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CSE-A
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LAB-3

Fragment to Show Courses Application Apk:
https://drive.google.com/file/d/19WlasWc2I94jDlsycrzvqzLzk5sWtzYw/view?usp=sharing

Mobile Application Development Laboratory – 3

Experiment Name: Working With Fragments

Date: 22-02-2021

Aim: Design an Android application using Android Studio with the following specifications.
i) In an activity, include the Title, Textbox and a button. Where the user types his/her roll number in the textbox and upon clicking the button, initiates the first fragment and displays the information using toasts.
ii) First fragment will display the welcome message with the roll number of the student and it should have a Checkbox button which displays a list of courses and a button. User has to select a set of courses from the radio buttons and click on the button.
iii)Upon clicking the button in the first fragment, initiate the second fragment and display the selected courses with the roll number.

Description of App: (The detailed working can be seen in screenshots)
We have an main Activity where we have an input for roll number and submit button and
We need to make 2 fragments fragment-1 for selecting the courses there from the checkbox and fragment-2 for displaying the courses selected from the checkbox along with the roll number.The transitions between the fragments here are greeted by toasts given below.
The front page shows the edit text along with the submit button where the roll number is entered. From there after submit is entered and the roll number is valid then we enter fragment 1, where we are greeted by the app and we have 5 choices for 5 courses and we need to choose any out of them. After that if we click the submit list button then we are transferred to fragment 2 where we have the list of all the courses displayed to us along with roll number. Whenever ever user does something unexpected like not giving input etc then I flash a message.

Device Specifications:
Both the app run on min SDK version of 16 (so anything above API 16 - Android 4.1 - Jelly Bean would run this app which is 99.8% of devices). Currently, I have run it on Pixel API 30 for outputs. Only default libraries were used for making any app and nothing additional.

Name: Pixel_3
Resolution: 1080 X 2220
API: 30
Target: Android 11.0
hw.lcd.height: 2220
hw.accelerometer: yes
hw.device.manufacturer: Google
hw.lcd.width: 1080
hw.lcd.density: 440
hw.cpu.ncore: 6
hw.sensors.proximity: yes
hw.sensors.orientation: yes
hw.gpu.enabled: yes

Technical Concepts Learnt:

- **Ui perspective:** I learned Working with LinearLayout, ScrollView, TextView, Button, EditText(where inputType is `number` for dealing with taking input - roll number), FrameLayout.

- **Appln Perspective:**
1. I learned how we can trigger an event based on user click.

2. I learned how to work with `FragmentManager, FragmentTransaction` `to add or replace fragments on the screen from mainActivity.java.`

3. Learned the lifecycle flow of Fragments.

4. Learn how to pass data from a fragment to parent activity and passing data from parent to child fragment.

5. Learned to work with id's inorder to make changes to particular view in the layout.
6. Learned how to access the data from fragment xml file in mainActivity.java

Source Code:

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"
        android:gravity="center_horizontal"
        android:orientation="vertical"
        android:textAlignment="center">

        <EditText
            android:id="@+id/rollNumber"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:ems="10"
            android:hint="Enter Roll Number"
            android:inputType="number" />

        <Button
            android:id="@+id/MainButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:onClick="handleMainSubmit"
            android:text="Submit" />
    </LinearLayout>

    <FrameLayout
```

```xml
        android:id="@+id/fragmentContainer"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_margin="5dp" />
</LinearLayout>
```

MainActivity.java

```java
package com.example.fragmentlab;

import androidx.appcompat.app.AppCompatActivity;
import androidx.fragment.app.FragmentManager;
import androidx.fragment.app.FragmentTransaction;

import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    String rollNum;
    Fragment1 sampleFragment1;
    Fragment2 sampleFragment2;
    FragmentManager fragmentManager;

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

    private void addFragment() {
        fragmentManager = getSupportFragmentManager();
        FragmentTransaction fragmentTransaction =
fragmentManager.beginTransaction();
```

```java
        sampleFragment1 = new Fragment1(rollNum);
        fragmentTransaction.replace(R.id.fragmentContainer,
sampleFragment1);
        fragmentTransaction.commit();
        Toast.makeText(MainActivity.this, "Instantiating Fragment - 1",
Toast.LENGTH_LONG).show();
    }

    private void addFragment2(String Data) {
        FragmentTransaction fragmentTransaction =
fragmentManager.beginTransaction();
        sampleFragment2 = new Fragment2(Data);
        fragmentTransaction.replace(R.id.fragmentContainer,
sampleFragment2);
        fragmentTransaction.commit();
        Toast.makeText(MainActivity.this, "Instantiating Fragment - 2",
Toast.LENGTH_LONG).show();
    }

    public void handleMainSubmit(View view) {
        EditText num = (EditText) findViewById(R.id.rollNumber);
        rollNum = (num.getText().toString().trim());

        if (rollNum.length() == 9) {
            addFragment();
        } else {
            Toast.makeText(MainActivity.this, "Enter Valid Roll Number of
Size - 9", Toast.LENGTH_LONG).show();
        }
    }

    public void Fragment1Submit(View view) {
        CheckBox bt1 =
sampleFragment1.getView().findViewById(R.id.checkBox);
        CheckBox bt2 =
sampleFragment1.getView().findViewById(R.id.checkBox2);
        CheckBox bt3 =
sampleFragment1.getView().findViewById(R.id.checkBox3);
        CheckBox bt4 =
sampleFragment1.getView().findViewById(R.id.checkBox4);
```

```java
        CheckBox bt5 =
sampleFragment1.getView().findViewById(R.id.checkBox5);
        String result = "Roll Number - " + rollNum;


        if (!bt1.isChecked() && !bt2.isChecked() && !bt3.isChecked() &&
!bt4.isChecked() && !bt5.isChecked()) {
            Toast.makeText(MainActivity.this, "Select atleast 1 Course",
Toast.LENGTH_LONG).show();
        } else {


            if (bt1.isChecked())
                result += "\n" + "Registered In App Dev Course";


            if (bt2.isChecked())
                result += "\n" + "Registered In Machine Learning Course";


            if (bt3.isChecked())
                result += "\n" + "Registered In Artificial Intelligence
Course";


            if (bt4.isChecked())
                result += "\n" + "Registered In Data Mining Course";


            if (bt5.isChecked())
                result += "\n" + "Registered In Robotics Course";


            addFragment2(result);
        }
    }
}
```

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"
    tools:context=".Fragment1">
```

```xml
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="50dp"
    android:gravity="center_horizontal"
    android:orientation="vertical"
    android:textAlignment="center">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/info"
        android:layout_marginLeft="20dp"
        android:layout_marginRight="20dp"
        android:text="Select Courses" />

    <CheckBox
        android:id="@+id/checkBox"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="App Dev" />

    <CheckBox
        android:id="@+id/checkBox2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Machine Learning" />

    <CheckBox
        android:id="@+id/checkBox3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Artificial Intelligence" />

    <CheckBox
        android:id="@+id/checkBox4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Data Mining" />
```

```xml
    <CheckBox
        android:id="@+id/checkBox5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Robotics" />

    <Button
        android:id="@+id/Fragment1Button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:onClick="Fragment1Submit"
        android:text="Submit" />

    </LinearLayout>

</FrameLayout>
```

Fragment1.java

```java
package com.example.fragmentlab;

import android.content.Context;
import android.os.Bundle;

import androidx.annotation.NonNull;
import androidx.fragment.app.Fragment;
import androidx.fragment.app.FragmentManager;
import androidx.fragment.app.FragmentTransaction;

import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;

/**
 * A simple {@link Fragment} subclass.
 * Use the {@link Fragment1#newInstance} factory method to
 * create an instance of this fragment.
 */
```

```java
public class Fragment1 extends Fragment {

    // TODO: Rename parameter arguments, choose names that match
    // the fragment initialization parameters, e.g. ARG_ITEM_NUMBER
    private static final String ARG_PARAM1 = "param1";
    private static final String ARG_PARAM2 = "param2";

    // TODO: Rename and change types of parameters
    private String mParam1;
    private String mParam2;

    String Data;

    public Fragment1() {
        // Required empty public constructor
    }

    public Fragment1(String data) {
        Data = data;
    }

    public static Fragment1 newInstance(String param1, String param2) {
        Fragment1 fragment = new Fragment1();
        Bundle args = new Bundle();
        args.putString(ARG_PARAM1, param1);
        args.putString(ARG_PARAM2, param2);
        fragment.setArguments(args);
        return fragment;
    }

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        if (getArguments() != null) {
            mParam1 = getArguments().getString(ARG_PARAM1);
            mParam2 = getArguments().getString(ARG_PARAM2);
        }
    }

    @Override
```

```java
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
                             Bundle savedInstanceState) {
        // Inflate the layout for this fragment
        TextView tv1;
        View view = inflater.inflate(R.layout.fragment_1, container,
false);
        tv1 = view.findViewById(R.id.info);
        tv1.setText(Data + " Please select atleast 1 courses from the below
Available Courses");
        return view;
//          return inflater.inflate(R.layout.fragment_1, container, false);
    }


}
```

fragment_2.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"
    tools:context=".Fragment2">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="50dp"
        android:gravity="center_horizontal"
        android:orientation="vertical"
        android:textAlignment="center">

        <TextView
            android:id="@+id/main_output"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Output Runtime"
            android:textSize="18sp"
            android:textStyle="bold" />
```

```xml
    </LinearLayout>

</FrameLayout>
```

Fragment2.java

```java
package com.example.fragmentlab;

import android.os.Bundle;

import androidx.fragment.app.Fragment;

import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;

/**
 * A simple {@link Fragment} subclass.
 * Use the {@link Fragment2#newInstance} factory method to
 * create an instance of this fragment.
 */
public class Fragment2 extends Fragment {

    // TODO: Rename parameter arguments, choose names that match
    // the fragment initialization parameters, e.g. ARG_ITEM_NUMBER
    private static final String ARG_PARAM1 = "param1";
    private static final String ARG_PARAM2 = "param2";

    // TODO: Rename and change types of parameters
    private String mParam1;
    private String mParam2;

    String Data;

    public Fragment2(String data) {
        // Required empty public constructor
        Data = data;
```

```java
    }

    public Fragment2() {
    }

    /**
     * Use this factory method to create a new instance of
     * this fragment using the provided parameters.
     *
     * @param param1 Parameter 1.
     * @param param2 Parameter 2.
     * @return A new instance of fragment Fragment2.
     */
    // TODO: Rename and change types and number of parameters
    public static Fragment2 newInstance(String param1, String param2) {
        Fragment2 fragment = new Fragment2();
        Bundle args = new Bundle();
        args.putString(ARG_PARAM1, param1);
        args.putString(ARG_PARAM2, param2);
        fragment.setArguments(args);
        return fragment;
    }

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        if (getArguments() != null) {
            mParam1 = getArguments().getString(ARG_PARAM1);
            mParam2 = getArguments().getString(ARG_PARAM2);
        }
    }

    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
                             Bundle savedInstanceState) {
        // Inflate the layout for this fragment
        TextView tv1;
        View view = inflater.inflate(R.layout.fragment_2, container,
false);
        tv1 = view.findViewById(R.id.main_output);
```
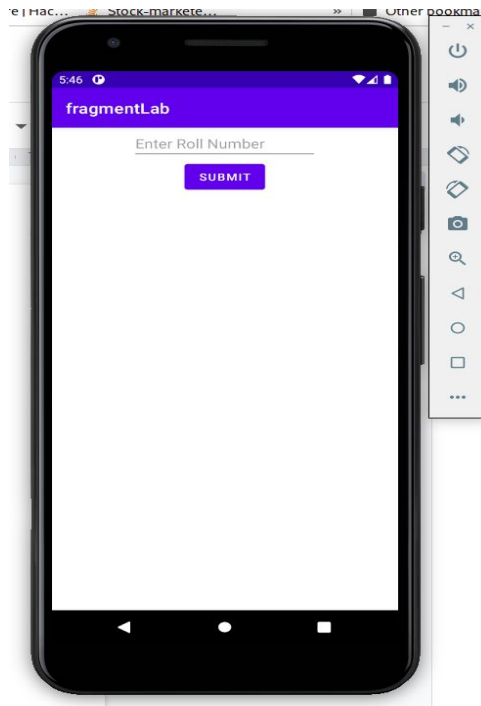
```
        tv1.setText(Data);
        return view;


//          return inflater.inflate(R.layout.fragment_2, container, false);
    }
}
```
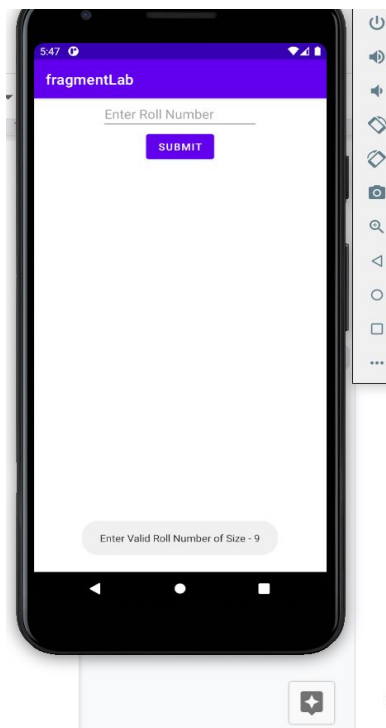
SCROLL DOWN FOR SCREENSHOTS

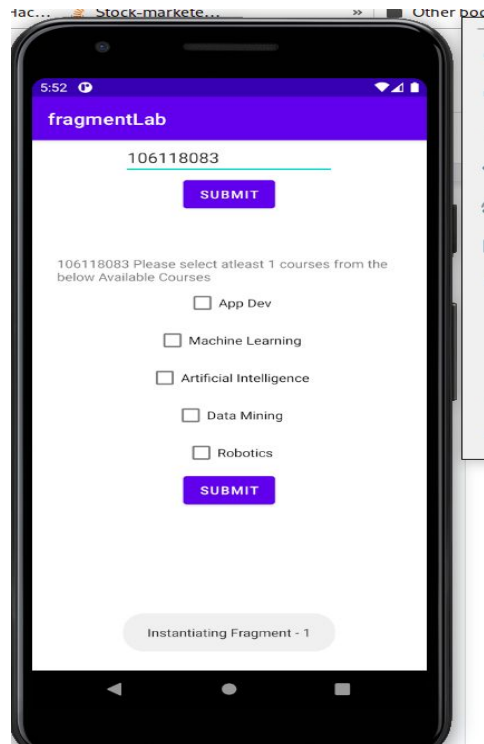**Screenshots:**
Start:

If the roll number is not given or length of roll number is not equal to 9 then I'll show error using toasts.
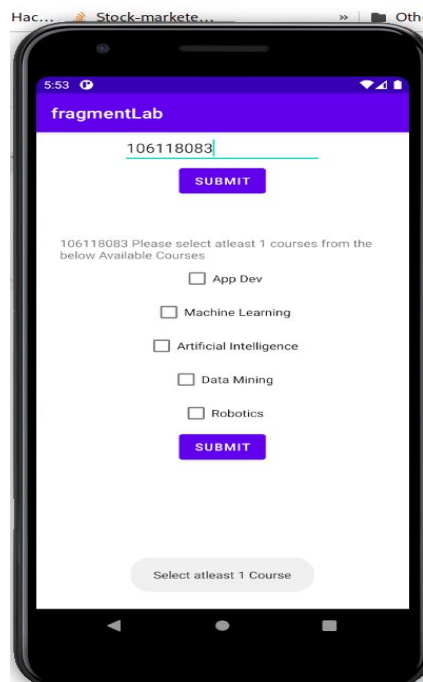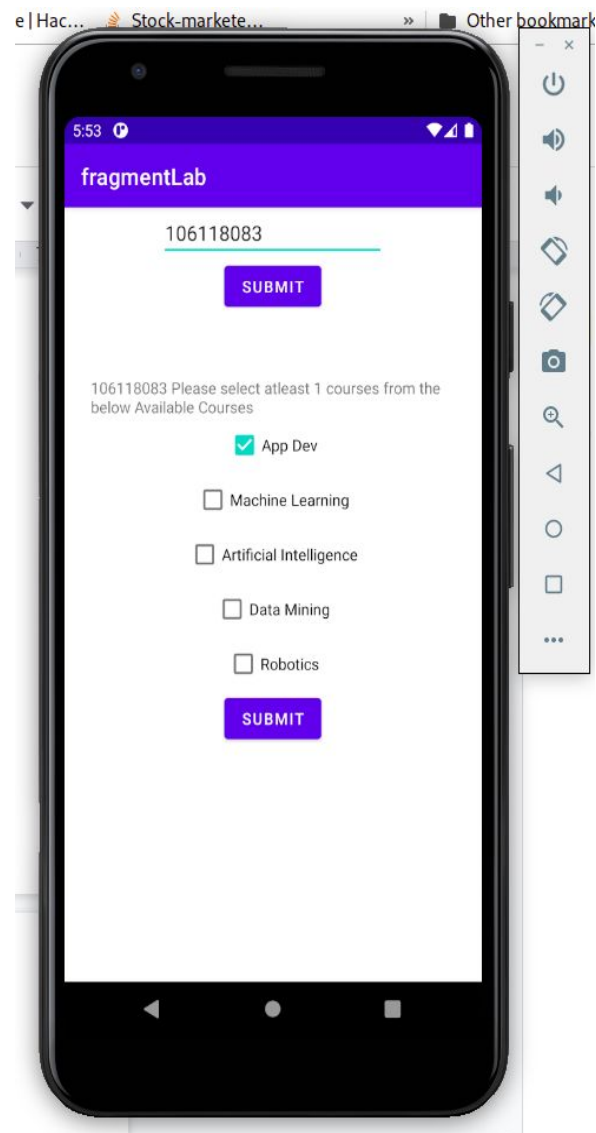

2.

Once valid input is given then I'll show the toast message that we loaded Fragment-1 View.
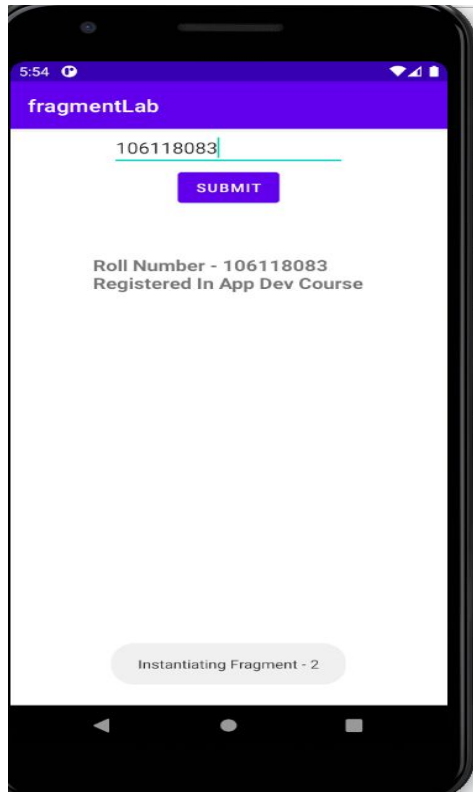

If None of the checkbox is selected and the user clicks on submit then a message is shown to select at least some courses to proceed.
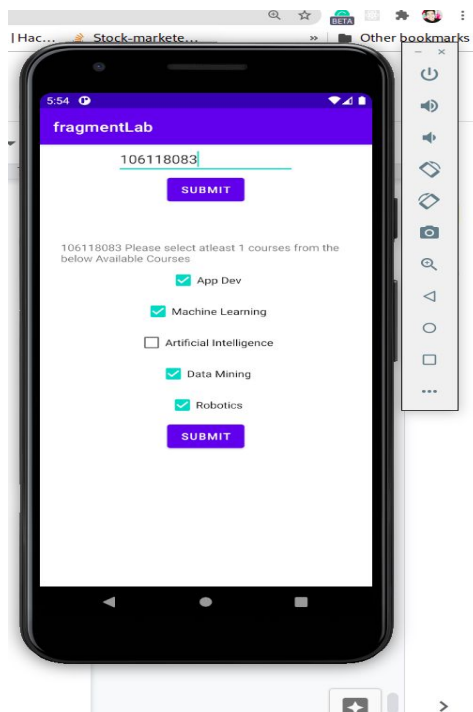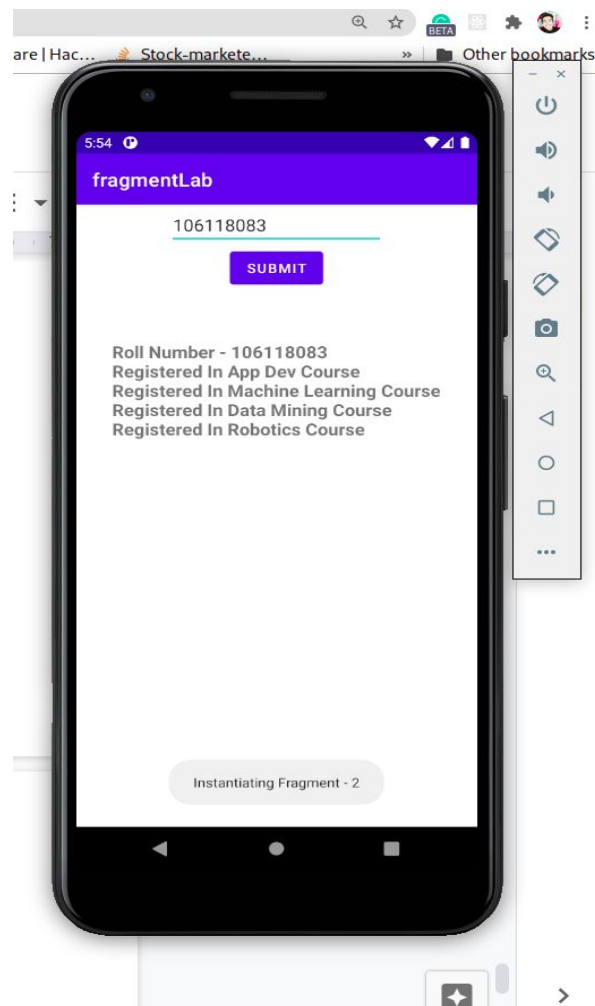
When I select at least 1 course:

Then if I click Submit on Fragment -1 then Im redirected to Fragment - 2 as well as I can see the message In toast:

When I Select Multiple CheckBoxes:

Result:

Outcomes: We accomplished the task to get the courses in another fragment, without any bugs/crashes.