

Mobile Application Development

Lab Assignments 1-4

1. Android App Life Cycle

MainActivity.java:

```
package com.example.lifecycle;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Toast.makeText(getApplicationContext(), "Created",
        Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onStart() {
        super.onStart();
        Toast.makeText(getApplicationContext(), "Started",
        Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onResume() {
        super.onResume();
        Toast.makeText(getApplicationContext(), "Resumed",
        Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onPause() {
        super.onPause();
        Toast.makeText(getApplicationContext(), "Paused",
        Toast.LENGTH_SHORT).show();
    }
}
```

```

    }

    @Override
    protected void onStop() {
        super.onStop();
        Toast.makeText(getApplicationContext(), "Stopped",
        Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onRestart() {
        super.onRestart();
        Toast.makeText(getApplicationContext(), "Restarted",
        Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        Toast.makeText(getApplicationContext(), "Destroyed",
        Toast.LENGTH_SHORT).show();
    }
}

```

activity_main.xml:

```

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android: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="Life Cycle App"
        android:textSize="25sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"

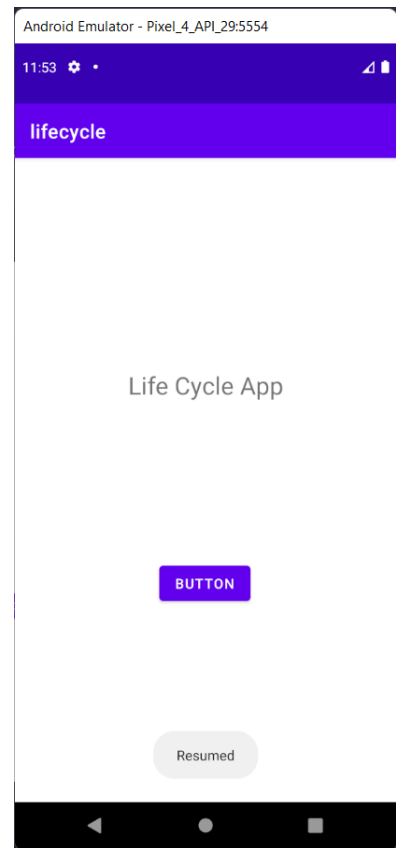
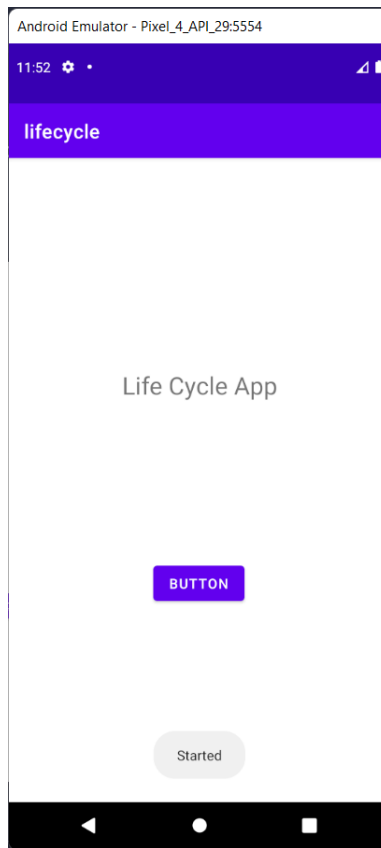
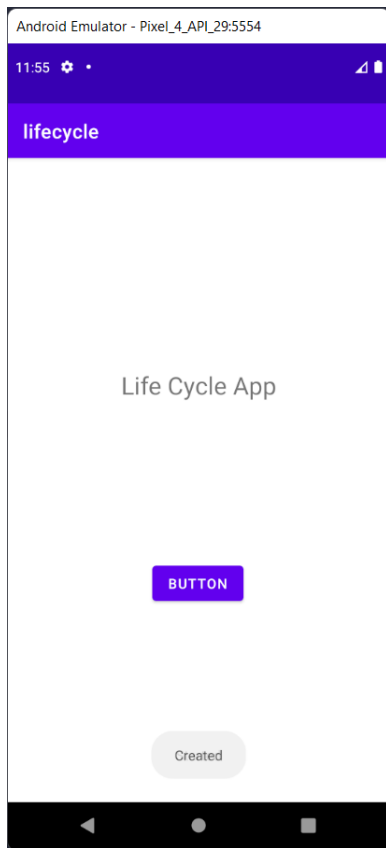
```

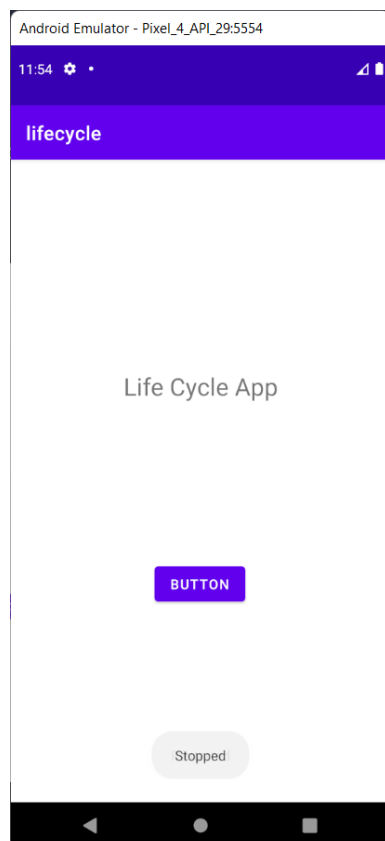
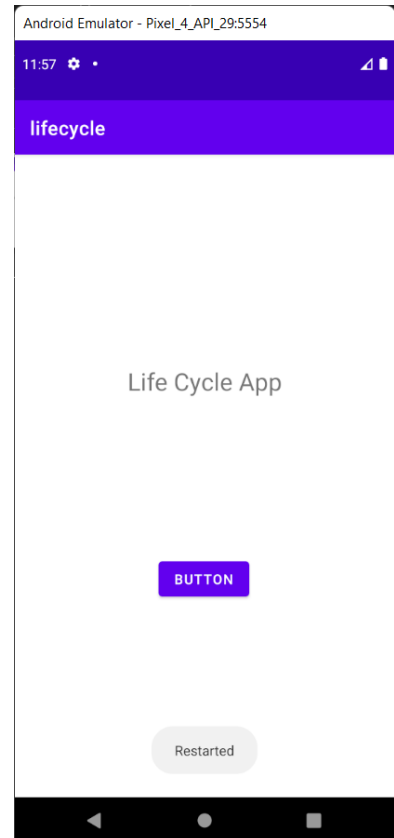
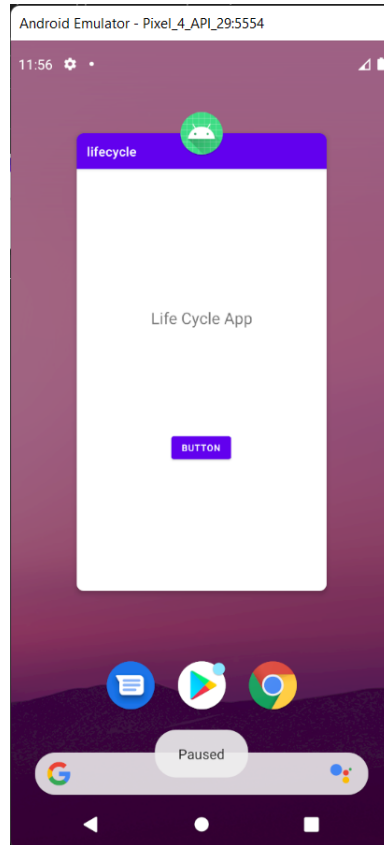
```
app:layout_constraintTop_toTopOf="parent"  
app:layout_constraintVertical_bias="0.345" />
```

```
<Button  
    android:id="@+id/button"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:gravity="center"  
    android:text="Button"  
    app:layout_constraintBottom_toBottomOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.498"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toTopOf="parent"  
    app:layout_constraintVertical_bias="0.673" />
```

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

Screenshots:





2. Linear Layout App - 1

MainActivity.java

```
package com.example.linearlayout;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

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

    public void showName(View view){
        EditText edit = (EditText) findViewById(R.id.editTextTextPersonName);
        String name = edit.getText().toString();
        String res = "Hello "+name+", how are you!";
        Toast.makeText(getApplicationContext(), res,
        Toast.LENGTH_SHORT).show();
    }
}
```

activity_main.xml:

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="48dp">
```

```
android:layout_marginBottom="20dp"  
android:text="Linear Layout App"  
android:textAlignment="center"  
android:textColor="@color/purple_700"  
android:textSize="36dp" />
```

```
<LinearLayout  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:layout_gravity="center"  
    android:layout_marginVertical="48dp"  
    android:orientation="horizontal"  
    android:paddingLeft="36dp"  
    android:paddingRight="36dp">
```

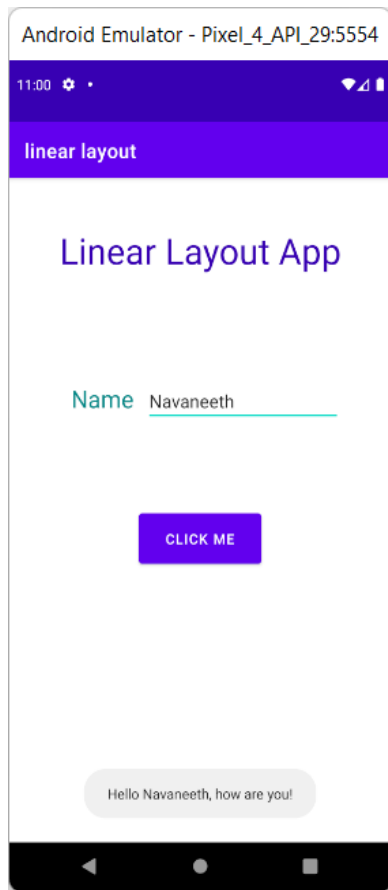
```
<TextView  
    android:id="@+id/textView2"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_marginHorizontal="12dp"  
    android:layout_marginVertical="36dp"  
    android:text="Name"  
    android:textColor="@color/design_default_color_secondary_variant"  
    android:textSize="24dp" />
```

```
<EditText  
    android:id="@+id/editTextTextPersonName"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_marginVertical="36dp"  
    android:ems="10"  
    android:hint="Enter you name"  
    android:inputType="textPersonName"  
    android:paddingVertical="10dp" />
```

```
</LinearLayout>
```

```
<Button  
    android:id="@+id/button"  
    android:layout_width="126dp"  
    android:layout_height="62dp"  
    android:layout_gravity="center"  
    android:onClick="showName"  
    android:text="Click Me" />  
</LinearLayout>
```

Screenshots:



3) Linear layout App - 2 Calculator

MainActivity.java

```
package com.example.ll2_calculator;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

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

    public void add(View view)
    {
        EditText num1 = (EditText) findViewById(R.id.editTextNumber3);
        EditText num2 = (EditText) findViewById(R.id.editTextNumber4);
        int a = Integer.parseInt(num1.getText().toString());
        int b = Integer.parseInt(num2.getText().toString());
        int res = a+b;
        Toast.makeText(getApplicationContext(), "Sum = "+res,
        Toast.LENGTH_SHORT).show();
    }

    public void sub(View view)
    {
        EditText num1 = (EditText) findViewById(R.id.editTextNumber3);
        EditText num2 = (EditText) findViewById(R.id.editTextNumber4);
        int a = Integer.parseInt(num1.getText().toString());
        int b = Integer.parseInt(num2.getText().toString());
        int res = a-b;
        Toast.makeText(getApplicationContext(), "Difference = "+res,
        Toast.LENGTH_SHORT).show();
    }

    public void multiply(View view)
    {

```



```

        EditText num1 = (EditText) findViewById(R.id.editTextNumber3);
        EditText num2 = (EditText) findViewById(R.id.editTextNumber4);
        int a = Integer.parseInt(num1.getText().toString());
        int b = Integer.parseInt(num2.getText().toString());
        int res = a*b;
        Toast.makeText(getApplicationContext(), "Product = "+res,
Toast.LENGTH_SHORT).show();
    }

```

```

    public void divide(View view)
    {
        EditText num1 = (EditText) findViewById(R.id.editTextNumber3);
        EditText num2 = (EditText) findViewById(R.id.editTextNumber4);
        float a = Integer.parseInt(num1.getText().toString());
        float b = Integer.parseInt(num2.getText().toString());
        float res = a/b;
        Toast.makeText(getApplicationContext(), "Quotient = "+res,
Toast.LENGTH_SHORT).show();
    }
}

```

Activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingLeft="16dp"
    android:paddingRight="16dp"
    android:orientation="vertical"
    android:layout_gravity="center"
    android:layout_centerHorizontal="true"
    android:layout_centerVertical="true">

    <TextView
        android:id="@+id/textView4"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="24dp"
        android:gravity="center"
        android:textSize="36sp"
        android:textColor="@color/purple_700"
        android:text="Mini Calculator" />

    <TextView

```

```
    android:id="@+id/textView5"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginHorizontal="75dp"
    android:layout_marginVertical="24dp"
    android:gravity="center"
    android:padding="8sp"
    android:text="Number 1"
    android:textAlignment="center"
    android:textColor="@color/purple_700"
    android:textSize="20dp" />
```

<EditText

```
    android:id="@+id/editTextNumber3"
    android:layout_width="156dp"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:ems="10"
    android:gravity="center"
    android:inputType="number"
    android:textAlignment="center"
    android:textColor="@color/black" />
```

<TextView

```
    android:id="@+id/textView6"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginVertical="24dp"
    android:layout_marginHorizontal="75dp"
    android:padding="8sp"
    android:gravity="center"
    android:textSize="20dp"
    android:textColor="@color/purple_700"
    android:textAlignment="center"
    android:text="Number 2" />
```

<EditText

```
    android:id="@+id/editTextNumber4"
    android:layout_width="165dp"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:ems="10"
    android:gravity="center"
    android:inputType="number"
    android:textColor="@color/black" />
```

```
<LinearLayout
    android:layout_width="382dp"
    android:layout_height="wrap_content"
    android:layout_marginVertical="20dp"
    android:orientation="horizontal"
    android:paddingLeft="16dp"
    android:paddingRight="16dp">
```

```
<Button
    android:id="@+id/button"
    android:layout_width="117dp"
    android:layout_height="65dp"
    android:layout_marginHorizontal="20dp"
    android:layout_marginVertical="24dp"
    android:gravity="center"
    android:onClick="add"
    android:text="+" />
```

```
<Button
    android:id="@+id/button7"
    android:layout_width="117dp"
    android:layout_height="65dp"
    android:layout_marginHorizontal="36dp"
    android:layout_marginVertical="24dp"
    android:onClick="sub"
    android:text="-" />
```

```
</LinearLayout>
```

```
<LinearLayout
    android:layout_width="382dp"
    android:layout_height="match_parent"
    android:paddingLeft="16dp"
    android:paddingRight="16dp"
    android:orientation="horizontal"
    android:layout_marginVertical="0dp">
```

```
<Button
    android:id="@+id/button4"
    android:layout_width="117dp"
    android:layout_height="65dp"
    android:layout_marginHorizontal="24dp"
    android:layout_marginVertical="24dp"
    android:gravity="center"
    android:text="*" />
```

```
android:onClick="multiply" />
```

```
<Button
```

```
android:id="@+id/button5"
```

```
android:layout_width="117dp"
```

```
android:layout_height="65dp"
```

```
android:layout_marginHorizontal="30dp"
```

```
android:layout_marginVertical="24dp"
```

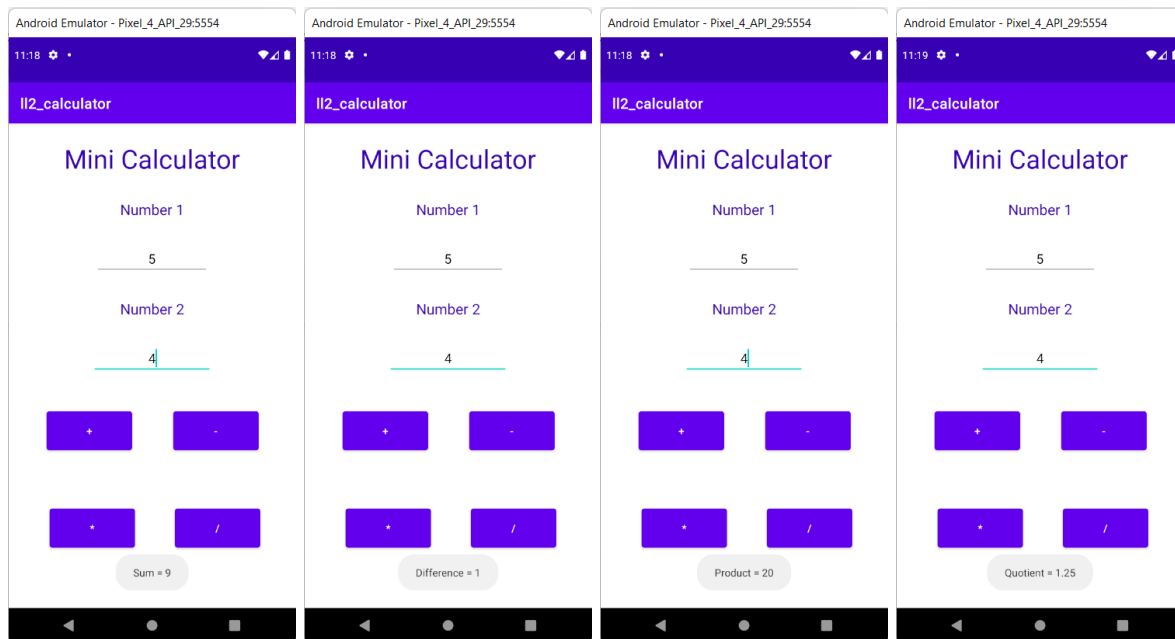
```
android:text="/"
```

```
android:onClick="divide" />
```

```
</LinearLayout>
```

```
</LinearLayout>
```

Screenshots:



4) Relative Layout: Buttons

MainActivity.java:

```
package com.example.rlaayout1;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

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

activity_main.xml:

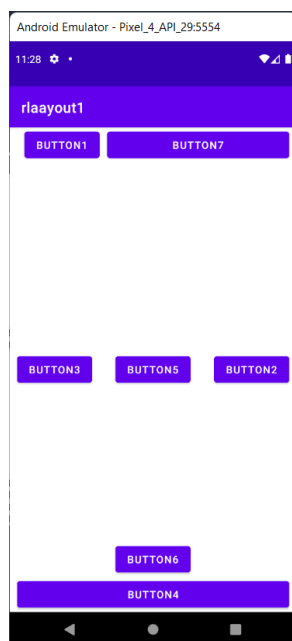
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingLeft="10dp"
    android:paddingRight="10dp">
    <Button
        android:id="@+id/btn1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_marginHorizontal="10dp"
        android:text="Button1" />
    <Button
        android:id="@+id/btn2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentRight="true"
        android:layout_centerVertical="true"
        android:text="Button2" />
    <Button
        android:id="@+id/btn3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_centerVertical="true"
```

```

        android:text="Button3" />
    <Button
        android:id="@+id/btn4"android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:text="Button4" />
    <Button
        android:id="@+id/btn5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBottom="@+id/btn2"
        android:layout_centerHorizontal="true"
        android:text="Button5" />
    <Button
        android:id="@+id/btn6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_above="@+id/btn4"
        android:layout_centerHorizontal="true"
        android:text="Button6" />
    <Button
        android:id="@+id/btn7"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentRight="true"
        android:layout_toEndOf="@+id/btn1"
        android:layout_toRightOf="@+id/btn1"
        android:text="Button7" />
</RelativeLayout>

```

Screenshots:



5) Relative Layout: Course Registration

MainActivity.java:

```
package com.example.rlayout2;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

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

    public void submitForm(View view)
    {
        EditText cn = (EditText) findViewById(R.id.editTextTextPersonName);
        EditText cid = (EditText) findViewById(R.id.editTextTextPersonName2);
        EditText name = (EditText)
findViewById(R.id.editTextTextPersonName3);EditText usn = (EditText)
findViewById(R.id.editTextTextPersonName4);
        String a = cn.getText().toString();
        String b = cid.getText().toString();
        String c = name.getText().toString();
        String d = usn.getText().toString();
        String res = "Course Name : "+a + "\nCourse Code : "+b + "\nName : "+c +
"\nUSN : "+d;
        Toast.makeText(getApplicationContext(), res, Toast.LENGTH_LONG).show();
    }
}
```

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"
    android:paddingLeft="10dp"
    android:paddingRight="10dp"
    android:layout_marginVertical="36dp">
```

>

```
<EditText
    android:id="@+id/editTextTextPersonName"
    android:layout_width="161dp"
    android:layout_height="wrap_content"
    android:layout_marginHorizontal="10dp"
    android:layout_marginVertical="20dp"
    android:ems="10"
    android:hint="Course Name"
    android:inputType="textPersonName" />
```

```
<EditText
    android:id="@+id/editTextTextPersonName2"
    android:layout_width="184dp"
    android:layout_height="wrap_content"
    android:layout_alignParentRight="true"
    android:layout_marginHorizontal="10dp"
    android:layout_marginVertical="20dp"
    android:layout_marginRight="14dp"
    android:ems="10"
    android:hint="Course Code"
    android:inputType="textPersonName" />
```

```
<EditText
    android:id="@+id/editTextTextPersonName3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBottom="@+id/editTextTextPersonName2"
    android:layout_centerInParent="true"
    android:layout_marginBottom="-108dp"
    android:ems="10"
    android:hint="Enter Name"
    android:inputType="textPersonName" />
```

```
<EditText
    android:id="@+id/editTextTextPersonName4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBottom="@+id/editTextTextPersonName3"
    android:layout_centerHorizontal="true"
    android:layout_marginBottom="-111dp"
    android:ems="10"
    android:inputType="textPersonName"
    android:hint="Enter USN" />
```



```

<Button
    android:id="@+id/button"
    android:layout_width="202dp"
    android:layout_height="78dp"
    android:layout_alignParentBottom="true"
    android:layout_centerInParent="true"
    android:layout_marginBottom="219dp"
    android:onClick="submitForm"
    android:text="Submit Form" />

</RelativeLayout>

```

Screenshots:

