_up"
75         android:layout_width="wrap_content"
76         android:layout_height="wrap_content"
77         android:layout_below="@+id/bt_zoom"
78         android:layout_alignParentEnd="true"
79         android:layout_alignParentRight="true"
80         android:layout_centerHorizontal="true"
81         android:layout_marginTop="-238dp"
82         android:layout_marginEnd="163dp"
83         android:layout_marginRight="163dp"
84         android:text="Up" />
85
86     <Button
87         android:id="@+id/bt_forward"
88         android:layout_width="wrap_content"
89         android:layout_height="wrap_content"
90         android:layout_below="@+id/bt_up"
91         android:layout_alignParentStart="true"
92         android:layout_marginStart="216dp"
93         android:layout_marginTop="4dp"
94         android:text="Forward" />
95
96     <Button
97         android:id="@+id/bt_backward"
98         android:layout_width="wrap_content"
99         android:layout_height="wrap_content"
100        android:layout_below="@+id/bt_forward"
101        android:layout_alignParentStart="true"
102        android:layout_alignParentLeft="true"
103        android:layout_marginStart="74dp"
104        android:layout_marginLeft="74dp"
105        android:layout_marginTop="-46dp"
106        android:text="Backward" />
107
108     <ImageView
109         android:id="@+id/iv_animate"
110         android:layout_width="match_parent"
111         android:layout_height="200dp"
112         android:layout_below="@+id/bt_backward"
113         android:layout_centerInParent="true"
114         android:layout_marginLeft="30dp"

```

```

115         android:layout_marginTop="214dp"
116         android:layout_marginRight="30dp"
117         android:background="@drawable/car" />
118
119     <Button
120         android:id="@+id/bt_next"
121         android:layout_width="wrap_content"
122         android:layout_height="wrap_content"
123         android:layout_alignParentEnd="true"
124         android:layout_alignParentRight="true"
125         android:layout_alignParentBottom="true"
126         android:layout_marginEnd="69dp"
127         android:layout_marginRight="69dp"
128         android:layout_marginBottom="60dp"
129         android:onClick="nextPage"
130         android:text="Next" />
131 </RelativeLayout>

```

Behaviour:

```

1 package com.example.graphics;
2
3 import androidx.appcompat.app.AppCompatActivity;
4
5 import android.content.Intent;
6 import android.os.Bundle;
7 import android.view.View;
8 import android.view.animation.AnimationUtils;
9 import android.widget.Button;
10 import android.widget.ImageView;
11
12 public class MainActivity extends AppCompatActivity{
13
14     @Override
15     protected void onCreate(Bundle savedInstanceState) {
16         super.onCreate(savedInstanceState);
17         setContentView(R.layout.activity_main);
18
19         Button bt_zoom=findViewById(R.id.bt_zoom);
20         Button bt_fade=findViewById(R.id.bt_fade);
21         Button bt_rotate=findViewById(R.id.bt_rotate);
22         Button bt_down=findViewById(R.id.bt_down);
23         Button bt_up=findViewById(R.id.bt_up);
24         Button bt_forward=findViewById(R.id.bt_forward);
25         Button bt_backward=findViewById(R.id.bt_backward);

```



```

26         final ImageView iv_animate=findViewById(R.id.
iv_animate);
27
28         bt_zoom.setOnClickListener(new View.OnClickListener()
29         {
30             @Override
31             public void onClick(View v) {
32                 iv_animate.startAnimation(AnimationUtils.
loadAnimation(getApplicationContext(),R.anim.zoom_in));
33             }
34         });
35         bt_fade.setOnClickListener(new View.OnClickListener()
36         {
37             @Override
38             public void onClick(View v) {
39                 iv_animate.startAnimation(AnimationUtils.
loadAnimation(getApplicationContext(),R.anim.fade_in));
40             }
41         });
42         bt_rotate.setOnClickListener(new View.OnClickListener
43         () {
44             @Override
45             public void onClick(View v) {
46                 iv_animate.startAnimation(AnimationUtils.
loadAnimation(getApplicationContext(),R.anim.rotate_in));
47             }
48         });
49         bt_up.setOnClickListener(new View.OnClickListener() {
50             @Override
51             public void onClick(View v) {
52                 iv_animate.animate().translationYBy(-300f).
setDuration(600);
53             }
54         });
55         bt_down.setOnClickListener(new View.OnClickListener()
56         {
57             @Override
58             public void onClick(View v) {
59                 iv_animate.animate().translationYBy(300f).
setDuration(600);
60             }
61         });

```

```

61         bt_forward.setOnClickListener(new View.
onClickListener() {
62             @Override
63             public void onClick(View v) {
64                 iv_animate.animate().translationXBy(300f).
setDuration(600);
65             }
66         });
67         bt_backward.setOnClickListener(new View.
onClickListener() {
68             @Override
69             public void onClick(View v) {
70                 iv_animate.animate().translationXBy(-300f).
setDuration(600);
71             }
72         });
73
74     }
75     public void nextPage(View view) {
76         Intent intent = new Intent(this, ShapesActivity.class
);
77         startActivity(intent);
78
79     }
80
81 }

```

Output:

