

Experiment 03

Write program to implement frame layout, table layout and relative layout

Learning Objective: Students should be able to write a program to implement frame layout, table layout and relative layout.

Tools: Android Studio

Theory:

Android Studio:

Android Studio is the official integrated development environment (IDE) for Android application development. It is based on the IntelliJ IDEA, a Java integrated development environment for software, and incorporates its code editing and developer tools. To support application development within the Android operating system, Android Studio uses a Gradle- based build system, emulator, code templates, and GitHub integration. It is an open source software platform and operating system for mobile devices which is based on the Linux kernel. It was developed by Google and later by the Open Handset Alliance (OHA). It allows writing managed code in the Java language and Kotlin language. It has its own virtual machine i.e. DVM (Dalvik Virtual Machine), which is used for executing the android application.

To navigate transitions between stages of the activity lifecycle, the Activity class provides a core set of six callbacks: onCreate(), onStart(), onResume(), onPause(), onStop(), and onDestroy(). The system invokes each of these call-backs as an activity enters a new state. As the user begins to leave the activity, the system calls methods to dismantle the activity.

Table Layout:

It is a layout that consists of rows and columns. It is further divided as TableRow objects, each defining a row and layout. A layout that arranges its children horizontally. A TableRow should always be used as a child of a TableLayout. If a TableRow's parent is not a TableLayout, the TableRow will behave as a horizontal LinearLayout. The children of a TableRow do not need to specify the layout_width and layout_height attributes in the XML file. TableRow always enforces those values to be respectively View Group.Layout Params .MATCH_PARENT and View Group .Layout Params. WRAP_CONTENT. TableLayout containers do not display border lines for their rows, columns, or cells. Each row has zero or more cells; each cell can hold one View object. The table has as many columns as the row with the most cells. A table can leave cells empty. Cells can span columns, as they can in HTML.

Frame Layout:

It is one of the simplest layouts to organize view controls. Frame Layout is designed to block out an area on the screen to display a single item. Generally, FrameLayout should be used to hold a single child view, because it can be difficult to organize child views in a way that's scalable to different screen sizes without the children overlapping each other. We can add multiple children to a FrameLayout and control their position by assigning gravity to each child, using the android:layout_gravity attribute.

Relative Layout:

RelativeLayout is a view group that displays child views in relative positions. The position of each view can be specified as relative to sibling elements (such as to the left-of or below another view) or in positions relative to the parent RelativeLayout area (such as aligned to the bottom, left or center). It is a very powerful utility for designing a user interface because it can eliminate nested view groups and keep your layout hierarchy flat, which improves performance. If you find yourself using several nested LinearLayout groups, you may be able to replace them with a single RelativeLayout. The Relative Layout is a very flexible layout used in android for custom layout designing. It gives us the flexibility to position our component/view based on the relative or sibling component's position. Just because it allows us to position the component anywhere we want so it is considered the most flexible layout.

Implementation:

MainActivity.java

```
package com.example.experiment3;
import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```

activity_main.xml

<pre><?xml version="1.0" encoding="utf-8"?> <LinearLayout 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" android:orientation="vertical"> <RelativeLayout</pre>	<pre> android:layout_width="wrap_content" android:layout_height="wrap_content"> <TextView android:id="@+id/heading" android:layout_width="match_parent" android:layout_height="40dp" android:layout_below="@id/header" android:background="#00BCD4" android:gravity="center" android:text="TE COMP C Students" android:textColor="@color/white" android:textSize="24sp" android:textStyle="bold" /></pre>
--	---

```
<TableLayout android:id="@+id/table"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@id/heading"
    android:layout_alignParentEnd="true"
    android:layout_marginTop="0dp"
    android:layout_marginEnd="0dp"
    android:background="@color/white">

<TableRow
    android:layout_width="wrap_content"
    android:layout_height="wrap_content">

    <TextView
        android:layout_width="50dp"
        android:layout_height="wrap_content"
        android:layout_column="1"
        android:gravity="center"
        android:padding="5dp"
        android:text="Sem"
        android:textColor="@color/black"
        android:textSize="14sp"
        android:textStyle="bold"/>

    <TextView
        android:layout_width="80dp"
        android:layout_height="match_parent"
        android:layout_column="1"
        android:gravity="center"
        android:padding="5dp"
        android:text="Elective"
        android:textColor="@color/black"
        android:textSize="14sp"
        android:textStyle="bold"/>

    <TextView
        android:layout_width="64dp"
        android:layout_height="match_parent"
        android:layout_column="1"
        android:gravity="center"
        android:padding="5dp"
        android:text="CGPA"
        android:textColor="@color/black"
        android:textSize="14sp"
        android:textStyle="bold"/>

    <TextView
        android:layout_width="70dp"
        android:layout_height="match_parent"
        android:layout_column="1"
        android:gravity="center"
        android:text="Roll No."
        android:textColor="@color/black"
        android:textSize="14sp"
        android:textStyle="bold"/>

    <TextView
        android:layout_width="130dp"
        android:layout_height="match_parent"
        android:layout_column="1"
        android:gravity="center"
        android:padding="5dp"
        android:text="Name"
        android:textColor="@color/black"
        android:textSize="14sp"
        android:textStyle="bold"/>

    <TextView
        android:layout_width="70dp"
        android:layout_height="match_parent"
        android:layout_column="1"
        android:gravity="center"
        android:text="Semester"
        android:textColor="@color/black"
        android:textSize="14sp"
        android:textStyle="bold"/>
```


<pre> android:padding="5dp" android:text="1." android:textColor="@color/black" /> <TextView android:layout_width="130dp" android:layout_height="wrap_content" android:layout_column="1" android:gravity="center" android:padding="5dp" android:text="Karthik Shetty" android:textColor="@color/black" /> <TextView android:layout_width="70dp" android:layout_height="match_parent" android:layout_column="1" android:gravity="center" android:padding="5dp" android:text="ML" android:textColor="@color/black" /> <TextView android:layout_width="80dp" android:layout_height="match_parent" android:layout_column="1" android:gravity="center" android:padding="5dp" android:text="IV" android:textColor="@color/black" /> <TextView android:layout_width="64dp" android:layout_height="match_parent" android:layout_column="1" android:gravity="center" </pre>	<pre> android:padding="5dp" android:text="9.6" android:textColor="@color/black" /> </TableRow> <TableRow> <TextView android:layout_width="wrap_content" android:layout_height="wrap_content" android:textColor="@color/black" android:layout_column="1" android:gravity="center" android:padding="5dp" android:text="2." /> <TextView android:layout_width="130dp" android:layout_height="wrap_content" android:layout_column="1" android:gravity="center" android:padding="5dp" android:text="Ashutosh Sharma" android:textColor="@color/black" /> <TextView android:layout_width="70dp" android:layout_height="wrap_content" android:layout_column="1" android:gravity="center" android:padding="5dp" android:text="MP" android:textColor="@color/black" /> <TextView </pre>
---	--

android:layout_width="80dp"

```

android:layout_height="wrap_content"
    android:layout_column="1"
    android:gravity="center"
    android:padding="5dp"
    android:text="IV"
    android:textColor="@color/black"
/>

<TextView
    android:layout_width="64dp"
    android:layout_height="wrap_content"
    android:layout_column="1"
    android:gravity="center"
    android:padding="5dp"
    android:text="9.5"
    android:textColor="@color/black"
/>
</TableRow>
</TableLayout>
</RelativeLayout>

<RelativeLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_below="@id/table">

    <FrameLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginStart="150dp"
            android:layout_marginTop="310dp"
            android:backgroundTint="#F44336"
            android:elevation="12dp"
            android:text="ADD"
            android:textColor="@color/black"
            android:textStyle="bold"
            app:cornerRadius="8dp" />

        <ImageView
            android:id="@+id/header"
            android:layout_width="match_parent"
            android:layout_height="312dp"
            android:background="@color/black"
            app:srcCompat="@drawable/attendance"></Ima
geView>


        </FrameLayout>

    </RelativeLayout>

</RelativeLayout>

```

Design:

TE COMP C Students			
Roll No.	Name	Subject	Sem
18	Karthik Shetty	CSS	VI
13	Ashutosh Sharma	IP	VI
			

Result and Discussion: We successfully implemented a program to execute a program on Android Studio and executed a program to display table and frame in a relative layout.

Learning Outcomes: The student should have the ability to
LO1: explain different types of layout designs in Android Studio.
LO2: execute a simple program on each layout.

Course Outcomes: Upon completion of the course students will be able to execute a simple programs illustrating the use of different layout structures in Android.

Conclusion: We understood the concept of Frame Layout and Table Layout and how they are used to design different content in the application. We also learned and implemented Relative Layout and executed it through a program. Several concepts related to Android Application Development were revised while performing this experiment.

For Faculty Use

Correction Parameters	Formative Assessment [40%]	Timely completion of Practical [40%]	Attendance / Learning Attitude [20%]	
Marks Obtained				