Running Your Application

Now you can run your Android code either on your Android device or through Android Emulator. I will be telling you to run your application on Android Emulator for this you need to set up your Android Virtual Device that would run your code , now to set up a Android Virtual Device or AVD you need to create one using the Android Virtual Device Manager or the AVD Manager, in order to do so follow these steps –

1.Open up the AVD Manager.
2.In the Android Virtual Device Manager panel, click New.
3.Fill in the details for the AVD. Give it a name, a platform target, an SD card size, and a skin (HVGA is default).
4.Click Create AVD.
5.Select the new AVD from the Android Virtual Device Manager and click Start.
6.After the emulator boots up, unlock the emulator screen.

Android Programs

Program-1 Write an android program to print Hello World

MainActivity.kt

```
package com.example.helloworld

import android.os.Bundle
import androidx.activity.ComponentActivity
import androidx.activity.compose.setContent
import androidx.activity.enableEdgeToEdge
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.foundation.layout.padding
import androidx.compose.material3.Scaffold
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.ui.Modifier
import androidx.compose.ui.tooling.preview.Preview
import com.example.helloworld.ui.theme.HelloWorldTheme

class MainActivity : ComponentActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContent {
            HelloWorldTheme {
                Scaffold(modifier = Modifier.fillMaxSize()) { innerPadding ->
                    Greeting(
                        name = "World",
                        modifier = Modifier.padding(innerPadding)
                    )
                }
            }
        }
    }
```

```
}

@Composable
fun Greeting(name: String, modifier: Modifier = Modifier) {
    Text(
        text = "Hello $name!",
        modifier = modifier
    )
}

@Preview(showBackground = true)
@Composable
fun GreetingPreview() {
    HelloWorldTheme {
        Greeting("World")
    }
}
```

layout.xml

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

</LinearLayout>
```

Program-2 Write an android program for button.

MainActivity.kt

```
package com.example.firstapp

import android.os.Bundle
import android.widget.Toast
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity
import androidx.core.view.ViewCompat
import androidx.core.view.WindowInsetsCompat
import android.view.View

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {



        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContentView(R.layout.activity_main)
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main)) {
v, insets ->
            val systemBars =
insets.getInsets(WindowInsetsCompat.Type.systemBars())
            v.setPadding(systemBars.left, systemBars.top, systemBars.right,
```

```
systemBars.bottom)
            insets
        }
    }

    fun onSubmit(view: View){

        Toast.makeText(this,"You have clicked clickme
Button",Toast.LENGTH_LONG).show()

    }

}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/btn1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:onClick="onSubmit"
        android:text="CLICKME"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.459" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Program-3 Write a program for Edittext

MainActivity.kt

```
package com.example.demoapp

import android.os.Bundle
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity
import androidx.core.view.ViewCompat
import androidx.core.view.WindowInsetsCompat
import android.view.View
import android.widget.EditText
import android.widget.Toast

class MainActivity : AppCompatActivity() {
```

```
    lateinit var editText: EditText
    lateinit var string: String

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContentView(R.layout.activity_main)
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main)) {
v, insets ->
            val systemBars =
insets.getInsets(WindowInsetsCompat.Type.systemBars())
            v.setPadding(systemBars.left, systemBars.top, systemBars.right,
systemBars.bottom)
            insets
        }
    }

    fun onSubmit(view: View){

        editText= findViewById(R.id.EditTextName)
        string = editText.text.toString()

        Toast.makeText(this,string,Toast.LENGTH_LONG).show()


    }

}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/EditTextName"
        android:layout_width="48dp"
        android:layout_height="48dp"
        android:ems="10"
        android:inputType="text"
        android:hint="Enter your text here"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.442"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.144" />
```

```
    <Button
        android:id="@+id/BtnSubmit"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:onClick="onSubmit"
        android:text="Submit"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.284" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Program-4 Write a program for arithmetic app.

MainActivity.kt

```
package com.example.arithmeticapp

import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
import androidx.appcompat.app.AppCompatActivity
import com.example.calculationapp.R

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // Get references to UI elements
        val num1EditText = findViewById<EditText>(R.id.num1)
        val num2EditText = findViewById<EditText>(R.id.num2)
        val resultTextView = findViewById<TextView>(R.id.result)

        // Define the buttons for operations
        val addButton = findViewById<Button>(R.id.addButton)
        val subButton = findViewById<Button>(R.id.subButton)
        val mulButton = findViewById<Button>(R.id.mulButton)
        val divButton = findViewById<Button>(R.id.divButton)

        // Set click listeners for buttons
        addButton.setOnClickListener {
            performOperation(num1EditText, num2EditText, resultTextView,
"add")
        }

        subButton.setOnClickListener {
            performOperation(num1EditText, num2EditText, resultTextView,
"subtract")
        }

        mulButton.setOnClickListener {
            performOperation(num1EditText, num2EditText, resultTextView,
```

```
"multiply")
        }

        divButton.setOnClickListener {
            performOperation(num1EditText, num2EditText, resultTextView,
"divide")
        }
    }

    // Function to perform operations
    private fun performOperation(num1EditText: EditText, num2EditText:
EditText, resultTextView: TextView, operation: String) {
        // Get the text from EditTexts
        val num1 = num1EditText.text.toString().toDoubleOrNull()
        val num2 = num2EditText.text.toString().toDoubleOrNull()

        if (num1 != null && num2 != null) {
            var result = 0.0
            when (operation) {
                "add" -> result = num1 + num2
                "subtract" -> result = num1 - num2
                "multiply" -> result = num1 * num2
                "divide" -> if (num2 != 0.0) result = num1 / num2 else
resultTextView.text = "Cannot divide by zero"
            }
            resultTextView.text = "Result: $result"
        } else {
            resultTextView.text = "Please enter valid numbers"
        }
    }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
    android:orientation="vertical"
    android:padding="16dp">

    <!-- Adding padding -->


    <EditText
        android:id="@+id/num1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"
        android:hint="Enter first number"
        android:inputType="numberDecimal"
        android:padding="16dp"
        android:textSize="18sp" />

    <EditText
```

```
        android:id="@+id/num2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"
        android:hint="Enter second number"
        android:inputType="numberDecimal"
        android:padding="16dp"
        android:textSize="18sp" /> <!-- Adding padding -->


    <TextView
        android:id="@+id/result"
        android:layout_width="match_parent"
        android:layout_height="63dp"
        android:layout_marginTop="16dp"
        android:text="Result: "
        android:textAlignment="center"
        android:textSize="20sp" />

    <Button
        android:id="@+id/addButton"
        android:layout_width="141dp"
        android:layout_height="wrap_content"
        android:text="Add"
        android:textSize="18sp" />

    <Button
        android:id="@+id/subButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="16dp"
        android:text="Subtract"
        android:textSize="18sp" />

    <Button
        android:id="@+id/mulButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="16dp"
        android:text="Multiply"
        android:textSize="18sp" />

    <Button
        android:id="@+id/divButton"
        android:layout_width="104dp"
        android:layout_height="wrap_content"
        android:layout_marginLeft="16dp"
        android:text="Divide"
        android:textSize="18sp" />

    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="32dp"
        android:gravity="center"
        android:orientation="horizontal">
```

```
    </RelativeLayout>

</LinearLayout>
```

Program-5 : Write a program for ImageView.

MainActivity.kt

```
package com.example.imageviewapp

import android.os.Bundle
import android.widget.ImageView
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // Use findViewById to get the ImageView
        val imageView: ImageView = findViewById(R.id.imageView)

        // Set the star image from the system drawable
        imageView.setImageResource(android.R.drawable.btn_star_big_on)
    }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">


    <ImageView
        android:id="@+id/imageView"
        android:layout_width="268dp"
        android:layout_height="326dp"
        android:layout_marginStart="100dp"
        android:layout_marginTop="48dp"
        android:contentDescription="Star"
        android:src="@android:drawable/btn_star_big_on"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

Program-6 Write a program for option button.

MainActivity.kt

```
package com.example.radiobuttonapp

import android.os.Bundle
import android.widget.RadioButton
import android.widget.RadioGroup
import android.widget.TextView
import androidx.appcompat.app.AppCompatActivity
//import kotlinx.android.synthetic.main.activity_main.*

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // Find the RadioGroup and TextView by their IDs
        val radioGroup: RadioGroup = findViewById(R.id.radioGroup)
        val resultText: TextView = findViewById(R.id.resultText)

        // Set a listener for the RadioGroup
        radioGroup.setOnCheckedChangeListener { group, checkedId ->
            // Get the selected RadioButton by ID
            val selectedRadioButton: RadioButton = findViewById(checkedId)
            // Set the text of the TextView to show the selected option
            resultText.text = "Selected: ${selectedRadioButton.text}"
        }
    }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <!-- RadioGroup to group RadioButtons -->
    <RadioGroup
        android:id="@+id/radioGroup"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        android:layout_centerInParent="true">
```

```
        <!-- First RadioButton -->
        <RadioButton
            android:id="@+id/radioButton1"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Option 1" />

        <!-- Second RadioButton -->
        <RadioButton
            android:id="@+id/radioButton2"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Option 2" />

    </RadioGroup>

    <!-- TextView to display the selected radio button -->
    <TextView
        android:id="@+id/resultText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Select an option"
        android:layout_marginTop="32dp"
        app:layout_constraintTop_toBottomOf="@+id/radioGroup"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

Program-7 Write a program for Listview.

MainActivity.kt

```
package com.example.listviewapp

import android.os.Bundle
import android.widget.ArrayAdapter
import android.widget.ListView
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // List of data to display in ListView
        val items = arrayOf("Item 1", "Item 2", "Item 3", "Item 4", "Item 5")

        // Find the ListView by ID
        val listView: ListView = findViewById(R.id.listView)

        // Create an ArrayAdapter to bind the data to the ListView
        val adapter = ArrayAdapter(this, android.R.layout.simple_list_item_1,
items)
```

```
        // Set the adapter to the ListView
        listView.adapter = adapter
    }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <!-- ListView to display the items -->
    <ListView
        android:id="@+id/listView"
        android:layout_width="0dp"
        android:layout_height="0dp"
        android:layout_marginTop="16dp"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```