CS – 31 Mobile Application Development in Android using Kotlin

BCA Semester – 6

Journal

H & H Kotak Institute of Science, Rajkot

BCA Department

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Laboratory Certificate

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Mobile Application Development in Android using Kotlin during the academic year

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Subject In-Charge

_____
Head of the Department

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Unit-1

Introduction to Kotlin Programming

1. Hello World Program

```
1   /*Hello World Program*/
2
3   fun main() {
4       println("Hello World")
5       print("Hello ")
6       print("World")
7   }
```

2. Mutable variable

```
1   //Mutable Variable in Kotlin
2   fun main() {
3       var name = "Java Programing"
4       println("Name = $name")
5
6       name = "Kotlin Progaming"
7       println("Name = $name")
8   }
```

3. Basic data types

```
1    //Basic data types in kotlin
2
3    fun main(args: Array<String>) {
4        val a: Int = 10000
5        val d: Double = 100.00
6        val f: Float = 100.00f
7        val l: Long = 1000000004
8        val s: Short = 10
9        val b: Byte = 1
10       val letter: Char = 'A'
11       val strVar: String="Kotlin"
12
13       println("Int Value is $a")
14       println("Double  Value is $d")
15       println("Float Value is $f")
16       println("Long Value is $l"  )
17       println("Short Value is $s")
18       println("Byte Value is $b")
19       println("Char Value is $letter")
20       println("String Value = $strVar")
21   }
```

4. Use of Array

```
1   //Array data type in kotlin
2
3   fun main(args: Array<String>) {
4       val numbers: IntArray = intArrayOf(10, 20, 30, 40, 50)
5       println("Value at 3rd position : " + numbers[2])
6   }
```

5. Arithmatic Operators

```
1   //Arithmatic Operators in Kotlin
2
3   fun main() {
4       var a: Int=10
5       var b: Int=20
6       println("a+b= " + (a+b))
```

```
7     println("a-b= " + (a-b))
8     println("a*b= " + (a*b))
9     println("a/b= " + (a/b))
10    println("a%b= " + (a%b))
11 }
```

6. UDF

```
1  //Kotlin UDF.
2  fun main(args: Array<String>) {
3      printHello()
4  }
5
6  fun printHello(){
7      println("Hello, World!")
8  }
```

7. Passing parameters and returning value by UDF

```
1  //Parameter pass into function and return value.
2
3  fun main(args: Array<String>) {
4      val a = 10
5      val b = 20
6
7      val result = sumTwo(a, b)
8      println( result )
9
10 }
11
12 fun sumTwo(a:Int, b:Int):Int{
13     val x = a + b
14
15     return x
16 }
```

8. Function recursion

```
1  //Function recursion in Kotlin
2
3  fun main(args: Array<String>) {
4      val a = 4
5
6      val result = factorial(a)
7      println( result )
8  }
9
10 fun factorial(a:Int):Int{
11     val result:Int
12
13     if( a <= 1){
14         result = a
15     }else{
16         result = a*factorial(a-1)
17     }
18     return result
19 }
```

9. Range in Kotlin

```
1   //when loop with range.
2
3   fun main(args: Array<String>) {
4       val day = 2
5       when (day) {
6         in 1..5 -> println("Weekday")
7         else -> println("Weekend")
8       }
9   }
```

10. if returning value

```
1   //if returning value.
2
3   fun main(args: Array<String>) {
4       val age:Int = 10
5
6       val result = if (age > 18) {
7           "Adult"
8       } else {
9           "Minor"
10      }
11      println(result)
12  }
```

11. for loop with array

```
1   //for loop with array.
2
3   fun main(args: Array<String>) {
4       var fruits = arrayOf("Orange", "Apple", "Mango", "Banana")
5
6       for (item in fruits) {
7           println(item)
8       }
9   }
```

12. Break and Continue

```
1   //use of Break and Continue.
2
3   fun main(){
4       var a: Int = 0
5       while(true) {
6           a++
7           if(a%2==0) continue
8           if(a>10) break
9           println(a)
10      }
11  }
```

13. List Collection

```
1   //Creating and Display List (Collection).
2
3   fun main() {
4       val theList =  mutableListOf("one", "two", "three", "four")
5       theList.add("five")
6       println(theList.toString())
7   }
```

14. Set Collection

```
1   //Creating and Display Sets (Collection).
2
3   fun main() {
4       val theSet = mutableSetOf("one", "two", "three", "four")
5       theSet.add("five")
6       println(theSet.sorted())
7   }
```

15. Map Collection

```
1    //Creating and Display Map (Collection).
2
3    fun main() {
4        val theMap = mapOf(Pair("one", 1), Pair("two", 2),
5    Pair("three", 3))
6        //val theMap = mapOf(Pair("one", 1), Pair("two", 2),
7    Pair("three", 3))
8        println(theMap)
9        println("Entries: " + theMap.entries)
10       println("Keys:" + theMap.keys)
11       println("Values:" + theMap.values)
12   }
```

16. Class and Objects

```
1    //Class and Object in Kotlin
2
3    class myClass {
4        // Property (data member)
5        private var name: String = "Kotlin Programing"
6
7        // Member function
8        fun printMe() {
9            print("New Programing Language - " + name)
10       }
11   }
12   fun main(args: Array<String>) {
13       val obj = myClass() // Create object obj of myClass class
14       obj.printMe() // Call a member function using object
15   }
```

17. Constructor

```
1    //Constructor in Kotlin
2
3    class Person{
4        // Member Variables
5        var name: String
6        var age: Int
7
8        // Initializer Block
9        init {
10           println("Initializer Block")
11       }
12
13       // Secondary Constructor
14       constructor ( _name: String, _age: Int) {
15           this.name = _name
```

```
16          this.age = _age
17          println("Name = $name")
18          println("Age = $age")
19      }
20  }
21
22  fun main(args: Array<String>) {
23      val zara = Person("Malay Dave", 40)
24  }
```

18. Inheritance

```
1   //Inheritance in Kotlin
2
3   open class ABC {
4       open fun think () {
5           print("Hey!! i am thinking ")
6       }
7   }
8   class BCD: ABC() { // inheritance happens using default
9   constructor
10      override fun think() {
11          print("I Am from Child")
12      }
13  }
14  fun main(args: Array<String>) {
15      var  a = BCD()
16      a.think()
17  }
```

19. Visibility Modes

```
1   //Protected Visibility Control in Kotlin
2
3   open class A() {
4       protected val i = 1
5   }
6   class B : A() {
7       fun getValue() : Int {
8           return i
9       }
10  }
11
12  fun main() {
13      var obj = B()
14      println(obj.getValue())
15  }
```

20. Exception Handling

```
1   //Exception Handling in Kotlin
2
3   fun main(args: Array<String>) {
4       try {
5           val myVar:Int = 12;
6           val v:String = "Kotlin Programing";
7           v.toInt();
8       } catch(e:Exception) {
9           e.printStackTrace();
10      } finally {
```

```
11          println("Exception Handeling in Kotlin");
12      }
13 }
```

Unit – 2

Introduction to Android &

Android Application Design

21. Hello World in Android

```
activity_main.xml
-----------------
```

```
1   <?xml version="1.0" encoding="utf-8"?>
2   <androidx.constraintlayout.widget.ConstraintLayout
3   xmlns:android="http://schemas.android.com/apk/res/android"
4       xmlns:app="http://schemas.android.com/apk/res-auto"
5       xmlns:tools="http://schemas.android.com/tools"
6       android:layout_width="match_parent"
7       android:layout_height="match_parent"
8       tools:context=".MainActivity">
9
10      <TextView
11          android:layout_width="wrap_content"
12          android:layout_height="wrap_content"
13          android:text="@string/hello"
14          android:textSize="24sp"
15          app:layout_constraintBottom_toBottomOf="parent"
16          app:layout_constraintEnd_toEndOf="parent"
17          app:layout_constraintStart_toStartOf="parent"
18          app:layout_constraintTop_toTopOf="parent" />
19
20  </androidx.constraintlayout.widget.ConstraintLayout>
```

```
------------------------------------------------------------------
MainActivity.kt
---------------
```

```
1   package com.example.helloworldkotlin
2
3   import androidx.appcompat.app.AppCompatActivity
4   import android.os.Bundle
5
6   class MainActivity : AppCompatActivity() {
7       override fun onCreate(savedInstanceState: Bundle?) {
8           super.onCreate(savedInstanceState)
9           setContentView(R.layout.activity_main)
10      }
11  }
```

```
------------------------------------------------------------------
Strings.xml
-----------
```

```
1   <resources>
2       <string name="app_name">HelloWorldKotlin</string>
3       <string name="hello">Hello World</string>
4   </resources>
```

22. Acitivity Life Cycle

```
activity_main.xml
-----------------
1  <?xml version="1.0" encoding="utf-8"?>
2  <androidx.constraintlayout.widget.ConstraintLayout
3  xmlns:android="http://schemas.android.com/apk/res/android"
4      xmlns:app="http://schemas.android.com/apk/res-auto"
5      xmlns:tools="http://schemas.android.com/tools"
6      android:layout_width="match_parent"
7      android:layout_height="match_parent"
8      tools:context=".MainActivity"/>
   ----------------------------------------------------------------
MainActivity.kt
---------------
1  package com.example.activitylifecyclekotlin
2
3  import androidx.appcompat.app.AppCompatActivity
4  import android.os.Bundle
5  import android.util.Log
6
7  class MainActivity : AppCompatActivity() {
8      override fun onCreate(savedInstanceState: Bundle?) {
9          super.onCreate(savedInstanceState)
10         setContentView(R.layout.activity_main)
11         print("onCreate")
12     }
13
14     override fun onStart() {
15         super.onStart()
16         print("onStart")
17     }
18
19     override fun onResume() {
20         super.onResume()
21         print("onResume")
22     }
23
24     override fun onPause() {
25         super.onPause()
26         print("onPause")
27     }
28
```

```
29      override fun onStop() {
30          super.onStop()
31          print("onStop")
32      }
33
34      override fun onRestart() {
35          super.onRestart()
36          print("onRestart")
37      }
38
39      override fun onDestroy() {
40          super.onDestroy()
41          print("onDestroy")
42      }
43
44      fun print(msg: String){
45          Log.d("Activity State ",msg)
46      }
47
48  }
```
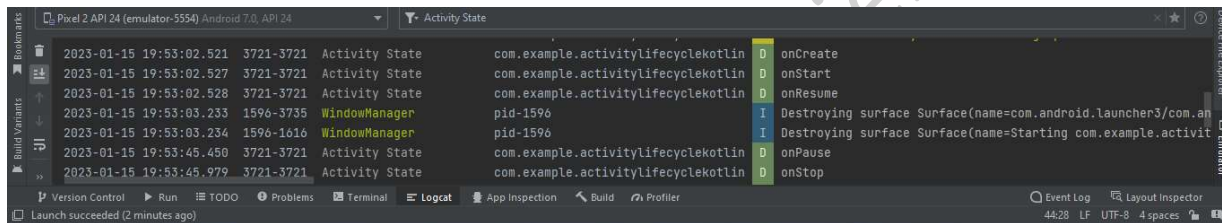
Unit – 3

Android User Interface Design

23. EditText and Toast

```
activity_main.xml
-----------------
1    <?xml version="1.0" encoding="utf-8"?>
2    <androidx.constraintlayout.widget.ConstraintLayout
3    xmlns:android="http://schemas.android.com/apk/res/android"
4        xmlns:app="http://schemas.android.com/apk/res-auto"
5        xmlns:tools="http://schemas.android.com/tools"
6        android:layout_width="match_parent"
7        android:layout_height="match_parent"
8        tools:context=".MainActivity">
9
10       <EditText
11           android:id="@+id/editTextTextPersonName2"
12           android:layout_width="wrap_content"
13           android:layout_height="wrap_content"
14           android:layout_marginStart="156dp"
15           android:ems="10"
16           android:inputType="textPersonName"
17           android:textAlignment="textStart"
18           app:layout_constraintStart_toStartOf="parent"
19           tools:ignore="MissingConstraints"
20           tools:layout_editor_absoluteY="68dp" />
21
22       <Button
23           android:id="@+id/button2"
24           android:layout_width="wrap_content"
25           android:layout_height="wrap_content"
26           android:layout_marginTop="32dp"
27           android:text="Show Text"
28           app:layout_constraintEnd_toEndOf="parent"
29           app:layout_constraintHorizontal_bias="0.498"
30           app:layout_constraintStart_toStartOf="parent"
31           app:layout_constraintTop_toBottomOf="@+id/editTextTextPersonName2" />
32
33       <TextView
34           android:id="@+id/textView"
35           android:layout_width="wrap_content"
36           android:layout_height="wrap_content"
37           android:text="Enter Text:"
38           android:textSize="24sp"
39           tools:layout_editor_absoluteX="16dp"
40           tools:layout_editor_absoluteY="68dp"
41           tools:ignore="MissingConstraints" />
42
43
44   </androidx.constraintlayout.widget.ConstraintLayout>
     -----------------------------------------------------------------
     MainActivity.kt
     ----------------
1    package com.example.helloworld
2
3    import androidx.appcompat.app.AppCompatActivity
4    import android.os.Bundle
5    import android.widget.Button;
6    import android.view.View;
7    import android.widget.EditText;
8    import android.widget.Toast;
9
10   class MainActivity : AppCompatActivity() {
11
12       override fun onCreate(savedInstanceState: Bundle?) {
13           super.onCreate(savedInstanceState)
```
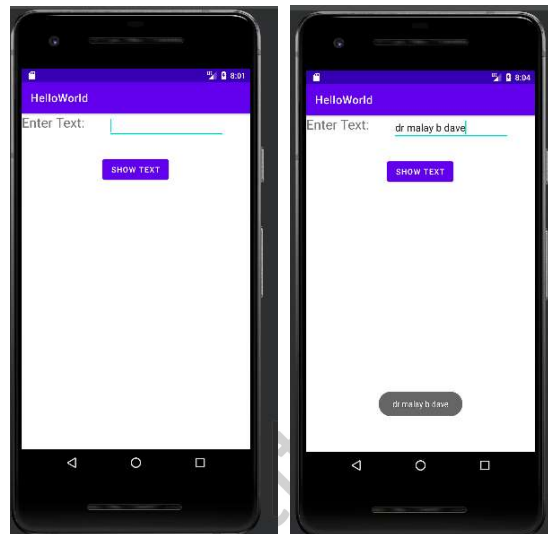
```
14          setContentView(R.layout.activity_main)
15
16          val but1 = findViewById<Button>(R.id.button2);
17          val txt1 = findViewById<EditText>(R.id.editTextTextPersonName2);
18
19          but1.setOnClickListener {
20
21  Toast.makeText(applicationContext,txt1.text.toString(),Toast.LENGTH_LONG).show()
22          }
23      }
24  }
```
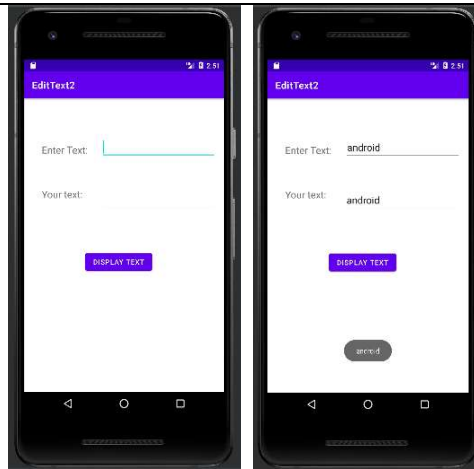

24. Two EditText and Toast

```
activity_main.xml
-----------------
1   <?xml version="1.0" encoding="utf-8"?>
2   <androidx.constraintlayout.widget.ConstraintLayout
3   xmlns:android="http://schemas.android.com/apk/res/android"
4       xmlns:app="http://schemas.android.com/apk/res-auto"
5       xmlns:tools="http://schemas.android.com/tools"
6       android:layout_width="match_parent"
7       android:layout_height="match_parent"
8       tools:context=".MainActivity">
9
10      <TextView
11          android:id="@+id/textView"
12          android:layout_width="wrap_content"
13          android:layout_height="wrap_content"
14          android:layout_marginStart="36dp"
15          android:layout_marginTop="92dp"
16          android:text="Enter Text:"
17          android:textSize="20sp"
18          app:layout_constraintStart_toStartOf="parent"
19          app:layout_constraintTop_toTopOf="parent" />
20
21      <EditText
22          android:id="@+id/editTextTextPersonName"
23          android:layout_width="wrap_content"
24          android:layout_height="wrap_content"
25          android:layout_marginStart="28dp"
26          android:layout_marginTop="76dp"
27          android:ems="10"
28          android:inputType="textPersonName"
```

```
29          android:textSize="20sp"
30          app:layout_constraintStart_toEndOf="@+id/textView"
31          app:layout_constraintTop_toTopOf="parent" />
32
33      <TextView
34          android:id="@+id/textView2"
35          android:layout_width="98dp"
36          android:layout_height="34dp"
37          android:layout_marginStart="36dp"
38          android:layout_marginTop="64dp"
39          android:text="Your text:"
40          android:textSize="20sp"
41          app:layout_constraintStart_toStartOf="parent"
42          app:layout_constraintTop_toBottomOf="@+id/textView" />
43      <EditText
44          android:id="@+id/editTextTextPersonName2"
45          android:layout_width="wrap_content"
46          android:layout_height="wrap_content"
47          android:layout_marginStart="24dp"
48          android:layout_marginTop="60dp"
49          android:ems="10"
50          android:inputType="textPersonName"
51          android:textSize="20sp"
52          app:layout_constraintStart_toEndOf="@+id/textView2"
53          app:layout_constraintTop_toBottomOf="@+id/editTextTextPersonName" />
54      <Button
55          android:id="@+id/button"
56          android:layout_width="wrap_content"
57          android:layout_height="wrap_content"
58          android:layout_marginTop="312dp"
59          android:text="Display Text"
60          app:layout_constraintEnd_toEndOf="parent"
61          app:layout_constraintHorizontal_bias="0.46"
62          app:layout_constraintStart_toStartOf="parent"
63          app:layout_constraintTop_toTopOf="parent" />
64  </androidx.constraintlayout.widget.ConstraintLayout>
65  ----------------------------------------------------------------
66  MainActivity.kt
    ----------------
    package com.example.edittext2

1   import androidx.appcompat.app.AppCompatActivity
2   import android.os.Bundle
3   import android.widget.Button
4   import android.widget.EditText
5   import android.widget.Toast
6
7   class MainActivity : AppCompatActivity() {
8       override fun onCreate(savedInstanceState: Bundle?) {
9           super.onCreate(savedInstanceState)
10          setContentView(R.layout.activity_main)
11          val text1 = findViewById<EditText>(R.id.editTextTextPersonName)
12          val text2 = findViewById<EditText>(R.id.editTextTextPersonName2)
13          val but1=findViewById<Button>(R.id.button)
14
15          but1.setOnClickListener {
16              text2.setText(text1.text.toString())
17
18  Toast.makeText(applicationContext,text1.text.toString(),Toast.LENGTH_LONG).show()
19          }
20      }
21  }
```

25. Check Box

```
activity_main.xml
-----------------
1   <?xml version="1.0" encoding="utf-8"?>
2   <androidx.constraintlayout.widget.ConstraintLayout
3   xmlns:android="http://schemas.android.com/apk/res/android"
4       xmlns:app="http://schemas.android.com/apk/res-auto"
5       xmlns:tools="http://schemas.android.com/tools"
6       android:layout_width="match_parent"
7       android:layout_height="match_parent"
8       tools:context=".MainActivity">
9
10      <TextView
11          android:id="@+id/textView"
12          android:layout_width="wrap_content"
13          android:layout_height="wrap_content"
14          android:text="Select Item(s):"
15          android:textSize="24sp"
16          app:layout_constraintBottom_toBottomOf="parent"
17          app:layout_constraintEnd_toEndOf="parent"
18          app:layout_constraintStart_toStartOf="parent"
19          app:layout_constraintTop_toTopOf="parent"
20          app:layout_constraintVertical_bias="0.14" />
21
22      <LinearLayout
23          android:layout_width="315dp"
24          android:layout_height="160dp"
25          android:layout_marginTop="160dp"
26          android:orientation="vertical"
27          app:layout_constraintEnd_toEndOf="parent"
28          app:layout_constraintStart_toStartOf="parent"
29          app:layout_constraintTop_toTopOf="parent">
30
31          <CheckBox
32              android:id="@+id/chkPizza"
33              android:layout_width="wrap_content"
34              android:layout_height="wrap_content"
35              android:text="Pizza"
36              android:textSize="24sp" />
37
38          <CheckBox
39              android:id="@+id/chkHotDog"
40              android:layout_width="wrap_content"
41              android:layout_height="wrap_content"
42              android:text="Hot Dog"
43              android:textSize="24sp" />
```
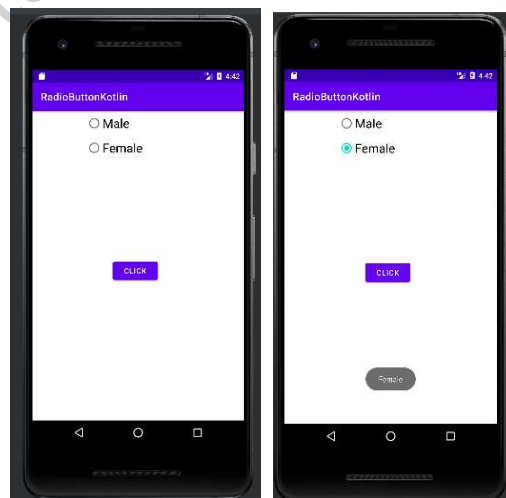
```
44
45        <CheckBox
46            android:id="@+id/chkBurgur"
47            android:layout_width="wrap_content"
48            android:layout_height="wrap_content"
49            android:text="Burgur"
50            android:textSize="24sp" />
51
52    </LinearLayout>
53
54    <Button
55        android:id="@+id/button"
56        android:layout_width="wrap_content"
57        android:layout_height="wrap_content"
58        android:layout_marginTop="380dp"
59        android:text="Gnerate Bill"
60        app:layout_constraintEnd_toEndOf="parent"
61        app:layout_constraintHorizontal_bias="0.498"
62        app:layout_constraintStart_toStartOf="parent"
63        app:layout_constraintTop_toTopOf="parent" />
64
65 </androidx.constraintlayout.widget.ConstraintLayout>
   ----------------------------------------------------------------
   MainActivity.kt
   ----------------
1  package com.example.checkboxkotlin
2
3  import android.os.Bundle
4  import android.widget.Button
5  import android.widget.CheckBox
6  import android.widget.Toast
7  import androidx.appcompat.app.AppCompatActivity
8
9  class MainActivity : AppCompatActivity() {
10     override fun onCreate(savedInstanceState: Bundle?) {
11         super.onCreate(savedInstanceState)
12         setContentView(R.layout.activity_main)
13
14         val p=findViewById<CheckBox>(R.id.chkPizza)
15         val h=findViewById<CheckBox>(R.id.chkHotDog)
16         val b=findViewById<CheckBox>(R.id.chkBurgur)
17         val g=findViewById<Button>(R.id.button)
18
19         g.setOnClickListener {
20
21             var totalamount = 0
22             var result = StringBuilder()
23             result.append("Selected Items:")
24             if(p.isChecked()){
25                 result.append("\nPizza 100Rs")
26                 totalamount+=100
27             }
28             if(h.isChecked()){
29                 result.append("\nHot Dog 80Rs")
30                 totalamount+=80
31             }
32             if(b.isChecked()){
33                 result.append("\nBurgur 50Rs")
34                 totalamount+=50
35             }
36             result.append("\nTotal: "+totalamount+"Rs")
37             Toast.makeText(applicationContext, result.toString(),
38 Toast.LENGTH_LONG).show()
```

```
39          }
40       }
41 }
```
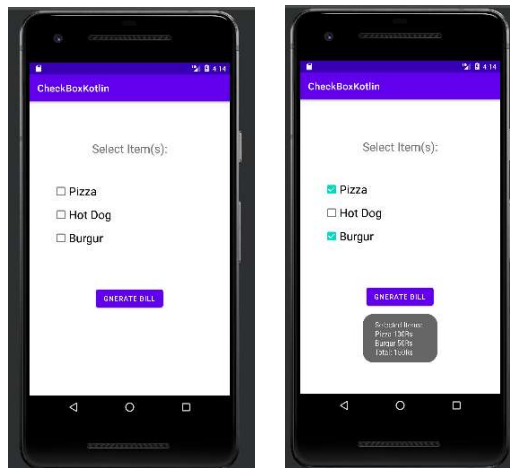

26. Radio Button

```
     activity_main.xml
     -----------------
1    <?xml version="1.0" encoding="utf-8"?>
2    <androidx.constraintlayout.widget.ConstraintLayout
3    xmlns:android="http://schemas.android.com/apk/res/android"
4        xmlns:app="http://schemas.android.com/apk/res-auto"
5        xmlns:tools="http://schemas.android.com/tools"
6        android:layout_width="match_parent"
7        android:layout_height="match_parent"
8        tools:context=".MainActivity">
9
10       <RadioGroup
11           android:id="@+id/radioGroup"
12           android:layout_width="203dp"
13           android:layout_height="115dp"
14           app:layout_constraintEnd_toEndOf="parent"
15           app:layout_constraintStart_toStartOf="parent"
16           tools:layout_editor_absoluteY="90dp">
17
18           <RadioButton
19               android:id="@+id/radioButton"
20               android:layout_width="match_parent"
21               android:layout_height="wrap_content"
22               android:text="Male"
23               android:textSize="24sp" />
24
25           <RadioButton
26               android:id="@+id/radioButton2"
27               android:layout_width="match_parent"
28               android:layout_height="wrap_content"
29               android:text="Female"
30               android:textSize="24sp" />
31       </RadioGroup>
32
33       <Button
34           android:id="@+id/button"
35           android:layout_width="wrap_content"
36           android:layout_height="wrap_content"
37           android:layout_marginStart="156dp"
38           android:layout_marginTop="288dp"
39           android:text="Click"
```

```
40          app:layout_constraintStart_toStartOf="parent"
41          app:layout_constraintTop_toTopOf="parent" />
42  </androidx.constraintlayout.widget.ConstraintLayout>
    ----------------------------------------------------------------
    MainActivity.kt
    ----------------
1   package com.example.radiobuttonkotlin
2
3   import androidx.appcompat.app.AppCompatActivity
4   import android.os.Bundle
5   import android.widget.Button
6   import android.widget.RadioButton
7   import android.widget.RadioGroup
8   import android.widget.Toast
9
10  class MainActivity : AppCompatActivity() {
11      override fun onCreate(savedInstanceState: Bundle?) {
12          super.onCreate(savedInstanceState)
13          setContentView(R.layout.activity_main)
14
15          val radioGroup=findViewById<RadioGroup>(R.id.radioGroup)
16          val button=findViewById<Button>(R.id.button)
17
18          button.setOnClickListener {
19              var selectedId:Int = radioGroup.getCheckedRadioButtonId()
20              var generatedButton = findViewById<RadioButton>(selectedId)
21              if (selectedId==-1)
22              {
23                  Toast.makeText(applicationContext,"Nothing selected",
24  Toast.LENGTH_SHORT).show()
25              }
26              else
27              {
28
29  Toast.makeText(applicationContext,generatedButton.text.toString(),
    Toast.LENGTH_SHORT).show()
30              }
31          }
32      }
33  }
```

27. Spinner

```
activity_main.xml
-----------------
1   <?xml version="1.0" encoding="utf-8"?>
2   <androidx.constraintlayout.widget.ConstraintLayout
3   xmlns:android="http://schemas.android.com/apk/res/android"
4       xmlns:app="http://schemas.android.com/apk/res-auto"
5       xmlns:tools="http://schemas.android.com/tools"
6       android:layout_width="match_parent"
7       android:layout_height="match_parent"
8       tools:context=".MainActivity">
9
10      <TextView
11          android:id="@+id/textView"
12          android:layout_width="wrap_content"
13          android:layout_height="wrap_content"
14          android:text="Select Languages:"
15          app:layout_constraintBottom_toBottomOf="parent"
16          app:layout_constraintEnd_toEndOf="parent"
17          app:layout_constraintStart_toStartOf="parent"
18          app:layout_constraintTop_toTopOf="parent"
19          app:layout_constraintVertical_bias="0.195" />
20
21      <Spinner
22          android:id="@+id/spinner"
23          android:layout_width="wrap_content"
24          android:layout_height="wrap_content"
25          android:layout_marginTop="76dp"
26          app:layout_constraintEnd_toEndOf="parent"
27          app:layout_constraintStart_toStartOf="parent"
28          app:layout_constraintTop_toBottomOf="@+id/textView" />
29
30  </androidx.constraintlayout.widget.ConstraintLayout>
    ----------------------------------------------------------------
    strings.xml
    -----------
1   <resources>
2       <string name="app_name">SpinnerKotlin</string>
3       <string-array name="Languages">
4           <item>Java</item>
5           <item>Kotlin</item>
6           <item>Swift</item>
7           <item>Python</item>
8           <item>Scala</item>
9           <item>Perl</item>
10      </string-array>
11  </resources>
    ----------------------------------------------------------------
    MainActivity.kt
    ----------------
1   package com.example.spinnerkotlin
2
3   import androidx.appcompat.app.AppCompatActivity
4   import android.os.Bundle
5   import android.view.View
6   import android.widget.AdapterView
7   import android.widget.ArrayAdapter
8   import android.widget.Spinner
9   import android.widget.Toast
10
11  class MainActivity : AppCompatActivity() {
12      override fun onCreate(savedInstanceState: Bundle?) {
13          super.onCreate(savedInstanceState)
```

```
14          setContentView(R.layout.activity_main)
15
16          val languages = resources.getStringArray(R.array.Languages)
17
18          // access the spinner
19          val spinner = findViewById<Spinner>(R.id.spinner)
20          if (spinner != null) {
21              val adapter = ArrayAdapter(this,
22                  android.R.layout.simple_spinner_item, languages)
23              spinner.adapter = adapter
24
25              spinner.onItemSelectedListener = object :
26                  AdapterView.OnItemSelectedListener {
27                  override fun onItemSelected(parent: AdapterView<*>,
28                                              view: View, position: Int, id: Long)
   {
29                      Toast.makeText(this@MainActivity,
                            "Language: " +
                                "" + languages[position],
   Toast.LENGTH_SHORT).show()
                      }
30
31                  override fun onNothingSelected(parent: AdapterView<*>) {
32                      // write code to perform some action
33                  }
34              }
35          }
36      }
37 }
```


28. Explcit Intent

```
activity_main.xml
-----------------
1   <?xml version="1.0" encoding="utf-8"?>
2   <androidx.constraintlayout.widget.ConstraintLayout
3   xmlns:android="http://schemas.android.com/apk/res/android"
4       xmlns:app="http://schemas.android.com/apk/res-auto"
5       xmlns:tools="http://schemas.android.com/tools"
6       android:layout_width="match_parent"
7       android:layout_height="match_parent"
8       tools:context=".MainActivity">
9
10      <TextView
```

```
11          android:id="@+id/textView"
12          android:layout_width="wrap_content"
13          android:layout_height="wrap_content"
14          android:text="First Activity"
15          android:textSize="24sp"
16          app:layout_constraintBottom_toBottomOf="parent"
17          app:layout_constraintEnd_toEndOf="parent"
18          app:layout_constraintStart_toStartOf="parent"
19          app:layout_constraintTop_toTopOf="parent" />
20
21      <Button
22          android:id="@+id/button"
23          android:layout_width="wrap_content"
24          android:layout_height="wrap_content"
25          android:layout_marginTop="52dp"
26          android:text="Next"
27          app:layout_constraintEnd_toEndOf="parent"
28          app:layout_constraintHorizontal_bias="0.498"
29          app:layout_constraintStart_toStartOf="parent"
30          app:layout_constraintTop_toBottomOf="@+id/textView" />
31
32  </androidx.constraintlayout.widget.ConstraintLayout>
    ----------------------------------------------------------------
    activity_main2.xml
    ------------------
1   <?xml version="1.0" encoding="utf-8"?>
2   <androidx.constraintlayout.widget.ConstraintLayout
3   xmlns:android="http://schemas.android.com/apk/res/android"
4       xmlns:app="http://schemas.android.com/apk/res-auto"
5       xmlns:tools="http://schemas.android.com/tools"
6       android:layout_width="match_parent"
7       android:layout_height="match_parent"
8       tools:context=".MainActivity2">
9
10      <TextView
11          android:id="@+id/textView2"
12          android:layout_width="wrap_content"
13          android:layout_height="wrap_content"
14          android:text="Second Activity"
15          android:textSize="24sp"
16          app:layout_constraintBottom_toBottomOf="parent"
17          app:layout_constraintEnd_toEndOf="parent"
18          app:layout_constraintStart_toStartOf="parent"
19          app:layout_constraintTop_toTopOf="parent" />
20
21      <Button
22          android:id="@+id/button2"
23          android:layout_width="wrap_content"
24          android:layout_height="wrap_content"
25          android:layout_marginTop="56dp"
26          android:text="Previous"
27          app:layout_constraintEnd_toEndOf="parent"
28          app:layout_constraintHorizontal_bias="0.498"
29          app:layout_constraintStart_toStartOf="parent"
30          app:layout_constraintTop_toBottomOf="@+id/textView2" />
31  </androidx.constraintlayout.widget.ConstraintLayout>
    ----------------------------------------------------------------
    MainActivity.kt
    ----------------
1   package com.example.intentdemo;
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.widget.Button;
9  |
10 | public class MainActivity extends AppCompatActivity {
11 |
12 |     Button but1;
13 |
14 |     @Override
15 |     protected void onCreate(Bundle savedInstanceState) {
16 |         super.onCreate(savedInstanceState);
17 |         setContentView(R.layout.activity_main);
18 |
19 |         process();
20 |     }
21 |     void process() {
22 |         but1=(Button) findViewById(R.id.button);
23 |
24 |         but1.setOnClickListener(new View.OnClickListener() {
25 |             @Override
26 |             public void onClick(View view) {
27 |                 Intent i = new Intent(getApplicationContext(),
   | MainActivity2.class);
28 |                 i.putExtra("Value1", "Intent Example");
29 |                 i.putExtra("Value2", "By Dr. Malay Dave");
30 |                 startActivity(i);
31 |             }
32 |         });
33 |
34 |     }
35 | }
   | _____
1  | MainActivity2.kt
2  | _____
3  | package com.example.intentdemo;
4  |
5  | import androidx.appcompat.app.AppCompatActivity;
6  |
7  | import android.content.Intent;
8  | import android.os.Bundle;
9  | import android.view.View;
10 | import android.widget.Button;
11 | import android.widget.Toast;
12 |
13 | public class MainActivity2 extends AppCompatActivity {
14 |
15 |     Button but2;
16 |
17 |     @Override
18 |     protected void onCreate(Bundle savedInstanceState) {
19 |         super.onCreate(savedInstanceState);
20 |         setContentView(R.layout.activity_main2);
21 |
22 |         Bundle extras = getIntent().getExtras();
23 |         String value1 = extras.getString("Value1");
   |         String value2 = extras.getString("Value2");
24 |         Toast.makeText(getApplicationContext(), "Values are:\n First value: " +
25 | value1 + "\n Second Value: " + value2, Toast.LENGTH_LONG).show();
26 |
27 |         process();
28 |     }
29 |
```

```
30     void process() {
31         but2=(Button) findViewById(R.id.button2);
32         but2.setOnClickListener(new View.OnClickListener() {
33             @Override
           public void onClick(View view) {
34               Intent i = new Intent(getApplicationContext(),
35  MainActivity.class);
36                 startActivity(i);
37             }
38         });
       }
   }
```
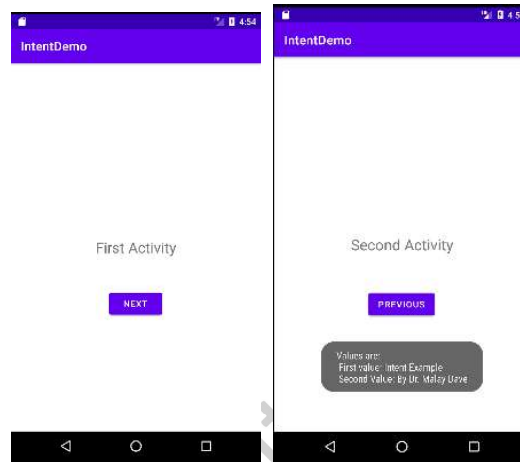

29. Implicit Intent

```
activity_main.xml
-----------------
1   <?xml version="1.0" encoding="utf-8"?>
2   <androidx.constraintlayout.widget.ConstraintLayout
3   xmlns:android="http://schemas.android.com/apk/res/android"
4       xmlns:app="http://schemas.android.com/apk/res-auto"
5       xmlns:tools="http://schemas.android.com/tools"
6       android:layout_width="match_parent"
7       android:layout_height="match_parent"
8       tools:context=".MainActivity">
9
10      <TextView
11          android:id="@+id/textView"
12          android:layout_width="wrap_content"
13          android:layout_height="wrap_content"
14          android:text="Implicit Intent"
15          android:textSize="24sp"
16          app:layout_constraintBottom_toBottomOf="parent"
17          app:layout_constraintEnd_toEndOf="parent"
18          app:layout_constraintStart_toStartOf="parent"
19          app:layout_constraintTop_toTopOf="parent"
20          app:layout_constraintVertical_bias="0.188" />
21
22      <Button
23          android:id="@+id/button"
24          android:layout_width="wrap_content"
25          android:layout_height="wrap_content"
26          android:layout_marginTop="68dp"
27          android:text="Share"
28          app:layout_constraintEnd_toEndOf="parent"
29          app:layout_constraintHorizontal_bias="0.498"
30          app:layout_constraintStart_toStartOf="parent"
```

```
31              app:layout_constraintTop_toBottomOf="@+id/textView" />
32
33   </androidx.constraintlayout.widget.ConstraintLayout>
     ----------------------------------------------------------------
     MainActivity.kt
     ---------------
1    package com.example.implicitintent;
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.widget.Button;
9
10   public class MainActivity extends AppCompatActivity {
11
12       Button but;
13
14       @Override
15       protected void onCreate(Bundle savedInstanceState) {
16           super.onCreate(savedInstanceState);
17           setContentView(R.layout.activity_main);
18
19           but=(Button) findViewById(R.id.button);
20
21           but.setOnClickListener(new View.OnClickListener() {
22               @Override
23               public void onClick(View view) {
24                   Intent shareIntent =   new
25   Intent(android.content.Intent.ACTION_SEND);
26                   shareIntent.setType("text/plain");
27                   shareIntent.putExtra(Intent.EXTRA_SUBJECT,"Insert Subject here");
28                   String app_url = " https://www.google.co.in";
29                   shareIntent.putExtra(android.content.Intent.EXTRA_TEXT,app_url);
30                   startActivity(Intent.createChooser(shareIntent, "Share via"));
31               }
32           });
33
34       }
35   }
```
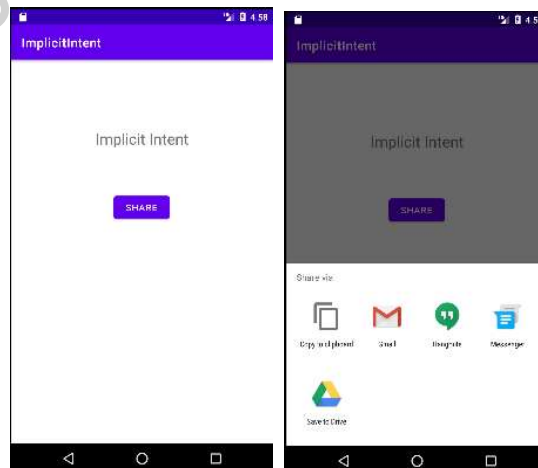
30. AlertDialog

```
activity_main.xml
-----------------
1  <?xml version="1.0" encoding="utf-8"?>
2  <android.support.constraint.ConstraintLayout
3  xmlns:android="http://schemas.android.com/apk/res/android"
4      xmlns:app="http://schemas.android.com/apk/res-auto"
5      xmlns:tools="http://schemas.android.com/tools"
6      android:layout_width="match_parent"
7      android:layout_height="match_parent"
8      tools:context="example.com.kotlinalertdialog.MainActivity">
9
10     <Button
11         android:id="@+id/button"
12         android:layout_width="wrap_content"
13         android:layout_height="wrap_content"
14         android:layout_marginBottom="8dp"
15         android:layout_marginEnd="8dp"
16         android:layout_marginStart="8dp"
17         android:layout_marginTop="8dp"
18         android:text="@string/button"
19         app:layout_constraintBottom_toBottomOf="parent"
20         app:layout_constraintEnd_toEndOf="parent"
21         app:layout_constraintStart_toStartOf="parent"
22         app:layout_constraintTop_toTopOf="parent" />
23
24 </android.support.constraint.ConstraintLayout>
   ----------------------------------------------------------------
   strings.xml
   -----------
1  <resources>
2      <string name="app_name">Kotlin AlertDialog</string>
3      <string name="button">click button</string>
4      <string name="dialogTitle">Delete File</string>
5      <string name="dialogMessage">Deleting file may be harm your system</string>
6
7  </resources>
   ----------------------------------------------------------------
   MainActivity.kt
   ---------------
1  package example.com.kotlinalertdialog
2
3  import android.support.v7.app.AppCompatActivity
4  import android.os.Bundle
5  import android.support.v7.app.AlertDialog
6  import android.widget.Button
7  import android.widget.Toast
8
9  class MainActivity : AppCompatActivity() {
10
11     override fun onCreate(savedInstanceState: Bundle?) {
12         super.onCreate(savedInstanceState)
13         setContentView(R.layout.activity_main)
14
15         val button = findViewById<Button>(R.id.button)
16
17         button.setOnClickListener {
18             val builder = AlertDialog.Builder(this)
19             //set title for alert dialog
20             builder.setTitle(R.string.dialogTitle)
21             //set message for alert dialog
22             builder.setMessage(R.string.dialogMessage)
23             builder.setIcon(android.R.drawable.ic_dialog_alert)
```

```
24
25              //performing positive action
26              builder.setPositiveButton("Yes"){dialogInterface, which ->
27                  Toast.makeText(applicationContext,"clicked
28  yes",Toast.LENGTH_LONG).show()
29              }
30              //performing cancel action
31              builder.setNeutralButton("Cancel"){dialogInterface , which ->
32                  Toast.makeText(applicationContext,"clicked cancel\n operation
33  cancel",Toast.LENGTH_LONG).show()
34              }
35              //performing negative action
36              builder.setNegativeButton("No"){dialogInterface, which ->
37                  Toast.makeText(applicationContext,"clicked
38  No",Toast.LENGTH_LONG).show()
39              }
40              // Create the AlertDialog
41              val alertDialog: AlertDialog = builder.create()
42              // Set other dialog properties
43              alertDialog.setCancelable(false)
44              alertDialog.show()
45          }
46      }
48  }
```
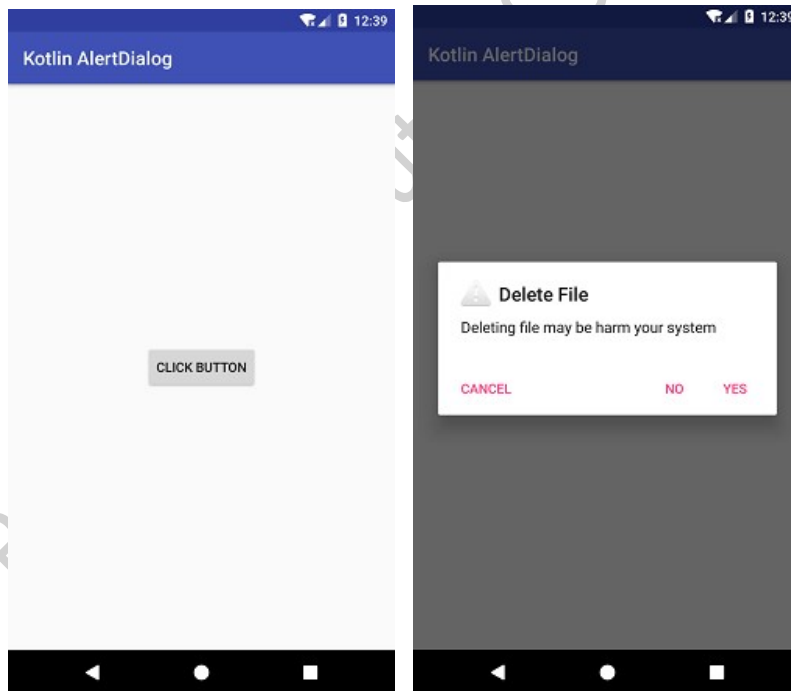
Unit – 4

Database Connectivity Using SQLite and Content Provider

31. Write Data into External Storage

```
activity_main.xml
-----------------
1   <?xml version="1.0" encoding="utf-8"?>
2   <RelativeLayout 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="example.com.kotlinexternalstoragereadwrite.MainActivity">
8
9
10      <TextView
11          android:id="@+id/textView"
12          android:layout_width="wrap_content"
13          android:layout_height="wrap_content"
14          android:layout_alignLeft="@+id/textView2"
15          android:layout_alignParentTop="true"
16          android:layout_alignStart="@+id/textView2"
17          android:layout_marginTop="68dp"
18          android:text="File Name"
19          android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
20          app:layout_constraintBottom_toBottomOf="parent"
21          app:layout_constraintEnd_toEndOf="parent"
22          app:layout_constraintHorizontal_bias="0.027"
23          app:layout_constraintStart_toStartOf="parent"
24          app:layout_constraintTop_toTopOf="parent"
25          app:layout_constraintVertical_bias="0.065" />
26
27      <TextView
28          android:id="@+id/textView2"
29          android:layout_width="wrap_content"
30          android:layout_height="wrap_content"
31          android:layout_alignBottom="@+id/editTextData"
32          android:layout_alignParentLeft="true"
33          android:layout_alignParentStart="true"
34          android:layout_marginBottom="36dp"
35          android:layout_marginLeft="50dp"
36          android:layout_marginStart="50dp"
37          android:text="File Data"
38          android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
39          app:layout_constraintBottom_toBottomOf="parent"
40          app:layout_constraintEnd_toEndOf="parent"
41          app:layout_constraintHorizontal_bias="0.027"
42          app:layout_constraintStart_toStartOf="parent"
43          app:layout_constraintTop_toBottomOf="@+id/textView"
44          app:layout_constraintVertical_bias="0.167" />
45
46      <EditText
47          android:id="@+id/editTextFile"
48          android:layout_width="wrap_content"
49          android:layout_height="wrap_content"
50          android:layout_alignLeft="@+id/editTextData"
51          android:layout_alignStart="@+id/editTextData"
52          android:layout_alignTop="@+id/textView"
53          android:ems="10"
54          android:inputType="none" />
55
56      <EditText
57          android:id="@+id/editTextData"
58          android:layout_width="wrap_content"
59          android:layout_height="wrap_content"
60          android:layout_alignParentEnd="true"
```

```
61          android:layout_alignParentRight="true"
62          android:layout_below="@+id/editTextFile"
63          android:layout_marginEnd="37dp"
64          android:layout_marginRight="37dp"
65          android:layout_marginTop="30dp"
66          android:ems="10"
67          android:inputType="none"
68          android:lines="5" />
69
70      <Button
71          android:id="@+id/button_save"
72          android:layout_width="wrap_content"
73          android:layout_height="wrap_content"
74          android:layout_alignParentBottom="true"
75          android:layout_marginBottom="68dp"
76          android:layout_toLeftOf="@+id/editTextData"
77          android:layout_toStartOf="@+id/editTextData"
78          android:text="Save" />
79
80      <Button
81          android:id="@+id/button_view"
82          android:layout_width="wrap_content"
83          android:layout_height="wrap_content"
84          android:layout_alignBottom="@+id/button_save"
85          android:layout_alignEnd="@+id/editTextData"
86          android:layout_alignRight="@+id/editTextData"
87          android:layout_marginEnd="43dp"
88          android:layout_marginRight="43dp"
89          android:text="View" />
90
91  </RelativeLayout>
    ---------------------------------------------------------------
    MainActivity.kt
    ---------------
1   package example.com.kotlinexternalstoragereadwrite
2
3   import android.support.v7.app.AppCompatActivity
4   import android.os.Bundle
5   import android.view.View
6   import android.widget.Button
7   import android.widget.EditText
8   import android.widget.Toast
9   import android.os.Environment
10  import java.io.*
11
12  class MainActivity : AppCompatActivity() {
13      private val filepath = "MyFileStorage"
14      internal var myExternalFile: File?=null
15      private val isExternalStorageReadOnly: Boolean get() {
16          val extStorageState = Environment.getExternalStorageState()
17          return if (Environment.MEDIA_MOUNTED_READ_ONLY.equals(extStorageState)) {
18                  true
19          } else {
20                  false
21          }
22      }
23      private val isExternalStorageAvailable: Boolean get() {
24          val extStorageState = Environment.getExternalStorageState()
25          return if (Environment.MEDIA_MOUNTED.equals(extStorageState)) {
26              true
27          } else{
28              false
29          }
```

```kotlin
30          }
31
32      override fun onCreate(savedInstanceState: Bundle?) {
33          super.onCreate(savedInstanceState)
34          setContentView(R.layout.activity_main)
35          val fileName = findViewById(R.id.editTextFile) as EditText
36          val fileData = findViewById(R.id.editTextData) as EditText
37          val saveButton = findViewById<Button>(R.id.button_save) as Button
38          val viewButton = findViewById(R.id.button_view) as Button
39
40          saveButton.setOnClickListener(View.OnClickListener {
41              myExternalFile = File(getExternalFilesDir(filepath),
   fileName.text.toString())
42                  try {
43                      val fileOutPutStream = FileOutputStream(myExternalFile)
44                      fileOutPutStream.write(fileData.text.toString().toByteArray())
45                      fileOutPutStream.close()
46                  } catch (e: IOException) {
47                      e.printStackTrace()
48                  }
49                  Toast.makeText(applicationContext,"data save",Toast.LENGTH_SHORT).show()
50          })
51          viewButton.setOnClickListener(View.OnClickListener {
52              myExternalFile = File(getExternalFilesDir(filepath),
   fileName.text.toString())
53
54              val filename = fileName.text.toString()
55              myExternalFile = File(getExternalFilesDir(filepath),filename)
56              if(filename.toString()!=null && filename.toString().trim()!=""){
57                  var fileInputStream =FileInputStream(myExternalFile)
58                  var inputStreamReader: InputStreamReader =
   InputStreamReader(fileInputStream)
59                  val bufferedReader: BufferedReader = BufferedReader(inputStreamReader)
60                  val stringBuilder: StringBuilder = StringBuilder()
61                  var text: String? = null
62                  while ({ text = bufferedReader.readLine(); text }() != null) {
63                      stringBuilder.append(text)
64                  }
65                  fileInputStream.close()
66                  //Displaying data on EditText
67
   Toast.makeText(applicationContext,stringBuilder.toString(),Toast.LENGTH_SHORT).show()
68              }
69          })
70
71          if (!isExternalStorageAvailable || isExternalStorageReadOnly) {
72              saveButton.isEnabled = false
73          }
74      }
75  }
```

  AndroidManifest.xml

```xml
1   --------------------
2   <?xml version="1.0" encoding="utf-8"?>
3   <manifest xmlns:android="http://schemas.android.com/apk/res/android"
4       package="example.javatpoint.com.kotlinexternalstoragereadwrite">
5       <uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE"/>
6       <uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>
7       <application
8           android:allowBackup="true"
9           android:icon="@mipmap/ic_launcher"
10          android:label="@string/app_name"
11          android:roundIcon="@mipmap/ic_launcher_round"
12          android:supportsRtl="true"
```

```
13            android:theme="@style/AppTheme">
14            <activity android:name=".MainActivity">
15                <intent-filter>
16                    <action android:name="android.intent.action.MAIN" />
17
18                    <category android:name="android.intent.category.LAUNCHER" />
19                </intent-filter>
20            </activity>
21        </application>
22

    </manifest>
```
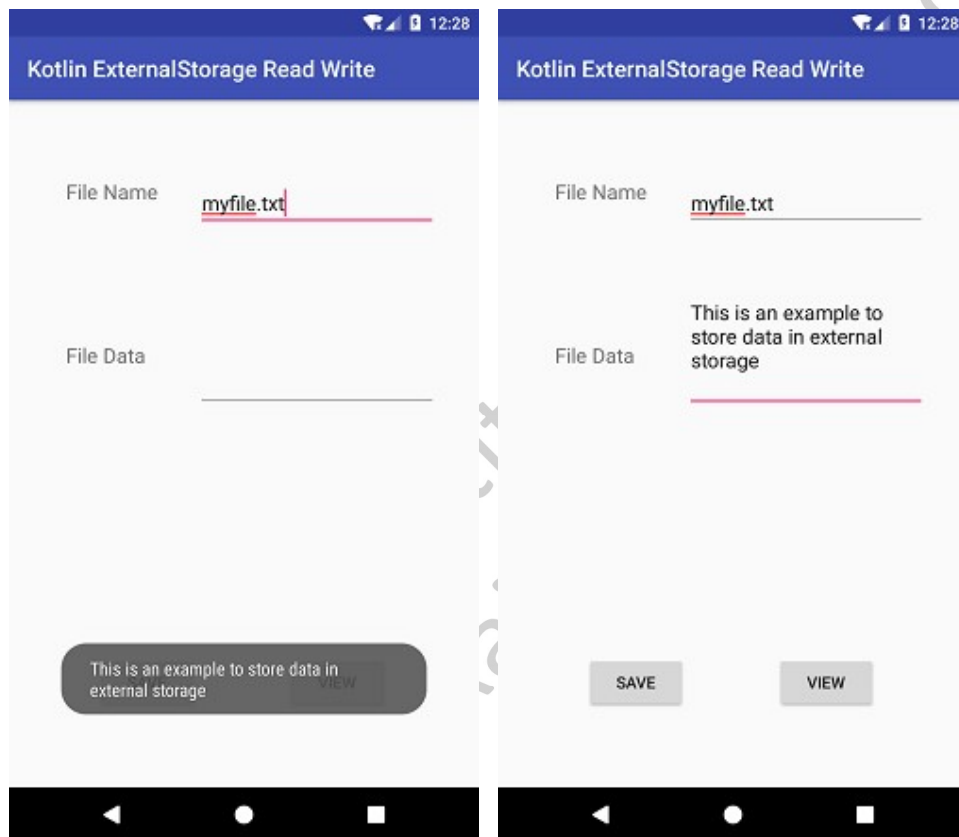

32. SharedPreferences

```
     activity_main.xml
     -----------------
1    <?xml version="1.0" encoding="utf-8"?>
2    <android.support.constraint.ConstraintLayout
3    xmlns:android="http://schemas.android.com/apk/res/android"
4        xmlns:app="http://schemas.android.com/apk/res-auto"
5        xmlns:tools="http://schemas.android.com/tools"
6        android:layout_width="match_parent"
7        android:layout_height="match_parent"
8        tools:context="example.com.kotlinsharedpreference.MainActivity">
9
10       <TableLayout
11           android:layout_width="368dp"
12           android:layout_height="495dp"
13           android:layout_marginBottom="8dp"
14           android:layout_marginEnd="8dp"
15           android:layout_marginStart="8dp"
16           android:layout_marginTop="8dp"
```

```
17              app:layout_constraintBottom_toBottomOf="parent"
18              app:layout_constraintEnd_toEndOf="parent"
19              app:layout_constraintStart_toStartOf="parent"
20              app:layout_constraintTop_toTopOf="parent">
21              <TableRow>
22                  <TextView
23                      android:layout_width="wrap_content"
24                      android:layout_height="wrap_content"
25                      android:layout_column="0"
26                      android:layout_marginLeft="10sp"
27                      android:layout_marginStart="10sp"
28                      android:text="Enter Id"
29                      android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
    />
30                  <EditText
31                      android:id="@+id/editId"
32                      android:layout_width="201dp"
33                      android:layout_height="wrap_content"
34                      android:layout_column="1"
35                      android:layout_marginLeft="50sp"
36                      android:layout_marginStart="50sp"
37                      android:hint="id"
38                      android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
    />
39              </TableRow>
40              <TableRow>
41
42                  <TextView
43                      android:layout_width="wrap_content"
44                      android:layout_height="wrap_content"
45                      android:layout_column="0"
46                      android:layout_marginLeft="10sp"
47                      android:layout_marginStart="10sp"
48                      android:text="Enter Name"
49                      android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
    />
50
51                  <EditText
52                      android:id="@+id/editName"
53                      android:layout_width="wrap_content"
54                      android:layout_height="wrap_content"
55                      android:layout_column="1"
56                      android:layout_marginLeft="50sp"
57                      android:layout_marginStart="50sp"
58                      android:hint="name"
59                      android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
    />
60              </TableRow>
61              <TableRow android:layout_marginTop="60dp">
62
63                  <TextView
64                      android:layout_width="wrap_content"
65                      android:layout_height="wrap_content"
66                      android:layout_column="0"
67                      android:layout_marginLeft="10sp"
68                      android:layout_marginStart="10sp"
69                      android:text="Your Id"
70                      android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
    />
71                  <TextView
72                      android:id="@+id/textViewShowId"
73                      android:layout_width="wrap_content"
74                      android:layout_height="wrap_content"
75                      android:layout_column="1"
```

```
76                  android:layout_marginLeft="50sp"
77                  android:layout_marginStart="50sp"
78                  android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
79      />
            </TableRow>
80          <TableRow android:layout_marginTop="20dp">
81              <TextView
82                  android:layout_width="wrap_content"
83                  android:layout_height="wrap_content"
84                  android:layout_column="0"
85                  android:layout_marginLeft="10sp"
86                  android:layout_marginStart="10sp"
87                  android:text="Your Name"
88                  android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
        />
89              <TextView
90                  android:id="@+id/textViewShowName"
91                  android:layout_width="wrap_content"
92                  android:layout_height="wrap_content"
93                  android:layout_column="1"
94                  android:layout_marginLeft="50sp"
95                  android:layout_marginStart="50sp"
96                  android:textAppearance="@style/Base.TextAppearance.AppCompat.Medium"
97      />
            </TableRow>
98          </TableLayout>
99      </TableLayout>
100
101     <LinearLayout
102         android:layout_width="fill_parent"
103         android:layout_height="wrap_content"
104         android:layout_marginBottom="16dp"
105         android:layout_marginEnd="8dp"
106         android:layout_marginStart="8dp"
107         android:orientation="horizontal"
108         android:gravity="center"
109         app:layout_constraintBottom_toBottomOf="parent"
110         app:layout_constraintEnd_toEndOf="parent"
111         app:layout_constraintHorizontal_bias="0.0"
112         app:layout_constraintStart_toStartOf="parent">
113         <Button
114             android:id="@+id/save"
115             android:layout_width="wrap_content"
116             android:layout_height="wrap_content"
117             android:text="Save" />
118         <Button
119             android:id="@+id/view"
120             android:layout_width="wrap_content"
121             android:layout_height="wrap_content"
122             android:text="View" />
123         <Button
124             android:id="@+id/clear"
125             android:layout_width="wrap_content"
126             android:layout_height="wrap_content"
127             android:text="Clear" />
128     </LinearLayout>
129 </android.support.constraint.ConstraintLayout>
    ----------------------------------------------------------------
    MainActivity.kt
    ----------------
1   package example.com.kotlinsharedpreference
2
3   import android.content.Context
4   import android.content.SharedPreferences
```

```
5     import android.support.v7.app.AppCompatActivity
6     import android.os.Bundle
7     import android.view.View
8     import android.widget.Button
9     import android.widget.EditText
10    import android.widget.TextView
11
12
13
14    class MainActivity : AppCompatActivity() {
15
16        private val sharedPrefFile = "kotlinsharedpreference"
17
18        override fun onCreate(savedInstanceState: Bundle?) {
19            super.onCreate(savedInstanceState)
20            setContentView(R.layout.activity_main)
21
22            val inputId = findViewById<EditText>(R.id.editId)
23            val inputName = findViewById<EditText>(R.id.editName)
24            val outputId = findViewById<TextView>(R.id.textViewShowId)
25            val outputName = findViewById<TextView>(R.id.textViewShowName)
26
27            val btnSave = findViewById<Button>(R.id.save)
28            val btnView = findViewById<Button>(R.id.view)
29            val btnClear = findViewById<Button>(R.id.clear)
30            val sharedPreferences: SharedPreferences =
31    this.getSharedPreferences(sharedPrefFile,Context.MODE_PRIVATE)
32            btnSave.setOnClickListener(View.OnClickListener {
33                val id:Int = Integer.parseInt(inputId.text.toString())
34                val name:String = inputName.text.toString()
35                val editor:SharedPreferences.Editor =  sharedPreferences.edit()
36                editor.putInt("id_key",id)
37                editor.putString("name_key",name)
38                editor.apply()
39                editor.commit()
40            })
41            btnView.setOnClickListener {
42                val sharedIdValue = sharedPreferences.getInt("id_key",0)
43                val sharedNameValue =
44    sharedPreferences.getString("name_key","defaultname")
45                if(sharedIdValue.equals(0) && sharedNameValue.equals("defaultname")){
46                    outputName.setText("default name: ${sharedNameValue}").toString()
48                    outputId.setText("default id: ${sharedIdValue.toString()}")
49                }else{
50                    outputName.setText(sharedNameValue).toString()
51                    outputId.setText(sharedIdValue.toString())
52                }
53
54            }
55            btnClear.setOnClickListener(View.OnClickListener {
56                val editor = sharedPreferences.edit()
57                editor.clear()
58                editor.apply()
59                outputName.setText("").toString()
60                outputId.setText("".toString())
61            })
62        }
63    }
```
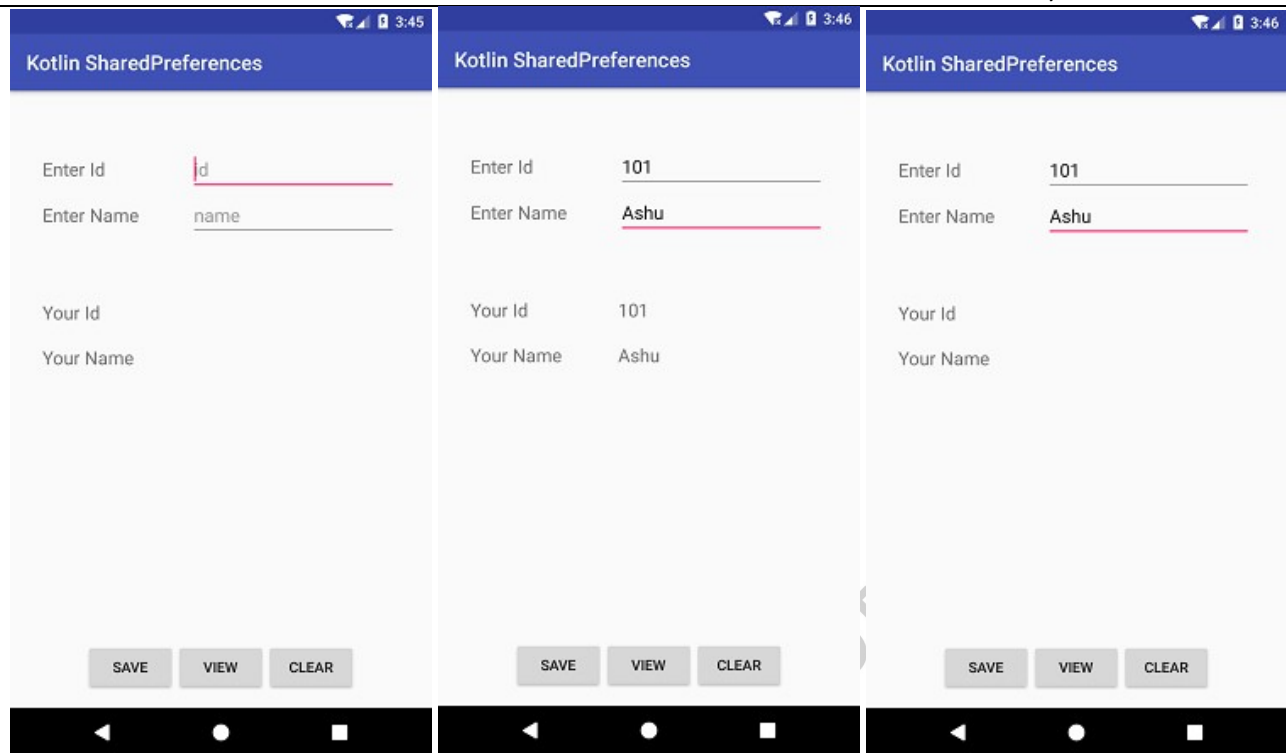
33. SQLite Example

```
MainActivity.kt
----------------
1    package com.example.sqlitedemojava;
2
3    import androidx.appcompat.app.AppCompatActivity;
4
5    import android.os.Bundle;
6    import android.util.Log;
7
8    import java.util.List;
9
10   public class MainActivity extends AppCompatActivity {
11
12       @Override
13       protected void onCreate(Bundle savedInstanceState) {
14           super.onCreate(savedInstanceState);
15           setContentView(R.layout.activity_main);
16
17           DatabaseHandler db = new DatabaseHandler(this);
18
19           // Inserting Contacts
20           Log.d("Insert: ", "Inserting ..");
21           db.addContact(new Contact("Ravi", "9100000000"));
22           db.addContact(new Contact("Srinivas", "9199999999"));
23           db.addContact(new Contact("Tommy", "9522222222"));
24           db.addContact(new Contact("Karthik", "9533333333"));
25
26           // Reading all contacts
27           Log.d("Reading: ", "Reading all contacts..");
28           List<Contact> contacts = db.getAllContacts();
29
30           for (Contact cn : contacts) {
31               String log = "Id: " + cn.getID() + " ,Name: " + cn.getName() + " ,Phone:
     " +
32                       cn.getPhoneNumber();
```

```
33              // Writing Contacts to log
34              Log.d("Name: ", log);
35          }
36
37      }
38  }
```

DatabaseHandler.java

```
1   package com.example.sqlitedemojava;
2
3   import android.content.ContentValues;
4   import android.content.Context;
5   import android.database.Cursor;
6   import android.database.sqlite.SQLiteDatabase;
7   import android.database.sqlite.SQLiteOpenHelper;
8   import java.util.ArrayList;
9   import java.util.List;
10
11  public class DatabaseHandler extends SQLiteOpenHelper {
12      private static final int DATABASE_VERSION = 1;
13      private static final String DATABASE_NAME = "contactsManager";
14      private static final String TABLE_CONTACTS = "contacts";
15      private static final String KEY_ID = "id";
16      private static final String KEY_NAME = "name";
17      private static final String KEY_PH_NO = "phone_number";
18
19      public DatabaseHandler(Context context) {
20          super(context, DATABASE_NAME, null, DATABASE_VERSION);
21          //3rd argument to be passed is CursorFactory instance
22      }
23      // Creating Tables
24      @Override
25      public void onCreate(SQLiteDatabase db) {
26          String CREATE_CONTACTS_TABLE = "CREATE TABLE " + TABLE_CONTACTS + "("
27                  + KEY_ID + " INTEGER PRIMARY KEY," + KEY_NAME + " TEXT,"
28                  + KEY_PH_NO + " TEXT" + ")";
29          db.execSQL(CREATE_CONTACTS_TABLE);
30      }
31      // Upgrading database
32      @Override
33      public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
34          // Drop older table if existed
35          db.execSQL("DROP TABLE IF EXISTS " + TABLE_CONTACTS);
36
37          // Create tables again
38          onCreate(db);
39      }
40      // code to add the new contact
41      void addContact(Contact contact) {
42          SQLiteDatabase db = this.getWritableDatabase();
43
44          ContentValues values = new ContentValues();
45          values.put(KEY_NAME, contact.getName()); // Contact Name
46          values.put(KEY_PH_NO, contact.getPhoneNumber()); // Contact Phone
47          // Inserting Row
48          db.insert(TABLE_CONTACTS, null, values);
49          //2nd argument is String containing nullColumnHack
50          db.close(); // Closing database connection
51      }
52      // code to get the single contact
53      Contact getContact(int id) {
54          SQLiteDatabase db = this.getReadableDatabase();
55
```

```
56      Cursor cursor = db.query(TABLE_CONTACTS, new String[] { KEY_ID,
57                  KEY_NAME, KEY_PH_NO }, KEY_ID + "=?",
58          new String[] { String.valueOf(id) }, null, null, null, null);
59      if (cursor != null)
60          cursor.moveToFirst();
61
62      Contact contact = new Contact(Integer.parseInt(cursor.getString(0)),
63              cursor.getString(1), cursor.getString(2));
64      // return contact
65      return contact;
66  }
67  // code to get all contacts in a list view
68  public List<Contact> getAllContacts() {
69      List<Contact> contactList = new ArrayList<Contact>();
70      // Select All Query
71      String selectQuery = "SELECT  * FROM " + TABLE_CONTACTS;
72
73      SQLiteDatabase db = this.getWritableDatabase();
74      Cursor cursor = db.rawQuery(selectQuery, null);
75
76      // looping through all rows and adding to list
77      if (cursor.moveToFirst()) {
78          do {
79              Contact contact = new Contact();
80              contact.setID(Integer.parseInt(cursor.getString(0)));
81              contact.setName(cursor.getString(1));
82              contact.setPhoneNumber(cursor.getString(2));
83              // Adding contact to list
84              contactList.add(contact);
85          } while (cursor.moveToNext());
86      }
87      // return contact list
88      return contactList;
89  }
90  // code to update the single contact
91  public int updateContact(Contact contact) {
92      SQLiteDatabase db = this.getWritableDatabase();
93
94      ContentValues values = new ContentValues();
95      values.put(KEY_NAME, contact.getName());
96      values.put(KEY_PH_NO, contact.getPhoneNumber());
97
98      // updating row
99      return db.update(TABLE_CONTACTS, values, KEY_ID + " = ?",
100             new String[] { String.valueOf(contact.getID()) });
101 }
102 // Deleting single contact
103 public void deleteContact(Contact contact) {
104     SQLiteDatabase db = this.getWritableDatabase();
105     db.delete(TABLE_CONTACTS, KEY_ID + " = ?",
106             new String[] { String.valueOf(contact.getID()) });
107     db.close();
108 }
109 // Getting contacts Count
110 public int getContactsCount() {
112     String countQuery = "SELECT  * FROM " + TABLE_CONTACTS;
113     SQLiteDatabase db = this.getReadableDatabase();
114     Cursor cursor = db.rawQuery(countQuery, null);
115     cursor.close();
116     // return count
117     return cursor.getCount();
118 }
119 }
```

```
--------------------------------------------------------------------------------
Contact.java
------------
1   package com.example.sqlitedemojava;
2
3   public class Contact {
4       int _id;
5       String _name;
6       String _phone_number;
7       public Contact(){    }
8       public Contact(int id, String name, String _phone_number){
9           this._id = id;
10          this._name = name;
11          this._phone_number = _phone_number;
12      }
13      public Contact(String name, String _phone_number){
14          this._name = name;
15          this._phone_number = _phone_number;
16      }
17      public int getID(){
18          return this._id;
19      }
20      public void setID(int id){
21          this._id = id;
22      }
23      public String getName(){
24          return this._name;
25      }
26      public void setName(String name){
27          this._name = name;
28      }
29      public String getPhoneNumber(){
30          return this._phone_number;
31      }
32      public void setPhoneNumber(String phone_number){
33          this._phone_number = phone_number;
34      }
35  }
```

```
Logcat:    Logcat  ×    +                                                                                         ☆  —
  Pixel 2 API 24 (emulator-5554) Android 7.0, API 24        ▼      sqlitedemo                                   ×  ★  ⑦
  2023-01-30 16:00:22.640  2243-2243  Insert:       com.example.sqlitedemojava    D  Inserting ..
  2023-01-30 16:00:22.753  2243-2243  Reading:      com.example.sqlitedemojava    D  Reading all contacts..
  2023-01-30 16:00:22.757  2243-2243  Name:         com.example.sqlitedemojava    D  Id: 1 ,Name: Ravi ,Phone: 9100000000
  2023-01-30 16:00:22.757  2243-2243  Name:         com.example.sqlitedemojava    D  Id: 2 ,Name: Srinivas ,Phone: 9199999999
  2023-01-30 16:00:22.758  2243-2243  Name:         com.example.sqlitedemojava    D  Id: 3 ,Name: Tommy ,Phone: 9522222222
  2023-01-30 16:00:22.758  2243-2243  Name:         com.example.sqlitedemojava    D  Id: 4 ,Name: Karthik ,Phone: 9533333333
  ▶ Version Control   ▶. Run  ≡ TODO  ⊘ Problems  ⊠ Terminal  ≡ Logcat  ⬥ App Inspection  ⟋ Build  ⟑ Profiler        ○ Event Log   Layout Inspector
  ⟲ Launch succeeded (3 minutes ago)                                                                     15:48  LF  UTF-8  4 spaces
```

Unit – 5

Location Based Services (LBS), Common Android API, Notifications, Services, Deployment of applications

34. Android device vibrate programmatically

```
activity_main.xml
-----------------
1   <?xml version="1.0" encoding="utf-8"?>
2   <androidx.constraintlayout.widget.ConstraintLayout
3   xmlns:android="http://schemas.android.com/apk/res/android"
4       xmlns:app="http://schemas.android.com/apk/res-auto"
5       xmlns:tools="http://schemas.android.com/tools"
6       android:layout_width="match_parent"
7       android:layout_height="match_parent"
8       tools:context=".MainActivity">
9
10      <RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
11          xmlns:tools="http://schemas.android.com/tools"
12          android:layout_width="match_parent"
13          android:layout_height="match_parent"
14          tools:context=".MainActivity">
15          <TextView
16              android:layout_width="wrap_content"
17              android:layout_height="wrap_content"
18              android:layout_centerHorizontal="true"
19              android:layout_marginTop="70dp"
20              android:background="#008080"
21              android:padding="5dp"
22              android:text="Vibrate Device"
23              android:textColor="#fff"
24              android:textSize="24sp"
25              android:textStyle="bold" />
26          <TextView
27              android:id="@+id/textView"
28              android:layout_width="wrap_content"
29              android:layout_height="wrap_content"
30              android:layout_centerInParent="true"
31              android:textColor="@android:color/holo_blue_dark"
32              android:textSize="24sp"
33              android:textStyle="bold" />
34      </RelativeLayout>
35
36  </androidx.constraintlayout.widget.ConstraintLayout>
    ---------------------------------------------------------------
    MainActivity.kt
    ---------------
1   package com.example.vibratedevicekotlin
2
3   import android.content.Context
4   import android.os.Build
5   import androidx.appcompat.app.AppCompatActivity
6   import android.os.Bundle
7   import android.os.VibrationEffect
8   import android.os.Vibrator
9
10  @Suppress("DEPRECATION")
11  class MainActivity : AppCompatActivity() {
12      override fun onCreate(savedInstanceState: Bundle?) {
13          super.onCreate(savedInstanceState)
14          setContentView(R.layout.activity_main)
15
16          title = "KotlinApp"
17          val v = (getSystemService(Context.VIBRATOR_SERVICE) as Vibrator)
18          // Vibrate for 500 milliseconds
19          if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
20
21  v.vibrate(VibrationEffect.createOneShot(500,VibrationEffect.DEFAULT_AMPLITUDE))
```

```
22              }
23          else {
24              v.vibrate(500)
25          }
26      }
27  }
    ──────────────────────────────────────────────────────────────────────
    AndroidManifest.xml
    ───────────────────
1   <?xml version="1.0" encoding="utf-8"?>
2   <manifest xmlns:android="http://schemas.android.com/apk/res/android"
3       xmlns:tools="http://schemas.android.com/tools">
4
5       <uses-permission android:name="android.permission.VIBRATE" />
6       <application
7           android:allowBackup="true"
8           android:dataExtractionRules="@xml/data_extraction_rules"
9           android:fullBackupContent="@xml/backup_rules"
10          android:icon="@mipmap/ic_launcher"
11          android:label="@string/app_name"
12          android:roundIcon="@mipmap/ic_launcher_round"
13          android:supportsRtl="true"
14          android:theme="@style/Theme.VibrateDeviceKotlin"
15          tools:targetApi="31">
16          <activity
17              android:name=".MainActivity"
18              android:exported="true">
19              <intent-filter>
20                  <action android:name="android.intent.action.MAIN" />
21                  <category android:name="android.intent.category.LAUNCHER" />
22              </intent-filter>
23              <meta-data
24                  android:name="android.app.lib_name"
25                  android:value="" />
26          </activity>
27      </application>
28  </manifest>
```

35. Android telephony api

```
activity_main.xml
-----------------
```

```xml
1  <RelativeLayout xmlns:androclass="http://schemas.android.com/apk/res/android"
2      xmlns:tools="http://schemas.android.com/tools"
3      android:layout_width="match_parent"
4      android:layout_height="match_parent"
5      android:paddingBottom="@dimen/activity_vertical_margin"
6      android:paddingLeft="@dimen/activity_horizontal_margin"
7      android:paddingRight="@dimen/activity_horizontal_margin"
8      android:paddingTop="@dimen/activity_vertical_margin"
9      tools:context=".MainActivity" >
10
11     <TextView
12         android:id="@+id/textView1"
13         android:layout_width="wrap_content"
14         android:layout_height="wrap_content"
15         android:layout_alignParentLeft="true"
16         android:layout_alignParentTop="true"
17         android:layout_marginLeft="38dp"
18         android:layout_marginTop="30dp"
19         android:text="Phone Details:" />
20
21 </RelativeLayout>
```

```
------------------------------------------------------------------
MainActivity.kt
----------------
```

```kotlin
1  package com.example.telephonyapi
2
3  import android.os.Bundle;
4  import android.app.Activity;
5  import android.content.Context;
6  import android.telephony.TelephonyManager;
7  import android.view.Menu;
8  import android.widget.TextView;
9
10 public class MainActivity extends Activity {
11     TextView textView1;
12     @Override
13     protected void onCreate(Bundle savedInstanceState) {
14         super.onCreate(savedInstanceState);
15         setContentView(R.layout.activity_main);
16
17         textView1=(TextView)findViewById(R.id.textView1);
18
19         //Get the instance of TelephonyManager
20         TelephonyManager
   tm=(TelephonyManager)getSystemService(Context.TELEPHONY_SERVICE);
21
22         //Calling the methods of TelephonyManager the returns the information
23         String IMEINumber=tm.getDeviceId();
24         String subscriberID=tm.getDeviceId();
25         String SIMSerialNumber=tm.getSimSerialNumber();
26         String networkCountryISO=tm.getNetworkCountryIso();
27         String SIMCountryISO=tm.getSimCountryIso();
28         String softwareVersion=tm.getDeviceSoftwareVersion();
29         String voiceMailNumber=tm.getVoiceMailNumber();
30
31         //Get the phone type
32         String strphoneType="";
33
34         int phoneType=tm.getPhoneType();
35
```

```
36          switch (phoneType)
37          {
38                  case (TelephonyManager.PHONE_TYPE_CDMA):
39                          strphoneType="CDMA";
40                              break;
41                  case (TelephonyManager.PHONE_TYPE_GSM):
42                          strphoneType="GSM";
43                              break;
44                  case (TelephonyManager.PHONE_TYPE_NONE):
45                           strphoneType="NONE";
46                               break;
47           }
48
49          //getting information if phone is in roaming
50          boolean isRoaming=tm.isNetworkRoaming();
51
52          String info="Phone Details:\n";
53          info+="\n IMEI Number:"+IMEINumber;
54          info+="\n SubscriberID:"+subscriberID;
55          info+="\n Sim Serial Number:"+SIMSerialNumber;
56          info+="\n Network Country ISO:"+networkCountryISO;
57          info+="\n SIM Country ISO:"+SIMCountryISO;
58          info+="\n Software Version:"+softwareVersion;
59          info+="\n Voice Mail Number:"+voiceMailNumber;
60          info+="\n Phone Network Type:"+strphoneType;
61          info+="\n In Roaming? :"+isRoaming;
62
63          textView1.setText(info);//displaying the information in the textView
64      }
65  }
    --------------------------------------------------------------------------------
    AndroidManifest.xml
    --------------------
1   <?xml version="1.0" encoding="utf-8"?>
2   <manifest xmlns:androclass="http://schemas.android.com/apk/res/android"
3       package="com.javatpoint.telephonymanager"
4       android:versionCode="1"
5       android:versionName="1.0" >
6
7       <uses-sdk
8           android:minSdkVersion="8"
9           android:targetSdkVersion="17" />
10
11      <uses-permission android:name="android.permission.READ_PHONE_STATE"/>
12
13      <application
14          android:allowBackup="true"
15          android:icon="@drawable/ic_launcher"
16          android:label="@string/app_name"
17          android:theme="@style/AppTheme" >
18          <activity
19              android:name="com.javatpoint.telephonymanager.MainActivity"
20              android:label="@string/app_name" >
21              <intent-filter>
22                  <action android:name="android.intent.action.MAIN" />
23
24                  <category android:name="android.intent.category.LAUNCHER" />
25              </intent-filter>
26          </activity>
27      </application>
28  </manifest>
```

Phone Details:

IMEI Number:000000000000000
SubscriberID:000000000000000
Sim Serial
Number:89014103211118510720
Network Country ISO:us
SIM Country ISO:us
Software Version:null
Voice Mail Number:+15552175049
Phone Network Type:GSM
In Roaming? :false