1:print HelloWorld!
activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayoutxmlns: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">
<TextView
android:layout_width="wrap_content"
 android:layout_height="wrap_content" android:text="Hello World!"
app:layout_constraintBottom_toBottomOf="parent"
 app:layout_constraintLeft_toLeftOf="parent"
app:layout_constraintRight_toRightOf="parent"
 app:layout_constraintTop_toTopOf="parent" />
</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```java
package com.example.helloworld;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity; public class MainActivity extends
AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main); }
}
```

2: Design a Login Form with username and password using LinearLayout and toast valid credentials
activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">
<LinearLayout android:layout_width="395dp"
 android:layout_height="715dp"
android:orientation="vertical"
 tools:layout_editor_absoluteX="8dp"
tools:layout_editor_absoluteY="8dp">
<TextView
android:id="@+id/textView"
```

```xml
android:layout_width="match_parent"
 android:layout_height="wrap_content"
android:text="Username" />
<EditText
android:id="@+id/editText" android:layout_width="match_parent"
android:layout_height="wrap_content" android:ems="10"
android:inputType="textPersonName" android:text="Username" />
<TextView android:id="@+id/textView2"
 android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="password" />
<EditText
android:id="@+id/editText3"
android:layout_width="match_parent"
android:layout_height="wrap_content"
 android:ems="10" android:inputType="textPassword" />
<Button
android:id="@+id/button" android:layout_width="match_parent"
android:layout_height="wrap_content" android:text="Login" />
</LinearLayout> </android.support.constraint.ConstraintLayout>
```

MainActivity.java

```java
package com.example.loginToast;
import android.support.v7.app.AppCompatActivity; import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;; import android.widget.Toast;
public class MainActivity extends AppCompatActivity { EditText e1, e2;
Button b1;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState); setContentView(R.layout.activity_main);
b1 = (Button) findViewById(R.id.button);
e1 = (EditText) findViewById(R.id.editText);
e2 = (EditText) findViewById(R.id.editText3); b1.setOnClickListener(new View.OnClickListener()
{
public void onClick(View v) {
if (e1.getText().toString().equals("admin") &&
e2.getText().toString().equals("admin")) Toast.makeText(getApplicationContext(),
"Redirecting", Toast.LENGTH_LONG) .show();
else Toast.makeText(getApplicationContext(), "invalid",
Toast.LENGTH_LONG)
.show(); }
}); }
```

3: Write a program that demonstrates Activity Lifecycle.

activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?> <android.support.constraint.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">
<LinearLayout android:layout_width="395dp"
 android:layout_height="715dp"
android:orientation="vertical"
 tools:layout_editor_absoluteX="8dp"
 tools:layout_editor_absoluteY="8dp">
<TextView
android:id="@+id/textView"
android:layout_width="match_parent"
android:layout_height="wrap_content"
 android:text="Activity life cycle" />
</LinearLayout> </android.support.constraint.ConstraintLayout>
```

MainActivity.java

```java
package com.example.activitylifecycle;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
 setContentView(R.layout.activity_main);

Log.d("Activity_Lifecycle","onCreate invoked");
Toast.makeText(MainActivity.this,"Created",Toast.LENGTH_SHORT).show(); }
@Override
protected void onStart() {
super.onStart();
Log.d("Activity_Lifecycle","onStart invoked");
Toast.makeText(MainActivity.this,"Start",Toast.LENGTH_SHORT).show();
}
@Override
protected void onResume() {
super.onResume();
Log.d("Activity_Lifecycle","onResume invoked");
Toast.makeText(MainActivity.this,"Resume",Toast.LENGTH_SHORT).show();
```

```
}
@Override
protected void onPause() {
super.onPause();
Log.d("Activity_Lifecycle","onPause invoked");
Toast.makeText(MainActivity.this,"Pause",Toast.LENGTH_SHORT).show();
}
@Override
protected void onStop() {
super.onStop();
Log.d("Activity_Lifecycle","onStop invoked");
Toast.makeText(MainActivity.this,"Stop",Toast.LENGTH_SHORT).show();
}
@Override
protected void onRestart() {
super.onRestart();
Log.d("Activity_Lifecycle","onRestart invoked");
Toast.makeText(MainActivity.this,"Restart",Toast.LENGTH_SHORT).show();
}
@Override
protected void onDestroy() {
super.onDestroy();
Log.d("Activity_Lifecycle","onDestroy invoked");
Toast.makeText(MainActivity.this,"Destroy",Toast.LENGTH_SHORT).show();
}
```

4: Implementing basic arithmetic operations of a simple calculator.
activity_main.xml

```
<?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">
<TextView
android:id="@+id/textView1"
 android:layout_width="wrap_content"
android:layout_height="wrap_content"
 android:text="Calculator" tools:layout_editor_absoluteX="151dp"
tools:layout_editor_absoluteY="43dp" />
<TextView
android:id="@+id/textView2"
android:layout_width="wrap_content"
```

```xml
        android:layout_height="wrap_content"
        android:text="Enter no1" tools:layout_editor_absoluteX="56dp"
        tools:layout_editor_absoluteY="100dp"/>
    <EditText
        android:id="@+id/no1" android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10" android:inputType="number"
         tools:layout_editor_absoluteX="154dp"
        tools:layout_editor_absoluteY="91dp" />
    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:text="Enter no2" tools:layout_editor_absoluteX="59dp"
        tools:layout_editor_absoluteY="165dp" />

    <EditText
        android:id="@+id/no2" android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10" android:inputType="number"
        tools:layout_editor_absoluteX="154dp" tools:layout_editor_absoluteY="149dp" />
    <TextView
        android:id="@+id/textView4"
         android:layout_width="99dp"
         android:layout_height="29dp"
        android:text="Result:" tools:layout_editor_absoluteX="28dp"
         tools:layout_editor_absoluteY="414dp" />
    <TextView
        android:id="@+id/result" android:layout_width="161dp"
        android:layout_height="26dp" android:text=""
        tools:layout_editor_absoluteX="163dp"
         tools:layout_editor_absoluteY="414dp" />
    <Button
        android:id="@+id/add" android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:text="+" tools:layout_editor_absoluteX="116dp"
         tools:layout_editor_absoluteY="244dp" />
    <Button
        android:id="@+id/sub" android:layout_width="wrap_content"
        android:layout_height="wrap_content" android:text="-"
         tools:layout_editor_absoluteX="261dp"
         tools:layout_editor_absoluteY="244dp" />
    <Button
        android:id="@+id/mult"
```

```xml
android:layout_width="wrap_content"
android:layout_height="wrap_content" android:text="*"
tools:layout_editor_absoluteX="119dp"
 tools:layout_editor_absoluteY="323dp" />
<Button
android:id="@+id/div" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:text="/"
 tools:layout_editor_absoluteX="261dp" tools:layout_editor_absoluteY="323dp" />
</LinearLayout>
```

MainActivity.java

```java
package com.example.simplecalc;
import androidx.appcompat.app.AppCompatActivity; import android.app.Activity;
import android.view.Menu;
import android.view.View;
import android.view.View.OnClickListener;
 import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.os.Bundle;
public class MainActivity extends AppCompatActivity { EditText n1,n2;
TextView res;
Button add,sub,multi,div;
double num1,num2,sum,subtract,product,quotient;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
n1 = (EditText) findViewById(R.id.no1);
n2 = (EditText) findViewById(R.id.no2);
res = (TextView) findViewById(R.id.result);
add = (Button) findViewById(R.id.add);
sub = (Button) findViewById(R.id.sub);
multi = (Button) findViewById(R.id.mult);
div = (Button) findViewById(R.id.div);
 add.setOnClickListener(new OnClickListener() {
@Override
public void onClick(View v) {
num1 = Double.parseDouble(n1.getText().toString()); num2 =
Double.parseDouble(n2.getText().toString());
sum = num1 + num2;
res.setText(Double.toString(sum));
} });
sub.setOnClickListener(new OnClickListener() {
@Override
```

```java
public void onClick(View v) {
num1 = Double.parseDouble(n1.getText().toString());
num2 = Double.parseDouble(n2.getText().toString());
 subtract = num1 - num2; res.setText(Double.toString(subtract));
} });
multi.setOnClickListener(new OnClickListener() {
@Override
public void onClick(View v) {
num1 = Double.parseDouble(n1.getText().toString());
num2 = Double.parseDouble(n2.getText().toString());
product = num1 * num2; res.setText(Double.toString(product));
}
});
div.setOnClickListener(new OnClickListener() {
@Override
public void onClick(View v) {
num1 = Double.parseDouble(n1.getText().toString());
num2 = Double.parseDouble(n2.getText().toString());
quotient = num1 / num2; res.setText(Double.toString(quotient));
} });
} }
```

5: Implement validations on various UI controls.

activity_main.xml

```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"
android:orientation="vertical" tools:context=".MainActivity">
<TextView
android:id="@+id/textView"
android:layout_width="223dp"
android:layout_height="78dp"
android:text="Form validation"
android:textSize="30dp"
app:layout_constraintBottom_toTopOf="@+id/editTextTextPersonName"
app:layout_constraintTop_toTopOf="parent" app:layout_constraintVertical_bias="0.5"
tools:layout_editor_absoluteX="97dp" />
<EditText
android:id="@+id/editTextTextPersonName"
 android:layout_width="wrap_content"
```

```xml
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="textPersonName"
    android:hint="UserName"
    app:layout_constraintBottom_toTopOf="@+id/editTextTextEmailAddress"
    app:layout_constraintTop_toBottomOf="@+id/textView"
    app:layout_constraintVertical_bias="0.5"
    tools:layout_editor_absoluteX="97dp" />
<EditText
    android:id="@+id/editTextTextPassword2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="textPassword"
    app:layout_constraintBottom_toTopOf="@+id/editTextPhone"
    app:layout_constraintTop_toBottomOf="@+id/editTextTextEmailAddress"
    app:layout_constraintVertical_bias="0.5"

    tools:layout_editor_absoluteX="100dp" />
<EditText
    android:id="@+id/editTextTextEmailAddress"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="textEmailAddress"
    android:hint="EmailId" app:layout_constraintBottom_toTopOf="@+id/editTextTextPassword2"
    app:layout_constraintTop_toBottomOf="@+id/editTextTextPersonName"
    app:layout_constraintVertical_bias="0.5" tools:layout_editor_absoluteX="100dp" />
<EditText
    android:id="@+id/editTextPhone"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="phone"
    android:hint="Ph.No" app:layout_constraintBottom_toTopOf="@+id/button"
    app:layout_constraintTop_toBottomOf="@+id/editTextTextPassword2"
    app:layout_constraintVertical_bias="0.5" tools:layout_editor_absoluteX="111dp" />
<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Submit"
    android:layout_gravity="center"
```

```xml
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/editTextPhone"
    app:layout_constraintVertical_bias="0.5"
    tools:layout_editor_absoluteX="160dp" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```java
package com.example.userinterface;
import androidx.appcompat.app.AppCompatActivity;
 import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity
 {
 Button submit;
EditText name, email, password,contact;
// one boolean variable to check whether all the text fields // are filled by the user, properly or not.
boolean isAllFieldsChecked = false;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState); setContentView(R.layout.activity_main);
submit = findViewById(R.id.button);
name = findViewById(R.id.editTextTextPersonName);
 email = findViewById(R.id.editTextTextEmailAddress);
password = findViewById(R.id.editTextTextPassword2);
 contact = findViewById(R.id.editTextPhone);
submit.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
isAllFieldsChecked = CheckAllFields();
if (isAllFieldsChecked)
Toast.makeText(MainActivity.this, "credentials are valid", Toast.LENGTH_SHORT).show();
} });
}
private boolean CheckAllFields() {
String pattern1= "[a-zA-z0-9._-]+@[a-z]+\\.+[a-z]+"; if (name.getText().toString().length() == 0)
 {
name.setError("This field is required");
return false; }
if (!name.getText().toString().matches("[a-zA-Z]+")) { name.setError("Characters only");
return false;
}
```

```
if (email.getText().toString().length() == 0) { email.setError("Email is required");
return false;
}
if(!email.getText().toString().matches(pattern1)){ email.setError("Invalid email id");
return false;
}
if (password.getText().toString().length() < 8) { password.setError("Password must have at least
8 characters"); return false;
}
if (!password.getText().toString().matches(".*[a-z].*")) {
password.setError("Password must contain at least one lowercase character");
return false; }
if (!password.getText().toString().matches(".*[A-Z].*")) {
password.setError("Password must contain at least one uppercase character"); return false;
}
if (!password.getText().toString().matches(".*[@#$%^&+=].*")) { password.setError("Password
must contain at least one special character"); return false;
}
if (contact.getText().toString().length()!= 10) { contact.setError("Invalid mobile number");
 return false;
}
if (!contact.getText().toString().matches(".*[0-9].*")) { contact.setError("This field contains only
digits"); return false;
}
return true; }}
```

6: Design a simple Calculator using Cascaded LinearLayout
activity_main.xml

```xml
<?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"
android:background="#25FFFC3B"
 android:orientation="vertical" tools:context="com.example.linearcalculator.MainActivity">
<LinearLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
 android:layout_weight="0.3"
android:orientation="horizontal"> <TextView
android:id="@+id/display"
 android:layout_width="match_parent"
android:layout_height="match_parent"
 android:background="#ecf0f1" android:textSize="30sp" />
```

```xml
</LinearLayout> <LinearLayout
android:layout_width="match_parent"
 android:layout_height="wrap_content" android:layout_weight="0.2"
android:orientation="horizontal"> <Button
android:id="@+id/buttonDel"
 android:layout_width="wrap_content"
android:layout_height="match_parent"
android:layout_margin="1dp" android:layout_weight="0.25"
 android:fontFamily="sans-serif-black"
android:text="clear"
android:textSize="34sp" />
<Button
android:id="@+id/buttoneql"
 android:layout_width="wrap_content"
 android:layout_height="match_parent"
 android:layout_margin="1dp"
android:layout_weight="0.25"
 android:fontFamily="sans-serif-black"
android:text="="
android:textSize="34sp" />
</LinearLayout>
<LinearLayout android:layout_width="match_parent"
android:layout_height="wrap_content"
 android:layout_weight="0.2"
 android:orientation="horizontal"> <Button
android:id="@+id/button1"
android:layout_width="wrap_content"
 android:layout_height="match_parent"
 android:layout_margin="1dp" android:layout_weight="0.25"
 android:fontFamily="sans-serif-black"
 android:text="1"
android:textSize="34sp" /> <Button
android:id="@+id/button2"
android:layout_width="wrap_content"
android:layout_height="match_parent"
android:layout_margin="1dp"
 android:layout_weight="0.25"
android:fontFamily="sans-serif-black"
android:text="2"
android:textSize="34sp" /> <Button
android:id="@+id/button3"
 android:layout_width="wrap_content"
android:layout_height="match_parent"
 android:layout_margin="1dp"
```

```xml
    android:layout_weight="0.25"
    android:fontFamily="sans-serif-black"
    android:text="3"
    android:textSize="34sp" /> <Button
    android:id="@+id/buttondiv"
    android:layout_width="wrap_content"
    android:layout_height="match_parent"
    android:layout_margin="1dp" android:layout_weight="0.25"
    android:fontFamily="sans-serif-black" android:text="/"
    android:textSize="34sp" />
    </LinearLayout> <LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_weight="0.2"
    android:orientation="horizontal">
    <Button
    android:id="@+id/button4"
    android:layout_width="wrap_content"
    android:layout_height="match_parent"
    android:layout_margin="1dp"
    android:layout_weight="0.25"
    android:fontFamily="sans-serif-black"
    android:text="4"
    android:textSize="34sp" /> <Button
    android:id="@+id/button5"
    android:layout_width="wrap_content"
    android:layout_height="match_parent" android:layout_margin="1dp"
    android:layout_weight="0.25"
    android:fontFamily="sans-serif-black"
    android:text="5"
    android:textSize="34sp" /> <Button
    android:id="@+id/button6"
    android:layout_width="wrap_content"
    android:layout_height="match_parent"
    android:layout_margin="1dp"
    android:layout_weight="0.25"
    android:fontFamily="sans-serif-black"
    android:text="6"
    android:textSize="34sp" />
    <Button
    android:id="@+id/buttonsub"
    android:layout_width="wrap_content"
    android:layout_height="match_parent"
    android:layout_margin="1dp"
```

```xml
        android:layout_weight="0.25"
        android:fontFamily="sans-serif-black"
        android:text="-"
        android:textSize="34sp" />
    </LinearLayout>
    <LinearLayout android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_weight="0.2"
        android:orientation="horizontal">
        <Button
        android:id="@+id/button7"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_margin="1dp"
        android:layout_weight="0.25"
        android:fontFamily="sans-serif-black"
        android:text="7"
        android:textSize="34sp" />
        <Button
        android:id="@+id/button8"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_margin="1dp"
        android:layout_weight="0.25"
        android:fontFamily="sans-serif-black" android:text="8"
        android:textSize="34sp" />
        <Button
        android:id="@+id/button9"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_margin="1dp" android:layout_weight="0.25"
        android:fontFamily="sans-serif-black" android:text="9"
        android:textSize="34sp" />
        <Button
        android:id="@+id/buttonmul"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_margin="1dp"
        android:layout_weight="0.25"
        android:fontFamily="sans-serif-black"
        android:text="*"
        android:textSize="34sp" />
    </LinearLayout>
    <LinearLayout android:layout_width="match_parent"
```

```xml
        android:layout_height="wrap_content"
        android:layout_weight="0.2"
        android:orientation="horizontal">
<Button
android:id="@+id/button0"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_margin="1dp"
        android:layout_weight="0.25"
        android:fontFamily="sans-serif-black"
        android:text="0"
        android:textSize="34sp" /> <Button
android:id="@+id/buttonDot"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_margin="1dp"
        android:layout_weight="0.25"
        android:fontFamily="sans-serif-black"
        android:text="."
        android:textSize="34sp" />
        <Button
android:id="@+id/buttonAdd"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:layout_margin="1dp"
        android:layout_weight="0.25"
        android:fontFamily="sans-serif-black"
        android:text="+"
        android:textSize="34sp" />
</LinearLayout>
</LinearLayout>
```

MainActivity.java

```java
package com.example.linearcalculator;
import android.support.v7.app.AppCompatActivity; import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import com.example.linearcalculator.R;
public class MainActivity extends AppCompatActivity {
double input1 = 0, input2 = 0;
TextView edt1;
boolean addition, substract, multiply, divide, remainder, decimal;
Button bt0, bt1, bt2, bt3, bt4, bt5, bt6, bt7, bt8, bt9, btadd, btmul, btsub, btdiv, btequal, btdel,
```

```java
btdot, btrem;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState); setContentView(R.layout.activity_main);
 bt0 = (Button) findViewById(R.id.button0);
 bt1 = (Button) findViewById(R.id.button1);
bt2 = (Button) findViewById(R.id.button2);
bt3 = (Button) findViewById(R.id.button3);
bt4 = (Button) findViewById(R.id.button4);
bt5 = (Button) findViewById(R.id.button5);
bt6 = (Button) findViewById(R.id.button6);
bt7 = (Button) findViewById(R.id.button7);
bt8 = (Button) findViewById(R.id.button8);
bt9 = (Button) findViewById(R.id.button9);
 btadd = (Button) findViewById(R.id.buttonAdd);
 btsub = (Button) findViewById(R.id.buttonsub);
 btmul = (Button) findViewById(R.id.buttonmul);
 btdiv = (Button) findViewById(R.id.buttondiv);
btequal = (Button) findViewById(R.id.buttoneql);
btdel = (Button) findViewById(R.id.buttonDel);
btdot = (Button) findViewById(R.id.buttonDot);
 edt1 = (TextView) findViewById(R.id.display);
bt1.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View v) {
edt1.setText(edt1.getText() + "1"); }
});
bt2.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
edt1.setText(edt1.getText() + "2"); }
});
bt3.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
edt1.setText(edt1.getText() + "3"); }
});
bt4.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
edt1.setText(edt1.getText() + "4"); }
});
bt5.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
```

```java
edt1.setText(edt1.getText() + "5"); }
});
bt6.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
edt1.setText(edt1.getText() + "6"); }
});
bt7.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View v) {
edt1.setText(edt1.getText() + "7"); }
});
bt8.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
edt1.setText(edt1.getText() + "8"); }
});
bt9.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
edt1.setText(edt1.getText() + "9"); }
});
bt0.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
edt1.setText(edt1.getText() + "0"); }
});
btadd.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View v) {
if (edt1.getText().length() != 0) {
input1 = Float.parseFloat(edt1.getText() + ""); addition = true;
decimal = false;
edt1.setText(null);
} }
});
btsub.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
if (edt1.getText().length() != 0) {
input1 = Float.parseFloat(edt1.getText() + ""); substract = true;
decimal = false;
edt1.setText(null);
} }
});
btmul.setOnClickListener(new View.OnClickListener() {
```

```java
@Override
public void onClick(View v) {
if (edt1.getText().length() != 0) {
input1 = Float.parseFloat(edt1.getText() + ""); multiply = true;
decimal = false;
edt1.setText(null);
} }
});
btdiv.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
if (edt1.getText().length() != 0) {
input1 = Float.parseFloat(edt1.getText() + ""); divide = true;
decimal = false;
edt1.setText(null);
} }
});
btequal.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View v) {
if (addition || substract || multiply || divide || remainder) {
input2 = Float.parseFloat(edt1.getText() + ""); }
if (addition) {
edt1.setText(input1 + input2 + ""); addition = false;
}
if (substract) {
edt1.setText(input1 - input2 + "");
substract = false; }
if (multiply) {
edt1.setText(input1 * input2 + ""); multiply = false;
}
if (divide) {
edt1.setText(input1 / input2 + "");
divide = false; }
if (remainder) {
edt1.setText(input1 % input2 + ""); remainder = false;
} }
});
btdel.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View v) {
edt1.setText(""); input1 = 0.0; input2 = 0.0;
} });
btdot.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View v) {
```

```
if (decimal) {
//do nothing or you can show the error
} else {
edt1.setText(edt1.getText() + "."); decimal = true;
}}
}); }
}
```

7: Develop an application that toggles image using FrameLayout. Source Code:
activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
 <android.support.constraint.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">
<FrameLayout
android:layout_width="395dp" android:layout_height="715dp"
app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent"
tools:layout_editor_absoluteY="8dp">
<ImageView android:id="@+id/imageView" android:layout_width="wrap_content"
android:layout_height="wrap_content" app:srcCompat="@drawable/pic1" />
</FrameLayout> </android.support.constraint.ConstraintLayout>
```

MainActivity.java

```java
package com.example.toggleimage;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
public class MainActivity extends AppCompatActivity { ImageView v1;
int flag = 0;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
 setContentView(R.layout.activity_main);
v1 = (ImageView) findViewById(R.id.imageView);
 v1.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
// TODO Auto-generated method stub
if (flag == 0) { v1.setImageResource(R.drawable.pic1); flag = 1;
} else if (flag == 1) { v1.setImageResource(R.drawable.pic2); flag = 2;
} else if (flag == 2) { v1.setImageResource(R.drawable.index); flag = 0;
}}
}); }
```

}
8: Implement Intent to navigate between multiple activities
activity_main.html

```
<?xml version="1.0" encoding="utf-8"?>
 <android.support.constraint.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">
<LinearLayout android:layout_width="395dp"
android:layout_height="715dp"
 android:orientation="vertical"
 tools:layout_editor_absoluteX="8dp"
 tools:layout_editor_absoluteY="8dp">
<Button
android:id="@+id/button1" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:text="Implicit"
tools:layout_editor_absoluteX="74dp" tools:layout_editor_absoluteY="252dp" />
<Button
android:id="@+id/button2" android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Explicit" tools:layout_editor_absoluteX="237dp"
 tools:layout_editor_absoluteY="252dp" />
</LinearLayout> </android.support.constraint.ConstraintLayout>
Activity_second.xml
<?xml version="1.0" encoding="utf-8"?> <android.support.constraint.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=".activity_second">
<TextView
android:id="@+id/textView" android:layout_width="wrap_content"
android:layout_height="0dp" android:layout_marginTop="316dp" android:text="Second
Activity" android:textSize="32sp" app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.498" app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />
</android.support.constraint.ConstraintLayout> Activity_second.java
package com.example.intent;
import android.support.v7.app.AppCompatActivity; import android.os.Bundle;
import android.widget.Toast;
public class activity_second extends AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
```

```java
super.onCreate(savedInstanceState); setContentView(R.layout.activity_second);
Toast.makeText(getApplicationContext(), "We are moved to second Activity",
Toast.LENGTH_LONG).show(); }
}
```

MainActivity.java

```java
package com.example.intent;
import android.content.Intent;
import android.net.Uri;
import android.support.v7.app.AppCompatActivity;
 import android.os.Bundle;
import android.view.View;
import android.widget.Button;
public class MainActivity extends AppCompatActivity { Button b1,b2;
@Override
protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main); b1=(Button)findViewById(R.id.button1);
b2=(Button)findViewById(R.id.button2); b2.setOnClickListener(new View.OnClickListener() {
} );
@Override
public void onClick(View v) {
Intent intent = new Intent(getBaseContext(),activity_second.class);
startActivity(intent); }
b1.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View v) {
Intent intent = new Intent(Intent.ACTION_VIEW);
intent.setData(Uri.parse("https://www.tutlane.com/tutorial/android/android-implicit-intents-
with-examples"));
startActivity(intent); }
}
);
}
}
```

9: Develop an android mobile application to display Option Menu and Context Menu.
activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">
<TextView
android:id="@+id/textView" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:text="long press"
tools:layout_editor_absoluteX="133dp" tools:layout_editor_absoluteY="409dp" />
```

```
</android.support.constraint.ConstraintLayout> menu _main.xml
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">
<item android:id="@+id/copy" android:title="copy"/>
<item android:id="@+id/select" android:title="select"/>
<item android:id="@+id/paste" android:title="paste"/>
</menu> menu_example.xml
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto">
 <item android:id="@+id/item1"
android:title="settings"
app:showAsAction="never"/> <item android:id="@+id/item2"
android:title="Download"
app:showAsAction="never"/> <item android:id="@+id/item3"
android:title="History"
app:showAsAction="never"/> </menu>
```

MainActivity.java

```java
package com.example.optioncontext;
import android.support.v7.app.AppCompatActivity;
 import android.os.Bundle;
import android.view.ContextMenu;
import android.view.Menu;
import android.view.MenuInflater;
 import android.view.MenuItem;
 import android.view.View;
import android.widget.TextView;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity
 { TextView t;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
 t=(TextView)findViewById(R.id.textView);
registerForContextMenu(t);
}
@Override
public void onCreateContextMenu(ContextMenu menu, View v,
ContextMenu.ContextMenuInfo menuInfo) {
super.onCreateContextMenu(menu, v, menuInfo);
MenuInflater inflater = getMenuInflater();
 inflater.inflate(R.menu.menu_main, menu);
 menu.setHeaderTitle("Select The Action");
```

```java
}
public boolean onContextItemSelected(MenuItem item){
if(item.getItemId()==R.id.copy){
Toast.makeText(getApplicationContext(),"copy",Toast.LENGTH_LONG).show();
}
else if(item.getItemId()==R.id.paste){
Toast.makeText(getApplicationContext(),"paste",Toast.LENGTH_LONG).show(); }else
if(item.getItemId()==R.id.select){
Toast.makeText(getApplicationContext(),"select",Toast.LENGTH_LONG).show(); }
else{
return false;
}
return true;
}
@Override
public boolean onCreateOptionsMenu(Menu menu) {
MenuInflater inflater = getMenuInflater();
 inflater.inflate(R.menu.menu_example,menu);
 return true;
}
public boolean onOptionsItemSelected(MenuItem item){ if(item.getItemId()==R.id.item1){
Toast.makeText(getApplicationContext(),"settings",Toast.LENGTH_LONG).show(); }
else if(item.getItemId()==R.id.item2){
Toast.makeText(getApplicationContext(),"Download",Toast.LENGTH_LONG).show();
}
else if(item.getItemId()==R.id.item3){
Toast.makeText(getApplicationContext(),"Download",Toast.LENGTH_LONG).show(); }else{
return false; }
return true; }
}
```

10: Develop an application using fragments.
activity_main.xml
```xml
<?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"
 android:orientation="vertical"
 tools:context=".MainActivity">
<LinearLayout android:layout_width="match_parent"
 android:layout_height="wrap_content">
```

```xml
<Button android:layout_width="wrap_content" android:layout_height="wrap_content"
android:layout_weight="1" android:id="@+id/btnfrag1" android:text="contact"/>
<Button android:layout_width="wrap_content" android:layout_height="wrap_content"
android:layout_weight="1" android:id="@+id/btnfrag2" android:text="status"/>
<Button android:layout_width="wrap_content" android:layout_height="wrap_content"
android:layout_weight="1" android:id="@+id/btnfrag3" android:text="calls"/>
</LinearLayout>
<FrameLayout android:layout_width="match_parent" android:layout_height="match_parent"
android:id="@+id/container"/>
```

fragment_1.xml
```xml
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
 android:background="#4E9727"
 tools:context=".Fragment1">
<ListView
android:id="@+id/phones"
 android:layout_width="match_parent"
android:layout_height="match_parent"/>
</FrameLayout> fragment_2.xml
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools=http://schemas.android.com/tools
 android:layout_width="match_parent"
android:layout_height="match_parent"
 android:background="#BA2828" tools:context=".Fragment2">
<TextView
android:text="Fragment2"
android:layout_width="match_parent"
 android:layout_height="match_parent" />
</FrameLayout> fragment_3.xml
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools=http://schemas.android.com/tools
android:layout_width="match_parent"
 android:layout_height="match_parent"
 tools:context=".Fragment3">
<TextView
android:id="@+id/textView"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Fragment3" />
```

```
</FrameLayout>
```

MainActivity.java

```java
package com.example.fragment;
import androidx.appcompat.app.AppCompatActivity;
 import androidx.fragment.app.Fragment;
import androidx.fragment.app.FragmentManager;
import androidx.fragment.app.FragmentTransaction;
import android.os.Bundle; import android.view.View;
 import android.widget.Button;
public class MainActivity extends AppCompatActivity { Button b1,b2,b3;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
 setContentView(R.layout.activity_main);
b1=findViewById(R.id.btnfrag1);
 b2=findViewById(R.id.btnfrag2);
 b3=findViewById(R.id.btnfrag3);
loadFragment(new Fragment1(), 0);
b1.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
loadFragment(new Fragment1(),1);
} });
b2.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View view) {
loadFragment(new Fragment2(),1); }
});
b3.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
loadFragment(new Fragment3(),1); }
}); }
public void loadFragment(Fragment fragment , int flag){ FragmentManager fm=
getSupportFragmentManager(); FragmentTransaction ft=fm.beginTransaction();
if (flag == 0)
ft.add(R.id.container,fragment); else
ft.replace(R.id.container,fragment); ft.commit();
} }
```

Fragment1.java

```java
package com.example.fragment;
import android.os.Bundle;
import androidx.fragment.app.Fragment;
import android.view.LayoutInflater;
```

```java
import android.view.View;
import android.view.ViewGroup;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.Toast;
public class Fragment1 extends Fragment implements AdapterView.OnItemClickListener {
public Fragment1() {
// Required empty public constructor
}
@Override
public View onCreateView(LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState) { // Inflate the layout for this fragment
View view=inflater.inflate(R.layout.fragment_1, container, false);
return view; }
@Override
public void onViewCreated(View view, Bundle savedInstanceState){
super.onViewCreated(view,savedInstanceState);
String[]contact={"pqd","abc","xyz"};
ListView ls= (ListView)view.findViewById(R.id.phones);
ArrayAdapter<String> adapter=new ArrayAdapter<>(getActivity(),
android.R.layout.simple_list_item_1,contact);
ls.setAdapter(adapter);
ls.setOnItemClickListener(this); }
@Override
public void onItemClick(AdapterView<?> adapterView, View view, int i, long l) {
if (i==0){ Toast.makeText(getActivity(),"pqd",Toast.LENGTH_SHORT).show();
}
if (i==1){
Toast.makeText(getActivity(),"abc",Toast.LENGTH_SHORT).show(); }
if (i==2){ Toast.makeText(getActivity(),"xyz",Toast.LENGTH_SHORT).show();
}}
}
```

Fragment2.java

```java
package com.example.fragment;
import android.os.Bundle;
import androidx.fragment.app.Fragment;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
public class Fragment2 extends Fragment {
public Fragment2() {
// Required empty public constructor
}
```

```java
@Override
public View onCreateView(LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState) { // Inflate the layout for this fragment
return inflater.inflate(R.layout.fragment_2, container, false); }
} Fragment3.java
package com.example.fragment;
import android.os.Bundle;
import androidx.fragment.app.Fragment;
import android.view.LayoutInflater; import android.view.View;
import android.view.ViewGroup;
public class Fragment3 extends Fragment {
public Fragment3() {
// Required empty public constructor
}
@Override
public void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState); }
@Override
public View onCreateView(LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState) { // Inflate the layout for this fragment
return inflater.inflate(R.layout.fragment_3, container, false); }
}
```

11: Develop an application that uses Array Adapter with list view.

activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools" android:layout_width="match_parent"
android:layout_height="match_parent" tools:context=".MainActivity">
<ListView
android:id="@+id/listView1" android:layout_width="395dp" android:layout_height="715dp"
tools:layout_editor_absoluteX="8dp" tools:layout_editor_absoluteY="8dp" />
</android.support.constraint.ConstraintLayout>
```

Item_new.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
 <android.support.constraint.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
android:layout_width="match_parent"
android:layout_height="match_parent"> <TextView
android:id="@+id/textView" android:layout_width="wrap_content"
android:layout_height="wrap_content" android:text="" android:layout_gravity="center" />
</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```java
package com.example.listview;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.ListView;
public class MainActivity extends AppCompatActivity { ListView l1;
String plist[] = {"Apple","Samsung","Redme","Infinix"}; @Override
protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main); l1=(ListView)findViewById(R.id.listView1);
ArrayAdapter<String> ArrayAdapter<String>(this,R.layout.item_new,R.id.textView,plist);
l1.setAdapter(arrayAdapter); }
}
```

12: Develop an application that use Grid View with images and display alert box on selection.
activity_main.xml
```xml
<?xml version="1.0" encoding="utf-8"?>
<GridView xmlns:android="http://schemas.android.com/apk/res/android"
android:id="@+id/gridview"
 android:layout_width="fill_parent"
 android:layout_height="fill_parent"
android:columnWidth="90dp"
android:numColumns="auto_fit"
 android:verticalSpacing="5dp"
android:horizontalSpacing="10dp"
android:stretchMode="columnWidth"
 android:gravity="center"/>
```

MainActivity.java
```java
package com.example.gridalertbox;
import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;
import android.content.DialogInterface;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.GridView;
public class MainActivity extends AppCompatActivity {
private AlertDialog.Builder builder;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
GridView gridview = (GridView) findViewById(R.id.gridview);
builder = new AlertDialog.Builder(this);
gridview.setAdapter(new ImageAdapter(this));
 gridview.setOnItemClickListener(new AdapterView.OnItemClickListener() {
```

```java
@Override
public void onItemClick(AdapterView<?> adapterView, View view, int i, long l) {
//
builder.setTitle("Alert Dialog")
.setMessage("Image no : " + (i + 1)+"selected") .setNegativeButton("ok", new
DialogInterface.OnClickListener() {
@Override
public void onClick(DialogInterface dialogInterface, int i) {
do nothing
AlertDialog alertDialog = builder.create();
alertDialog.show(); } }); } }
} });
ImageAdapter.java
package com.example.gridalertbox;
import android.content.Context;
import android.view.View;
import android.view.ViewGroup;
import android.widget.BaseAdapter;
import android.widget.GridView;
import android.widget.ImageView;
public class ImageAdapter extends BaseAdapter {
private Context mContext;
// Constructor
public ImageAdapter(Context c) {
mContext = c; }
public int getCount() { return mThumbIds.length;
}
public Object getItem(int position) {
return null; }
public long getItemId(int position) { return 0;
}
public View getView(int position, View convertView, ViewGroup parent) {
ImageView imageView; if (convertView == null) {
imageView = new ImageView(mContext); imageView.setLayoutParams(new
GridView.LayoutParams(140, 140));
imageView.setScaleType(ImageView.ScaleType.CENTER_CROP);
imageView.setPadding(2, 2, 2, 2); }
else {
imageView = (ImageView) convertView; }
imageView.setImageResource(mThumbIds[position]);
return imageView; }
public Integer[] mThumbIds = {
```

R.drawable.chrome, R.drawable.drive, R.drawable.facebook, R.drawable.gmail,
R.drawable.google, R.drawable.insta, R.drawable.netflix, R.drawable.meet,
R.drawable.classroom, R.drawable.prime,
};

13: Develop an android mobile application to implement alert dialougs.
activity_main.xml

```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">
<Button
android:id="@+id/alertBtn"
android:layout_width="wrap_content"
 android:layout_height="wrap_content"
android:text="Alert" app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```java
public class MainActivity extends AppCompatActivity {
Button btn;
AlertDialog.Builder builder;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
 setContentView(R.layout.activity_main);
btn = findViewById(R.id.alertBtn);
builder = new AlertDialog.Builder(this);
 btn.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
System.out.println("Btn clicked");
 builder.setTitle("Alert Dialog");
 builder.setMessage("AlertDialog opened");
builder.setNegativeButton("ok", new
DialogInterface.OnClickListener() { @Override
public void onClick(DialogInterface dialogInterface, int i) {
Toast.makeText(getApplicationContext(),"ok btn
clicked",Toast.LENGTH_SHORT).show(); }
});
```

```java
builder.setPositiveButton("close", new DialogInterface.OnClickListener() {
@Override
public void onClick(DialogInterface dialogInterface, int i) {
Toast.makeText(getApplicationContext(),"close btn clicked",Toast.LENGTH_SHORT).show();
} });
AlertDialog alertDialog = builder.create();
// alertDialog.setTitle("Alert Box");
 or builder.setTitle("Alert Dialog"); //for setting title of alert box
alertDialog.show(); }
}); }
}
```

14: Implement Navigation drawer.

activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
 <androidx.drawerlayout.widget.DrawerLayout
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" android:id="@+id/drawer">
<RelativeLayout android:layout_width="match_parent"
 android:layout_height="match_parent">
 <androidx.appcompat.widget.Toolbar
android:id="@+id/toolbar"
android:layout_width="match_parent"
 android:layout_height="wrap_content"
 android:background="#8000A6FF" app:titleTextColor="@color/black" />
</RelativeLayout>
<com.google.android.material.navigation.NavigationView android:id="@+id/navmenu"
android:layout_width="220dp" android:layout_height="match_parent"
android:layout_gravity="start" android:background="#D9FFFFFF"
app:itemIconTint="#191717" app:itemTextColor="@color/black"
app:menu="@menu/side_bar_menu" />
</androidx.drawerlayout.widget.DrawerLayout>
```

side_bar_menu.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"> <item
android:id="@+id/item1"
android:title="History" /> <item
android:id="@+id/item2"
android:title="Drafts" /> <item
android:id="@+id/item3"
android:title="logout" /> </menu>
```

MainActivity.java

```java
package com.example.navbar;
import androidx.annotation.NonNull;
import androidx.appcompat.widget.Toolbar;
import androidx.appcompat.app.ActionBarDrawerToggle; import
androidx.appcompat.app.AppCompatActivity;
import androidx.core.view.GravityCompat;
import androidx.drawerlayout.widget.DrawerLayout;
import android.os.Bundle;
import android.view.MenuItem;
import android.widget.Toast;
import com.google.android.material.navigation.NavigationView;
public class MainActivity extends AppCompatActivity {
private NavigationView nav;
private DrawerLayout drawerLayout;
private ActionBarDrawerToggle toggle;
Toolbar toolbar;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
initView();
toolbar = (Toolbar) findViewById(R.id.toolbar);
setSupportActionBar(toolbar);
toggle = new ActionBarDrawerToggle(this, drawerLayout, toolbar, R.string.nav_open,
R.string.nav_close);
drawerLayout.addDrawerListener(toggle);
toggle.syncState();
nav.setNavigationItemSelectedListener(new
NavigationView.OnNavigationItemSelectedListener() {
@Override
public boolean onNavigationItemSelected(@NonNull MenuItem item) {
Toast.makeText(MainActivity.this, item.getTitle()+" clicked", Toast.LENGTH_LONG).show();
drawerLayout.closeDrawer(GravityCompat.START);
false;
} });}
public void initView() {
nav = (NavigationView) findViewById(R.id.navmenu); drawerLayout = (DrawerLayout)
findViewById(R.id.drawer);
}}
```

15. Design a registration activity and store registration details in local memory of phone using Intents and SharedPreferences.

activity_main.xml

```xml
<?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"
android:orientation="vertical"
android:paddingHorizontal="20dp"
android:id="@+id/main_layout"
android:paddingVertical="10dp"
android:gravity="center"
tools:context=".Ques05Activity"> <TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Register Page"
android:textStyle="bold"
android:textColor="@color/black"
android:textSize="20sp"/>
<EditText
android:id="@+id/fullname"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:inputType="textPersonName"
android:layout_marginTop="30dp"
android:hint="Full Name"/> <EditText
android:id="@+id/emailid"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginTop="10dp"
android:inputType="textEmailAddress"
android:hint="Email ID"/>
<RadioGroup
android:id="@+id/gender_radioGroup"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginTop="10dp"
android:orientation="horizontal">
<RadioButton
android:id="@+id/male_gender"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Male"/>
<RadioButton
```

```xml
    android:id="@+id/female_gender"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginLeft="10dp"
    android:text="Female"/>
<RadioButton
    android:id="@+id/others_gender"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginLeft="10dp"
    android:text="Others"/> </RadioGroup>
<TextView
    android:id="@+id/gender_error"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:textColor="#ff0000"/>
<EditText
    android:id="@+id/password"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Password"
    android:inputType="textPassword"
    android:layout_marginTop="10dp"/>
<Button
    android:id="@+id/register_btn"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:text="Register"/>
</LinearLayout>
```

Activity.java

```java
package com.example.application;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.util.Patterns;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.LinearLayout;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.TextView;
```

```java
public class Ques05Activity extends AppCompatActivity {
EditText fullname, emailid, password; RadioGroup gender_radioGroup;
RadioButton male_gender, female_gender, others_gender; Button register_btn;
TextView gender_error; LinearLayout main_layout;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_ques05);
fullname= findViewById(R.id.fullname);
emailid= findViewById(R.id.emailid);
password= findViewById(R.id.password);
gender_radioGroup= findViewById(R.id.gender_radioGroup);
male_gender= findViewById(R.id.male_gender);
female_gender= findViewById(R.id.female_gender);
others_gender= findViewById(R.id.others_gender);
register_btn= findViewById(R.id.register_btn);
gender_error= findViewById(R.id.gender_error);
main_layout= findViewById(R.id.main_layout);
register_btn.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
fullname.setError(null); emailid.setError(null); gender_error.setText("");
password.setError(null);
```

Dept. Computer Applications

```java
String password_regex =
"^(?=.*[0-9])(?=.*[a-z])(?=.*[A-Z])(?=.*[@#$%^&+=])(?=\\S+$).{4,}$";
String fullname_text= fullname.getText().toString();
String emailid_text= emailid.getText().toString();
String password_text= password.getText().toString();
int gender_selected= gender_radioGroup.getCheckedRadioButtonId();
String gender="Not Available";
if(gender_selected==R.id.male_gender) gender="Male";
else if(gender_selected==R.id.female_gender) gender="Female";
else if(gender_selected==R.id.others_gender) gender="Others";
if(fullname_text.equals("")){ fullname.requestFocus();
fullname.setError("Please enter fullname !!"); }
else if(fullname_text.length() < 3){
fullname.requestFocus();
fullname.setError("Fullname should be more than 2 characters !!"); }
else if(emailid_text.equals("")){
emailid.requestFocus();
emailid.setError("Please enter email-id !!"); }
else if(!Patterns.EMAIL_ADDRESS.matcher(emailid_text).matches()){
emailid.requestFocus();
```

```java
emailid.setError("Please enter a valid email-id !!"); }
else if(gender_selected < 0){
gender_error.setText("Select anyone of the gender option !!"); }
else if(!password_text.matches(password_regex)){
password.requestFocus();
password.setError("Password should contain - \na digit must occur at least once\na
lower case
letter must occur at least once\nan upper case letter must occur at least once\na
special character like @#$%^&+=\nNo blank spaces allowed\natleast 6
characters");
} else{
SharedPreferences pref= getSharedPreferences("register_data",
MODE_PRIVATE); SharedPreferences.Editor pref_edit= pref.edit();
pref_edit.putString("reg_fullname",fullname_text);
pref_edit.putString("reg_emailid",emailid_text);
pref_edit.putString("reg_password",password_text);
pref_edit.putString("reg_gender",gender);
pref_edit.apply();
Intent intent= new Intent(getApplicationContext(),Ques05ResultActivity.class);
startActivity(intent);
}}
}); }
}
```

activity_result.xml

```xml
<?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"
android:orientation="vertical"
android:gravity="center"
android:padding="10dp"
tools:context=".Ques05ResultActivity"> <TextView
android:id="@+id/fullname_result"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="10dp"
android:text="Name : "/>
<TextView
android:id="@+id/emailid_result"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="10dp"
```

```
android:text="Name : "/>
<TextView
android:id="@+id/gender_result"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="10dp"
android:text="Gender : "/>
<TextView
android:id="@+id/password_result"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="10dp"
android:text="Password : "/> </LinearLayout>
```

ResultActivity.java

```
package com.example.application;
import androidx.appcompat.app.AppCompatActivity;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.widget.TextView;
public class Ques05ResultActivity extends AppCompatActivity {
TextView fullname_result, emailid_result, gender_result, password_result;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_ques05_result);
fullname_result= findViewById(R.id.fullname_result); emailid_result=
findViewById(R.id.emailid_result); gender_result=
findViewById(R.id.gender_result); password_result=
findViewById(R.id.password_result);
SharedPreferences pref= getSharedPreferences("register_data",
MODE_PRIVATE);
String name= pref.getString("reg_fullname","Not Available !!");
String email= pref.getString("reg_emailid","Not Available !!");
String password= pref.getString("reg_password","Not Available !!");
String gender= pref.getString("reg_gender","Not Available !!");
fullname_result.setText("Name : "+name); emailid_result.setText("Email ID :
"+email); gender_result.setText("Gender : "+gender);
password_result.setText("Password : "+password);
} }
```

16. Create a Facebook page using RelativeLayout; set properties using .xml file.

activity_main.xml
```
<?xml version="1.0" encoding="utf-8"?>
```

```xml
<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"
android:textAlignment="center"
tools:context=".MainActivity">
<RelativeLayout
android:layout_width="443dp"
android:layout_height="733dp"
android:background="@drawable/background"
tools:layout_editor_absoluteX="1dp"
tools:layout_editor_absoluteY="1dp">
<EditText
android:id="@+id/editTextTextPersonName3"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="40dp"
android:layout_marginBottom="585dp"
android:ems="10"
android:inputType="textPersonName"
android:text="Facebook"
android:textAlignment="center"
android:textSize="60sp" />
<EditText
android:id="@+id/editTextTextPersonName5"
android:layout_width="206dp"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="237dp"
android:layout_marginBottom="410dp"
android:ems="10"
android:inputType="textPersonName"
android:text="username"
android:textColor="@color/white"
android:textSize="34sp" />
<EditText
android:id="@+id/editTextTextPersonName6"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
```

```
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="228dp"
android:layout_marginBottom="328dp"
android:ems="10"
android:inputType="textPersonName"
android:text="password"
android:textColor="@color/white"
android:textSize="34sp" />
<EditText
android:id="@+id/editTextTextPassword"
android:layout_width="194dp"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="6dp"
android:layout_marginBottom="334dp"
android:ems="10"
android:inputType="textPassword" />
<Button
android:id="@+id/button"
android:layout_width="133dp"
android:layout_height="75dp"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="149dp"
android:layout_marginBottom="144dp"
android:text="Login" />
<EditText
android:id="@+id/editTextTextPersonName7"
android:layout_width="196dp"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="4dp"
android:layout_marginBottom="417dp"
android:ems="10"
android:inputType="textPersonName" />
</RelativeLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

17. Implement Adapters and perform exception handling.

xml

```xml
<xml version="1.0" encoding="utf-8">
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"android:layout_height="match_parent"
tools:context="MainActivity">
<ListView
android:id="@+id/list"android:layout_width="match_parent"
android:layout_height="match_parent"
android:layout_alignParentStart="true"
android:layout_marginStart="0dp">
</ListView></RelativeLayout>
```

Main_activity.java

```java
package com.example.exeception;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.Toast;
import java.util.ArrayList;
import java.util.List;
public class MainActivity extends AppCompatActivity {
List<String> list=new ArrayList();
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
list.add("ITEM 1");
list.add("ITEM 2");
list.add("ITEM 3");
list.add("ITEM 4");
for (int i=0;i<;5;i++){
try {
list.get(i);
}
catch(Exception e) {
Toast.makeText(this, "Exception caught",
Toast.LENGTH_LONG).show();
}
}}}
```

18. Develop an application that implements Spinner component and perform event handling.

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

```xml
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"
android:gravity="center"
android:orientation="vertical" tools:context=".Ques15Activity">
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Spinner &amp; Event Handling"
android:textStyle="bold"
```
Amal Jyothi College of Engineering, Kanjirappally 88

20MCA243 – Mobile Application Development Lab Dept. Computer Applications
```xml
android:textSize="20sp"
android:textColor="@color/black"/> <TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Choose your desired designation"
android:layout_marginTop="30dp" /> <Spinner
android:id="@+id/spinner"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="10dp"/>
</LinearLayout>
```

MainActivity.java
```java
package com.example.application;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle; import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Spinner; import android.widget.Toast;
public class Ques15Activity extends AppCompatActivity { Spinner spinner;
String[] designations = {"Front-End Developer", "Data Analyst", "Software Tester", "Software
Developer", "Programming Analyst", "Web Developer", "Mobile App Developer", "Business
Analyst", "Database Analyst"}; @Override protected void onCreate(Bundle savedInstanceState)
 { super.onCreate(savedInstanceState);
 setContentView(R.layout.activity_ques15); spinner= findViewById(R.id.spinner);
ArrayAdapter adapter = new ArrayAdapter(this, android.R.layout.simple_spinner_item,
designations);
adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_i tem);
spinner.setAdapter(adapter);
spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() { @Override
public void onItemSelected(AdapterView adapterView, View view, int i, long l) {
```

```java
Toast.makeText(getApplicationContext(), "Selected designation is : "+designations[i],
Toast.LENGTH_LONG).show();
}
@Override public void onNothingSelected(AdapterView adapterView) { } }); } }
```