

----- Practical 1 -----

-->Write an Android program to demonstrate lifecycle of an Activity.

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">

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

mainactivity.kt

```
package com.example.pr1
```

```
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.util.Log

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        Log.d("lifecycle","onCreate() invoked")
    }

    override fun onStart() {
        super.onStart()
        Log.d("lifecycle","onStart() invoked")
    }

    override fun onRestart() {
        super.onRestart()
        Log.d("lifecycle","onRestart() invoked")
    }

    override fun onResume() {
```

```

        super.onResume()
        Log.d("lifecycle","onResume() invoked")
    }

    override fun onPause() {
        super.onPause()
        Log.d("lifecycle","onPause() invoked")
    }

    override fun onStop() {
        super.onStop()
        Log.d("lifecycle","onStop() invoked")
    }

    override fun onDestroy() {
        super.onDestroy()
        Log.d("lifecycle","onDestroy() invoked")
    }
}

```

----- Practical 2 -----

-->Write an Android program to demonstrate different Layouts.

activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center"
    xmlns:android="http://schemas.android.com/apk/res/android">
    <Button
        android:id="@+id/btnlh"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Linear layout horizontal"/>
    <Button
        android:id="@+id/btnlv"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Linear layout vertical"/>
    <Button

```

```
        android:id="@+id/btnr"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Relative layout"/>
</LinearLayout>
```

activity_main2.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout android:layout_height="match_parent"
    android:layout_width="match_parent"
    android:orientation="vertical"
    android:gravity="center"
    xmlns:android="http://schemas.android.com/apk/res/android" >
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button1" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button2" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button3" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button4" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button5" />
</LinearLayout>
```

activity_main3.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
```

```
xmlns:android="http://schemas.android.com/apk/res/android">
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button1"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button2"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button3"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button4"/>
</LinearLayout>
```

activity_main4.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout android:layout_width="match_parent"
    android:layout_height="match_parent"
    xmlns:android="http://schemas.android.com/apk/res/android">
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button1"
        android:id="@+id/btn1"
        android:layout_alignParentRight="true"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button2"
        android:id="@+id/btn2"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button3"
        android:id="@+id/btn3"/>
```

```
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button4"
    android:id="@+id/btn4"
    android:layout_alignParentBottom="true"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button5"
    android:id="@+id/btn5"
    android:layout_centerHorizontal="true"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button6"
    android:id="@+id/btn6"
    android:layout_centerVertical="true"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button7"
    android:id="@+id/btn7"
    android:layout_centerInParent="true"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button8"
    android:id="@+id/btn8"
    android:layout_centerInParent="true"
    android:layout_toRightOf="@id/btn7"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button9"
    android:id="@+id/btn9"
    android:layout_centerInParent="true"
    android:layout_above="@id/btn7"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button10"
    android:id="@+id/btn10"
```

```

        android:layout_centerInParent="true"
        android:layout_below="@id/btn7"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button11"
    android:id="@+id/btn11"
    android:layout_toRightOf="@id/btn5"
    android:layout_below="@id/btn5"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button12"
    android:id="@+id/btn12"
    android:layout_toLeftOf="@id/btn10"
    android:layout_below="@id/btn10"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button13"
    android:id="@+id/btn13"
    android:layout_above="@id/btn9"
    android:layout_alignParentRight="true"/>
</RelativeLayout>

```

mainactivity.kt

```
package com.example.pr2
```

```

import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button
import android.content.Intent
class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        val btnlh = findViewById<Button>(R.id.btnlh)
        val btnlv = findViewById<Button>(R.id.btnlv)
        val btnr = findViewById<Button>(R.id.btnr)

        btnlv.setOnClickListener{

```

```

        val intent = Intent(this,MainActivity2::class.java)
        startActivity(intent)
    }
    btnlh.setOnClickListener{
        val intent = Intent(this,MainActivity3::class.java)
        startActivity(intent)
    }
    btnr.setOnClickListener{
        val intent = Intent(this,MainActivity4::class.java)
        startActivity(intent)
    }
}
}
}

```

----- Practical 3A -----

-->Write an Android program to demonstrate the working of different views (TextView, EditText, Button, ImageButton, ToggleButton, RadioGroup, RadioButton, CheckBox).

activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<ScrollView android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:android="http://schemas.android.com/apk/res/android" >
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">
        <EditText
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/edtName"
            android:hint="Enter Name"
            android:textSize="20dp"/>
        <RadioGroup
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/rg">
            <RadioButton
                android:layout_width="wrap_content"

```

```
        android:layout_height="wrap_content"
        android:id="@+id/rbFemale"
        android:text="Female"
        android:textSize="20dp"/>
    <RadioButton
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/rbMale"
        android:text="Male"
        android:textSize="20dp"/>
    <RadioButton
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/rbOther"
        android:text="Other"
        android:textSize="20dp"/>
</RadioGroup>
<CheckBox
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/chbDance"
    android:text="Dancing"
    android:textSize="20dp"/>
<CheckBox
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/chbSing"
    android:text="Singing"
    android:textSize="20dp"/>
<CheckBox
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/chbRead"
    android:text="Reading"
    android:textSize="20dp"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/btnOk"
    android:text="OK"
    android:textSize="20dp"/>
<TextView
    android:layout_width="wrap_content"
```



```

        android:layout_height="wrap_content"
        android:id="@+id/tvName"
        android:textSize="20dp"/>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tvGender"
    android:textSize="20dp"/>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tvHobbies"
    android:textSize="20dp"/>
<ImageButton
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/imgBtn"
    android:src="@mipmap/ic_launcher_round"/>
<ToggleButton
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tg"
    android:textSize="20dp"/>
</LinearLayout>
</ScrollView>

```

mainactivity.kt

```

package com.example.pr3a
import android.annotation.SuppressLint
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.util.Log
import android.widget.*
class MainActivity : AppCompatActivity() {
    @SuppressLint("MissingInflatedId")
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        val edtName = findViewById<EditText>(R.id.edtName)
        val rg = findViewById<RadioGroup>(R.id.rg)
        val rbMale = findViewById<RadioButton>(R.id.rbMale)
    }
}

```

```

val rbFemale = findViewById<RadioButton>(R.id.rbFemale)
val rbOther = findViewById<RadioButton>(R.id.rbOther)
val chbDance = findViewById<CheckBox>(R.id.chbDance)
val chbSing = findViewById<CheckBox>(R.id.chbSing)
val chbRead = findViewById<CheckBox>(R.id.chbRead)
val btnOk = findViewById<Button>(R.id.btnOk)
val tvName = findViewById<TextView>(R.id.tvName)
val tvGender = findViewById<TextView>(R.id.tvGender)
val tvHobbies = findViewById<TextView>(R.id.tvHobbies)
val imgBtn = findViewById<ImageButton>(R.id.imgBtn)
val tg = findViewById<ToggleButton>(R.id.tg)
var s = ""
btnOk.setOnClickListener {
    tvName.text = edtName.text
    if(rbMale.isChecked)
        tvGender.text = rbMale.text
    else if (rbFemale.isChecked)
        tvGender.text = rbFemale.text
    else
        tvGender.text = rbOther.text
    if(chbDance.isChecked)
        s = chbDance.text as String
    if(chbSing.isChecked)
        s = s + " " + chbSing.text as String
    if(chbRead.isChecked)
        s = s + " " + chbRead.text as String
    tvHobbies.text = s
}
imgBtn.setOnClickListener {
    edtName.setText("")
    rbMale.isChecked = false
    rbFemale.isChecked = false
    rbOther.isChecked = false
    chbDance.isChecked = false
    chbSing.isChecked = false
    chbRead.isChecked = false
    tvName.setText("")
    tvGender.setText("")
    tvHobbies.setText("")
}
tg.setOnCheckedChangeListener { _, isChecked ->
    if(isChecked)
    {

```

```

        Toast.makeText(this, "Toggle Button is ON", Toast.LENGTH_LONG).show()
    }
    else
    {
        Toast.makeText(this, "Toggle Button is OFF", Toast.LENGTH_LONG).show()
    }
}
}
}
}

```

----- Practical 3b -----

--> Write an Android program to demonstrate the working of different views (Spinner, ListView, Menu).

activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:tools="http://schemas.android.com/tools"
    android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:android="http://schemas.android.com/apk/res/android">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/tvSpinner"
        android:text="Spinner"
        android:textSize="35dp"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="30dp" />
    <Spinner
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/spinner1"
        android:layout_marginRight="20dp"
        android:layout_below="@id/tvSpinner"/>
    <Spinner
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/spinner2"
        android:layout_toRightOf="@+id/spinner1"
        android:layout_below="@id/tvSpinner"/>
    <Button

```

```

        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/btn_click"
        android:text="Click Here"
        android:layout_below="@id/spinner1"
        android:textSize="20dp"/>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tvSpinnerOutput"
    android:layout_below="@id/btn_click"
    android:textSize="20dp"/>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tvListView"
    android:text="ListView"
    android:textSize="35dp"
    android:layout_centerHorizontal="true"
    android:layout_below="@id/tvSpinnerOutput"
    android:layout_marginTop="30dp" />
<ListView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/listView"
    android:layout_below="@+id/tvListView"/>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tvListViewOutput"
    android:layout_below="@id/listView"
    android:textSize="20dp"/>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tvMenu"
    android:text="Menu"
    android:textSize="35dp"
    android:layout_centerHorizontal="true"
    android:layout_below="@id/tvListViewOutput"
    android:layout_marginTop="30dp" />
<TextView
    android:layout_width="wrap_content"

```

```
        android:layout_height="wrap_content"
        android:id="@+id/tvMenuOutput"
        android:layout_below="@id/tvMenu"
        android:textSize="20dp"/>
</RelativeLayout>
```

mymenu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">
    <item
        android:id="@+id/bm"
        android:title="Bookmarks"/>
    <item
        android:id="@+id/sr"
        android:title="Search"/>
    <item
        android:id="@+id/sa"
        android:title="Save"/>
    <item
        android:id="@+id/sh"
        android:title="Share"/>
    <item
        android:id="@+id/dlt"
        android:title="Delete"/>
</menu>
```

strings.xml

```
<resources>
    <string name="app_name">My Application</string>
    <string-array name="country_name">
        <item>India</item>
        <item>South Africa</item>
        <item>Brazil</item>
        <item>New Zealand</item>
        <item>Australia</item>
    </string-array>
</resources>
```

mainactivity.kt

package com.example.pr3b

```

import android.annotation.SuppressLint
import android.os.Bundle
import android.view.Menu
import android.view.MenuInflater
import android.view.MenuItem
import android.widget.*
import androidx.appcompat.app.AppCompatActivity
import androidx.core.view.get

class MainActivity : AppCompatActivity() {
    @SuppressLint("MissingInflatedId")
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        val sp1 = findViewById<Spinner>(R.id.spinner1)
        val sp2 = findViewById<Spinner>(R.id.spinner2)
        val btnClick = findViewById<Button>(R.id.btn_click)
        val tvSpinnerOutput = findViewById<TextView>(R.id.tvSpinnerOutput)
        val lv = findViewById<ListView>(R.id.listView)
        val tvListViewOutput = findViewById<TextView>(R.id.tvListViewOutput)
        val lst = ArrayList<String>()
        lst.add("ABC")
        lst.add("PQR")
        lst.add("XYZ")
        val os = arrayOf<String>("Windows","IOS","Linux","Android")
        val adp1 = ArrayAdapter(this, android.R.layout.simple_spinner_item,lst)
        adp1.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item)
        sp1.adapter = adp1
        val adp2 = ArrayAdapter.createFromResource(this,
            R.array.country_name,android.R.layout.simple_spinner_item)
        adp2.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item)
        sp2.adapter = adp2
        val adp3 = ArrayAdapter(this, android.R.layout.simple_expandable_list_item_1,os)
        lv.adapter = adp3
        btnClick.setOnClickListener {
            val str1 = sp1.selectedItem.toString()
            val str2 = sp2.selectedItem.toString()
            tvSpinnerOutput.text = "Data from Spinner1 = $str1 \nData from Spinner2 = $str2"
        }
        lv.setOnItemClickListener { adapterView, view, i, l ->
            val str3 = adapterView.getItemAtPosition(i) as String
            tvListViewOutput.text = "Data from ListView = $str3"
        }
    }
}

```

```

@SuppressLint("ResourceType")
override fun onCreateOptionsMenu(menu: Menu?): Boolean {
    menuInflater.inflate(R.xml.mymenu, menu)
    return super.onCreateOptionsMenu(menu)
}
override fun onOptionsItemSelected(item: MenuItem): Boolean {
    val tvMenuOutput = findViewById<TextView>(R.id.tvMenuOutput)
    when (item.itemId){
        R.id.bm -> tvMenuOutput.text = "Bookmarks Selected"
        R.id.sr -> tvMenuOutput.text = "Search Selected"
        R.id.sa -> tvMenuOutput.text = "Save Selected"
        R.id.sh -> tvMenuOutput.text = "Share Selected"
        R.id.dlt -> tvMenuOutput.text = "Delete Selected"
    }
    return super.onOptionsItemSelected(item)
}
}

```

----- Practical 3C -----

--> Write an Android program to demonstrate the working of different views (DatePicker Dialog, TimePicker Dialog, Alert Dialog).

activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:android="http://schemas.android.com/apk/res/android">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/tv1"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="50dp"
        android:text="DatePicker Dialog"
        android:textSize="20dp" />
    <Button
        android:id="@+id/btnPickDate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"

```

```

        android:layout_below="@id/tv1"
        android:layout_marginTop="10dp"
        android:text="Pick Date" />
<TextView
    android:id="@+id/tvDate"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@id/btnPickDate"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="10dp"
    android:textSize="20dp"/>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tv2"
    android:layout_centerHorizontal="true"
    android:layout_below="@id/tvDate"
    android:layout_marginTop="50dp"
    android:text="TimePicker Dialog"
    android:textSize="20dp" />
<Button
    android:id="@+id/btnPickTime"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:layout_below="@id/tv2"
    android:layout_marginTop="10dp"
    android:text="Pick Time" />
<TextView
    android:id="@+id/tvTime"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@id/btnPickTime"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="10dp"
    android:textSize="20dp"/>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tv3"
    android:layout_centerHorizontal="true"
    android:layout_below="@id/tvTime"
    android:layout_marginTop="50dp"

```



```

        android:text="Alert Dialog"
        android:textSize="20dp" />
<Button
    android:id="@+id/btnClickMe"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:layout_below="@id/tv3"
    android:layout_marginTop="10dp"
    android:text="Show Alert Dialog Window" />
<TextView
    android:id="@+id/tvAlertDialog"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@id/btnClickMe"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="10dp"
    android:textSize="20dp"/>
</RelativeLayout>

```

mainactivity.kt

```

package com.example.pr3c
import android.annotation.SuppressLint
import android.app.AlertDialog
import android.app.DatePickerDialog
import android.app.TimePickerDialog
import android.icu.text.DateFormat
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.text.format.DateFormat.is24HourFormat
import android.widget.*
import java.util.Calendar
class MainActivity : AppCompatActivity(), DatePickerDialog.OnDateSetListener,
    TimePickerDialog.OnTimeSetListener {
    lateinit var btnPickDate: Button
    lateinit var tvDate: TextView
    lateinit var btnPickTime: Button
    lateinit var tvTime: TextView
    lateinit var btnClickMe: Button
    lateinit var tvAlertDialog: TextView
    var day: Int = 0
    var month: Int = 0

```

```

var year: Int = 0
var hour: Int = 0
var minute: Int = 0
var myDay: Int = 0
var myMonth: Int = 0
var myYear: Int = 0
var myHour: Int = 0
var myMinute: Int = 0
@SuppressLint("MissingInflatedId")
override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_main)
    btnPickDate = findViewById(R.id.btnPickDate)
    tvDate = findViewById(R.id.tvDate)
    btnPickTime = findViewById(R.id.btnPickTime)
    tvTime = findViewById(R.id.tvTime)
    btnClickMe = findViewById(R.id.btnClickMe)
    tvAlertDialog = findViewById(R.id.tvAlertDialog)
    btnPickDate.setOnClickListener {
        val calender = Calendar.getInstance()
        day = calender.get(Calendar.DAY_OF_MONTH)
        month = calender.get(Calendar.MONTH)
        year = calender.get(Calendar.YEAR)
        val datePickerDialog = DatePickerDialog(this@MainActivity, this@MainActivity,
            year, month, day)
        datePickerDialog.show()
    }
    btnPickTime.setOnClickListener {
        val calender = Calendar.getInstance()
        hour = calender.get(Calendar.HOUR)
        minute = calender.get(Calendar.MINUTE)
        val timePickerDialog = TimePickerDialog(this@MainActivity, this@MainActivity,
            hour, minute, true)
        timePickerDialog.show()
    }
    btnClickMe.setOnClickListener {
        val builder = AlertDialog.Builder(this)
        builder.setTitle("Dialog Box")
        builder.setMessage("Deleting File may harm your system")
        builder.setIcon(android.R.drawable.ic_dialog_alert)
        builder.setPositiveButton("Yes"){dialogInterface, which ->
            tvAlertDialog.text = "Clicked Yes"
        }
    }
}

```

```

        builder.setNegativeButton("No"){dialogInterface, which ->
            tvAlertDialog.text = "Clicked No"
        }
        builder.setNeutralButton("Cancel"){dialogInterface , which ->
            tvAlertDialog.text = "Clicked Cancel\nOperation Cancelled"
        }
        val alertDialog: AlertDialog = builder.create()
        alertDialog.setCancelable(false)
        alertDialog.show()
    }
}

override fun onDateSet(p0: DatePicker?, p1: Int, p2: Int, p3: Int) {
    myYear = p1
    myMonth = p2+1
    myDay = p3
    tvDate.text = "Year: " + myYear + "\n" + "Month: " + myMonth + "\n" + "Day: "
    + myDay
}

override fun onTimeSet(p0: TimePicker?, p1: Int, p2: Int) {
    myHour = p1
    myMinute = p2
    tvTime.text = "Hour: " + myHour + "\n" + "Minute: " + myMinute
}
}

```

----- Practical 4 -----

-->Write an Android program to demonstrate the concept of Intents.

activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:android="http://schemas.android.com/apk/res/android">
    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/edtValue"
        android:textSize="25dp"
        android:layout_centerHorizontal="true"
        android:hint="Enter Value"/>

```

```

<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/btnSubmit"
    android:text="Submit"
    android:layout_centerInParent="true"
    android:textSize="25dp"/>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/tvOutput"
    android:textSize="25dp"
    android:layout_below="@id/btnSubmit"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="100dp"/>
</RelativeLayout>

```

activity_main2.xml

```

<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:android="http://schemas.android.com/apk/res/android" >
    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/edtValue"
        android:textSize="25dp"
        android:layout_centerHorizontal="true"
        android:hint="Enter Value"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/btnReturn"
        android:text="Return"
        android:layout_centerInParent="true"
        android:textSize="25dp"/>
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/tvOutput"
        android:textSize="25dp"
        android:layout_below="@id/btnReturn"

```

```
        android:layout_centerHorizontal="true"
        android:layout_marginTop="100dp"/>
</RelativeLayout>
```

mainactivity.kt

```
package com.example.pr4
import android.content.Intent
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
class MainActivity2 : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main2)
        val edtValue = findViewById<EditText>(R.id.edtValue)
        val btnReturn = findViewById<Button>(R.id.btnReturn)
        val tvOutput = findViewById<TextView>(R.id.tvOutput)
        tvOutput.text = intent.getStringExtra("name")
        btnReturn.setOnClickListener {
            val intent = Intent(this, MainActivity::class.java)
            intent.putExtra("name", edtValue.text.toString())
            startActivity(intent)
        }
    }
}
```

mainactivity2.kt

```
package com.example.pr4
import android.content.Intent
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        val edtValue = findViewById<EditText>(R.id.edtValue)
```

```

        val btnSubmit = findViewById<Button>(R.id.btnSubmit)
        val tvOutput = findViewById<TextView>(R.id.tvOutput)
        btnSubmit.setOnClickListener {
            val intent = Intent(this, MainActivity2::class.java)
            intent.putExtra("name", edtValue.text.toString())
            startActivity(intent)
        }
        tvOutput.text = intent.getStringExtra("name")
    }
}

```

----- Practical 5 -----

-->Write an Android program to demonstrate the working of Notifications.

activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:android="http://schemas.android.com/apk/res/android">
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/btnClick"
        android:text="Click Me"
        android:layout_centerInParent="true"
        android:textSize="25dp"/>
</RelativeLayout>

```

activity_main2.xml

```

<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout android:layout_height="match_parent"
    android:layout_width="match_parent"
    xmlns:android="http://schemas.android.com/apk/res/android" >
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/tv"
        android:text="Notification Page"
    >

```

```
        android:textSize="25dp"
        android:layout_centerInParent="true"/>
</RelativeLayout>
```

mainactivity.kt

```
package com.example.pr5
import android.annotation.SuppressLint
import android.app.Notification
import android.app.NotificationChannel
import android.app.NotificationManager
import android.app.PendingIntent
import android.content.Context
import android.content.Intent
import android.graphics.Color
import android.os.Build
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button
class MainActivity : AppCompatActivity() {
    lateinit var btnClick: Button
    lateinit var notificationManager: NotificationManager
    lateinit var notificationChannel: NotificationChannel
    lateinit var builder: Notification.Builder
    private val channelId = "12345"
    private val description = "Test Notification"
    @SuppressLint("MissingInflatedId")
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        btnClick = findViewById(R.id.btnClick)
        notificationManager = getSystemService(Context.NOTIFICATION_SERVICE) as
            NotificationManager
        btnClick.setOnClickListener {
            val intent = Intent(this, MainActivity2::class.java)
            val pendingIntent = PendingIntent.getActivity(this, 0, intent,
                PendingIntent.FLAG_UPDATE_CURRENT)
            if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
                notificationChannel = NotificationChannel(channelId, description,
                    NotificationManager.IMPORTANCE_HIGH)
                notificationChannel.lightColor = Color.BLUE
                notificationChannel.enableVibration(true)
                notificationManager.createNotificationChannel(notificationChannel)
            }
        }
    }
}
```

```

        builder = Notification.Builder(this, channelId)
            .setContentTitle("NOTIFICATION USING KOTLIN")
            .setContentText("Test Notification")
            .setSmallIcon(R.drawable.ic_launcher_background)
            .setContentIntent(pendingIntent)
        }
        notificationManager.notify(1234, builder.build())
    }
}
}

```

----- Practical 6 -----

--> Write an Android program to demonstrate the working of Internal Storage

activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <EditText
        android:id="@+id/edtMessage"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentRight="true"
        android:layout_marginTop="100dp"
        android:textSize="20dp"
        android:hint="Enter Message"
        android:minLines="5">
    </EditText>
    <Button
        android:id="@+id/btnWrite"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Write Text into File"
        android:onClick="btnWrite"
        android:textSize="20dp"
        android:layout_centerInParent="true" />
    <Button
        android:id="@+id/btnRead"
        android:layout_width="wrap_content"

```



```

        android:layout_height="wrap_content"
        android:text="Read Text From file"
        android:onClick="btnRead"
        android:textSize="20dp"
        android:layout_centerInParent="true"
        android:layout_below="@id/btnWrite"/>
<TextView
    android:id="@+id/tvOutput"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerInParent="true"
    android:layout_below="@id/btnRead"
    android:layout_marginTop="100dp"
    android:textSize="20dp"
    android:minLines="5"/>
</RelativeLayout>

mainactivity.kt

package com.example.pr6
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
import android.widget.Toast
import java.io.InputStreamReader
import java.io.OutputStreamWriter
class MainActivity : AppCompatActivity() {
    lateinit var edtMessage: EditText
    lateinit var tvOutput: TextView
    lateinit var btnWrite: Button
    lateinit var btnRead: Button
    private val READ_BLOCK_SIZE = 100
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        edtMessage = findViewById(R.id.edtMessage)
        tvOutput= findViewById(R.id.tvOutput)
        btnWrite = findViewById(R.id.btnWrite)
        btnRead = findViewById(R.id.btnRead)
        btnWrite.setOnClickListener {
            try {

```

```

        val fileout = openFileOutput("file.txt", MODE_APPEND)
        val outputWriter = OutputStreamWriter(fileout)
        outputWriter.write(edtMessage!!.text.toString())
        outputWriter.write(System.getProperty("line.separator"));
        outputWriter.close()
        Toast.makeText(this, "File saved successfully!!!",
            Toast.LENGTH_SHORT).show()
    } catch (e: Exception) {
        e.printStackTrace()
    }
}

btnRead.setOnClickListener {
    try {
        val fileIn = openFileInput("file.txt")
        val inputRead = InputStreamReader(fileIn)
        val inputBuffer = CharArray(READ_BLOCK_SIZE)
        var s: String = ""
        var charRead: Int
        while (inputRead.read(inputBuffer).also { charRead = it } > 0) {
            val readstring = String(inputBuffer, 0, charRead)
            s += readstring
        }
        if (s.isNullOrEmpty())
        {
            Toast.makeText(this, "First enter some data in the file!!!",
                Toast.LENGTH_SHORT).show()
        }
        else
        {
            tvOutput.setText(s)
        }
        inputRead.close()
        edtMessage.setText("")
    } catch (e: Exception) {
        e.printStackTrace()
    }
}
}
}

```

--> Write an Android Program to demonstrate the working of Color, Style, Strings & Drawables.

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:background="@color/colorRed"
            android:text="This is color Red"
            android:textColor="@color/colorBlue"
            android:textSize="25dp"/>
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="This is color blue"
            android:textSize="25dp"
            android:textColor="@color/colorRed"
            android:background="@color/colorBlue"/>
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/Heading"
            android:textSize="25dp"/>
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/Description"
            android:textSize="25dp"/>
        <ImageView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:src="@drawable/triangle"/>
        <ImageView
            android:layout_width="wrap_content"
```

```

        android:layout_height="wrap_content"
        android:src="@drawable/rectangle"/>
    <ImageView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/circle"/>
    </LinearLayout>
</ScrollView>

```

strings.xml

```

<resources>
    <string name="app_name">My Application</string>
    <string name="Heading">Hello World</string>
    <string name="Description">This is string.xml and here we can create new strings
which can be used in our application</string>
</resources>

```

colors.xml

```

<?xml version="1.0" encoding="utf-8"?>
<resources>
    <color name="purple_200">#FFBB86FC</color>
    <color name="purple_500">#FF6200EE</color>
    <color name="purple_700">#FF3700B3</color>
    <color name="teal_200">#FF03DAC5</color>
    <color name="teal_700">#FF018786</color>
    <color name="black">#FF000000</color>
    <color name="white">#FFFFFFFF</color>
    <color name="colorPrimary">#008577</color>
    <color name="colorPrimaryDark">#00574B</color>
    <color name="colorAccent">#D81B60</color>
    <color name="colorRed">#FF0000</color>
    <color name="colorBlue">#0000FF</color>
</resources>

```

themes.xml

```

<resources xmlns:tools="http://schemas.android.com/tools">
    <!-- Base application theme. -->
    <style name="Theme.Pr7" parent="Theme.MaterialComponents.DayNight.DarkActionBar">

```

```

<!-- Primary brand color. -->
<item name="colorPrimary">@color/purple_500</item>
<item name="colorPrimaryVariant">@color/purple_700</item>
<item name="colorOnPrimary">@color/white</item>
<!-- Secondary brand color. -->
<item name="colorSecondary">@color/teal_200</item>
<item name="colorSecondaryVariant">@color/teal_700</item>
<item name="colorOnSecondary">@color/black</item>
<!-- Status bar color. -->
<item name="android:statusBarColor">?attr/colorPrimaryVariant</item>
<!-- Customize your theme here. -->
<item name="android:background">#00F0EF</item>
<item name="android:textColor">#000000</item>
</style>
</resources>

```

----- Practical 8 -----

-->Write an Android program to demonstrate the concept of Widgets in Flutter.

main.dart

```

import 'package:flutter/material.dart';
void main(){
  runApp( const MyApp());
}
class MyApp extends StatelessWidget {
  const MyApp({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        appBar: AppBar(title: const Text("login"),),
        body: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          children: const [
            Text(
              'Flutter practical',
              style: TextStyle(fontWeight: FontWeight.bold,fontSize: 30),
            ),
            SizedBox(
              height: 30,

```

```

    ),
    ElevatedButton(onPressed:null, child: Text('login',style:TextStyle(fontSize: 30),)
    ),
    Image(image:
NetworkImage("https://images.unsplash.com/photo-1676446547562-613597f00cf7?ixlib=rb-4.0.
3&ixid=MnwxMjA3fDB8MHxwaG90by1wYWdlfHx8fGVufDB8fHx8&auto=format&fit=crop&w=46
4&q=80"))
    ],
    ),
    ),
    );
  }
}

```

----- Practical 9 -----

-->Write an Android program to demonstrate the concept of Layouts in Flutter.

main.dart

```

import 'package:flutter/material.dart';
void main() {
  runApp(const MyApp());
}
class MyApp extends StatelessWidget {
  const MyApp({Key? key}): super(key:key);
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Layout Demo',
      home: Scaffold(
        appBar: AppBar(
          title:const Text('Layout Demo'),
        ),
        body: Center(
          child: Column(
            mainAxisAlignment: MainAxisAlignment.center,
            children: [
              const Text('This is a column'),
              const SizedBox(height: 20),
              Row(
                mainAxisAlignment: MainAxisAlignment.spaceAround,

```

```

        children: [
          Container(
            height: 50,
            width: 50,
            color: Colors.blue,
          ),
          Container(
            height: 50,
            width: 50,
            color: Colors.red,
          ),
          Container(
            height: 50,
            width: 50,
            color: Colors.green,
          ),
        ],
      ),
      const SizedBox(height: 20),
      Expanded(
        child: Container(
          color: Colors.yellow,
          child: const Center(
            child: Text('This is an expanded container'),
          ),
        ),
      ),
    ],
  ),
);
}
}

```

----- Practical 10 -----

-->Write an Android program to demonstrate the concept of Gestures in Flutter

main.dart

```

import 'package:flutter/material.dart';
void main() => runApp(const GestureDemo());
class GestureDemo extends StatefulWidget {
  const GestureDemo({Key? key}) : super(key: key);
  @override
  _GestureDemoState createState() => _GestureDemoState();
}
class _GestureDemoState extends State<GestureDemo> {
  String _gestureStatus = "";
  void _onTap() {
    setState(() {
      _gestureStatus = 'Tapped!';
    });
  }
  void _onDoubleTap() {
    setState(() {
      _gestureStatus = 'Double Tapped!';
    });
  }
  void _onLongPress() {
    setState(() {
      _gestureStatus = 'Long Pressed!';
    });
  }
  void _onVerticalDragStart(DragStartDetails details) {
    setState(() {
      _gestureStatus = 'Drag started vertically!';
    });
  }
  void _onVerticalDragUpdate(DragUpdateDetails details) {
    setState(() {
      _gestureStatus = 'Dragging vertically!';
    });
  }
  void _onVerticalDragEnd(DragEndDetails details) {
    setState(() {
      _gestureStatus = 'Drag ended vertically!';
    });
  }
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(

```



```

appBar: AppBar(
  title: const Text('Gesture Demo'),
),
body: Column(
  mainAxisAlignment: MainAxisAlignment.center,
  children: <Widget>[
    GestureDetector(
      onTap: _onTap,
      onDoubleTap: _onDoubleTap,
      onLongPress: _onLongPress,
      onVerticalDragStart: _onVerticalDragStart,
      onVerticalDragUpdate: _onVerticalDragUpdate,
      onVerticalDragEnd: _onVerticalDragEnd,
      child: Container(
        height: 200,
        color: Colors.blueGrey,
        child: Center(
          child: Text(
            _gestureStatus,
            style: const TextStyle(fontSize: 24),
          ),
        ),
      ),
    ],
  ),
);
}

```