

Mobile Application Development Laboratory
Lab 3

Course Selector

Roll: **106118103**

Name: **V. Aananth**

Aim:

To make an android application using fragments to select courses.

Description of App:

We create a course selection application with the following specifications:

- In an activity, include the Title, Textbox and a Button. Where the user types their roll number in the textbox and upon clicking the button, initiate the first fragment and display the information using toasts.
- First fragment will display the welcome message with the roll number of the student and it should have checkboxes to select a set of courses.
- Upon selecting the courses in the first fragment, initiate the second fragment and display the selected courses with the roll number.

Device Specifications:

Model: Poco F1

Android Version: 9 (API Level 28)

Resolution: 2160 x 1080 pixels

Technical Concepts Learnt:

- To create and manage Fragments using SupportFragmentManager.
- To add, remove and replace Fragments programmatically.
- To create and manage RecyclerViews.
- To create and manage CheckBoxes.
- To create and display toasts.

Source Code:

(i) MainActivity.java

```
package com.example.coursefragment;
```

```
import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {

    CourseListFragment mCourseListFragment;
    Button submitRoll;
    EditText rollNum;
    LinearLayout ll;

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

        rollNum = (EditText) findViewById(R.id.rollInput);
        submitRoll = (Button) findViewById(R.id.submitRoll);
        ll = (LinearLayout) findViewById(R.id.init);

        submitRoll.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Toast.makeText(getApplicationContext(),
rollNum.getText().toString(), Toast.LENGTH_SHORT).show();

                mCourseListFragment =
CourseListFragment.newInstance(1, rollNum.getText().toString());
                getSupportFragmentManager().beginTransaction().add(
                    R.id.fragment,
                    mCourseListFragment,
                    "CourseDisplayFragment"
                ).commit();
            }
        });
    }
}
```

```

    }
    });
}
}

```

(ii) Course.java

```

package com.example.coursefragment;

public class Course {
    public final String code;
    public final String name;

    public Course(String code, String name) {
        this.code = code;
        this.name = name;
    }

    @Override
    public String toString() {
        return code + ": " + name;
    }
}

```

(iii) CourseDisplayFragment.java

```

package com.example.coursefragment;

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

import androidx.fragment.app.Fragment;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;

import android.util.Log;
import android.view.LayoutInflater;
import android.view.View;

```

```

import android.view.ViewGroup;
import android.widget.Button;
import android.widget.TextView;

import java.util.ArrayList;

/**
 * A fragment representing a list of Items.
 */
public class CourseDisplayFragment extends Fragment {

    // TODO: Customize parameter argument names
    private static final String ARG_ROLL_NUMBER = "roll-number";

    // TODO: Customize parameters
    private String mRollNumber;
    public ArrayList<Course> mSelectedCourses;

    // Recycler View
    RecyclerView mRecyclerView;
    CourseRecyclerViewAdapter mCourseRecyclerViewAdapter;

    // Roll number
    TextView mRollNumberView;

    // Back button
    Button mBackButton;

    /**
     * Mandatory empty constructor for the fragment manager to
    instantiate the
     * fragment (e.g. upon screen orientation changes).
     */
    public CourseDisplayFragment() {
    }

    // TODO: Customize parameter initialization
    @SuppressWarnings("unused")
    public static CourseDisplayFragment newInstance(String

```

```

rollNumber, ArrayList<Course> selectedCourses) {
    CourseDisplayFragment fragment = new CourseDisplayFragment();
    Bundle args = new Bundle();
    args.putString(ARG_ROLL_NUMBER, rollNumber);
    fragment.mSelectedCourses = selectedCourses;
    fragment.setArguments(args);
    return fragment;
}

@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    mCourseRecyclerViewAdapter = new
CourseRecyclerViewAdapter(mSelectedCourses);

    if (getArguments() != null) {
        mRollNumber = getArguments().getString(ARG_ROLL_NUMBER);
    }
}

@Override
public View onCreateView(LayoutInflater inflater, ViewGroup
container,

                                Bundle savedInstanceState) {
    View view =
inflater.inflate(R.layout.fragment_course_display_list, container,
false);

    View recyclerView = view.findViewById(R.id.list);
    mBackButton = view.findViewById(R.id.back_button);
    mRollNumberView = view.findViewById(R.id.roll_number);

    mBackButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            closeFragment();
        }
    });
}

```

```

        mRollNumberView.setText(mRollNumber);

        // Set the adapter
        if (recyclerView instanceof RecyclerView) {
            Context context = recyclerView.getContext();
            mRecyclerView = (RecyclerView) recyclerView;
            mRecyclerView.setLayoutManager(new
LinearLayoutManager(context));
            mRecyclerView.setAdapter(mCourseRecyclerViewAdapter);
        }
        return view;
    }

    private void closeFragment() {
        getActivity().getSupportFragmentManager().beginTransaction().remove(t
his).commit();
    }
}

```

(iv) CourseRecyclerViewAdapter.java

```

package com.example.coursefragment;

import androidx.recyclerview.widget.RecyclerView;

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

import java.util.ArrayList;
import java.util.List;

/**
 * {@link RecyclerView.Adapter} that can display a {@link DummyItem}.
 * TODO: Replace the implementation with code for your data type.

```

```

*/
public class CourseRecyclerViewAdapter extends
RecyclerView.Adapter<CourseRecyclerViewAdapter.ViewHolder> {

    private final List<Course> mValues;

    public CourseRecyclerViewAdapter(ArrayList<Course> items) {
        mValues = items;
    }

    @Override
    public ViewHolder onCreateViewHolder(ViewGroup parent, int
viewType) {
        View view = LayoutInflater.from(parent.getContext())
            .inflate(R.layout.fragment_course_display, parent,
false);
        return new ViewHolder(view);
    }

    @Override
    public void onBindViewHolder(final ViewHolder holder, int
position) {
        holder.mItem = mValues.get(position);
        holder.mCodeView.setText(mValues.get(position).code);
        holder.mNameView.setText(mValues.get(position).name);
    }

    @Override
    public int getItemCount() {
        return mValues.size();
    }

    public class ViewHolder extends RecyclerView.ViewHolder {
        public final View mView;
        public final TextView mCodeView;
        public final TextView mNameView;
        public Course mItem;

        public ViewHolder(View view) {

```

```

        super(view);
        mView = view;
        mCodeView = (TextView)
view.findViewById(R.id.course_code);
        mNameView = (TextView)
view.findViewById(R.id.course_name);
    }

    @Override
    public String toString() {
        return super.toString() + " '" + mNameView.getText() +
        "'";
    }
}

```

(v) CourseListFragment.java

```

package com.example.coursefragment;

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

import androidx.fragment.app.Fragment;
import androidx.recyclerview.widget.GridLayoutManager;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;

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

import java.util.ArrayList;

public class CourseListFragment extends Fragment {

```



```

RecyclerView mRecyclerView;
CourseListRecyclerViewAdapter mRecyclerViewAdapter;
CourseDisplayFragment mCourseDisplayFragment;
private static final String ARG_COLUMN_COUNT = "column-count";
private static final String ROLL_NUMBER = "roll";

private ArrayList<Course> courseList = new ArrayList<Course>();
private int mColumnCount = 1;
private String mRollNumber;
private TextView rollNumber;
private Button submit;

public CourseListFragment() {
}

@SuppressWarnings("unused")
public static CourseListFragment newInstance(int columnCount,
String rollNumber) {
    CourseListFragment fragment = new CourseListFragment();
    Bundle args = new Bundle();
    args.putInt(ARG_COLUMN_COUNT, columnCount);
    args.putString(ROLL_NUMBER, rollNumber);
    fragment.setArguments(args);
    return fragment;
}

@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    courseList.add(new Course("CSPC12", "Crypto"));
    courseList.add(new Course("CSPS13", "Probability"));
    courseList.add(new Course("CSPC14", "MAD"));
    courseList.add(new Course("CSPC21", "MAD Lab"));
    courseList.add(new Course("CSPC22", "Data Structures"));
    courseList.add(new Course("CSPC32", "DS Lab"));
    courseList.add(new Course("CSPC33", "Algorithms"));
    courseList.add(new Course("CSPC34", "Automata"));
}

```

```

        courseList.add(new Course("CSPC35", "OS"));
        courseList.add(new Course("CSPC36", "CO"));
        courseList.add(new Course("CSPC41", "CA"));
        courseList.add(new Course("CSPC42", "DBMS"));
        courseList.add(new Course("CSPC43", "ML"));
        courseList.add(new Course("CSPC44", "Compilers"));
        courseList.add(new Course("CSPC45", "MPMC"));

        mRecyclerViewAdapter = new
CourseListRecyclerViewAdapter(courseList);

        if (getArguments() != null) {
            mColumnCount = getArguments().getInt(ARG_COLUMN_COUNT);
            mRollNumber = getArguments().getString(ROLL_NUMBER);
        }
    }

    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup
container,

                                Bundle savedInstanceState) {

        View view =
inflater.inflate(R.layout.fragment_course_list_list, container,
false);

        View recyclerView = view.findViewById(R.id.list);

        if (recyclerView instanceof RecyclerView) {
            Context context = recyclerView.getContext();
            mRecyclerView = (RecyclerView) recyclerView;
            mRecyclerView.setLayoutManager(new
LinearLayoutManager(context));
            mRecyclerView.setAdapter(mRecyclerViewAdapter);
        }

        rollNumber = (TextView) view.findViewById(R.id.roll);
        submit = (Button) view.findViewById(R.id.submit);
        rollNumber.setText(mRollNumber);

```

```

        submit.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                mCourseDisplayFragment =
                CourseDisplayFragment.newInstance(rollNumber.getText().toString(),
                mRecyclerViewAdapter.mSelectedCourses);

                getActivity().getSupportFragmentManager().beginTransaction().replace(
                R.id.fragment, mCourseDisplayFragment).commit();
            }
        });
        return view;
    }
}

```

(vi) CourseListRecyclerViewAdapter.java

```

package com.example.coursefragment;

import androidx.recyclerview.widget.RecyclerView;

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

import java.util.ArrayList;
import java.util.List;

public class CourseListRecyclerViewAdapter extends
RecyclerView.Adapter<CourseListRecyclerViewAdapter.ViewHolder> {

    private final List<Course> mValues;
    public ArrayList<Course> mSelectedCourses = new
    ArrayList<Course>();
}

```

```

    public CourseListRecyclerViewAdapter(List<Course> items) {
        mValues = items;
    }

    @Override
    public ViewHolder onCreateViewHolder(ViewGroup parent, int
viewType) {
        View view = LayoutInflater.from(parent.getContext())
            .inflate(R.layout.fragment_course_list, parent,
false);
        return new ViewHolder(view);
    }

    @Override
    public void onBindViewHolder(final ViewHolder holder, int
position) {
        holder.mCourse = mValues.get(position);
        holder.mCourseCode.setText(mValues.get(position).code);
        holder.mCourseName.setText(mValues.get(position).name);
    }

    @Override
    public int getItemCount() {
        return mValues.size();
    }

    public class ViewHolder extends RecyclerView.ViewHolder {
        public final View mView;
        public final TextView mCourseCode;
        public final TextView mCourseName;
        public boolean isChecked = false;
        public Course mCourse;

        public ViewHolder(View view) {
            super(view);
            mView = view;
            mCourseCode = (TextView) view.findViewById(R.id.code);
            mCourseName = (TextView) view.findViewById(R.id.name);

```

```

        mCourse = new Course(mCourseCode.getText().toString(),
mCourseName.getText().toString());

        mView.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                isChecked = !isChecked;

                if (isChecked) {
                    mSelectedCourses.add(mCourse);
                    mCourseName.setBackgroundColor(0xff669900);
                } else {
                    mSelectedCourses.remove(mCourse);
                    mCourseName.setBackgroundColor(0xffcc0000);
                }
            }
        });
    }

    @Override
    public String toString() {
        return super.toString() + " '" + mCourseName.getText() +
        "'";
    }
}

```

Video Demo:

<https://drive.google.com/file/d/185eQCWewazAbDKa1B1FFgLk1uQMlv2e4/view?usp=sharing>

APK:

https://drive.google.com/file/d/1huox3BtO7gvZor4v-1WvFPO_q1-CeOuS/view?usp=sharing

Screenshots:

Course Selector

Enter Roll Number

SUBMIT

(i) Initial State

Course Selector

106118103

SUBMIT

(ii) Enter Roll Number

Roll No: 106118103
Select Courses

CSPC12	Crypto
CSPS13	Probability
CSPC14	MAD
CSPC21	MAD Lab
CSPC22	Data Structures
CSPC32	DS Lab
CSPC33	Algorithms
CSPC34	Automata

SUBMIT

(iii) Select Courses

Roll No: 106118103
Selected Courses

CSPC14	MAD
CSPC21	MAD Lab
CSPC22	Data Structures
CSPC32	DS Lab
CSPC33	Algorithms

BACK

(iv) Selected Courses

Outcomes:

An android application was developed for course selection. Various concepts in Android App Development were explored including:

- Creating and managing Fragments using SupportFragmentManager.
- Adding, removing and replacing Fragments programmatically.
- Creating and managing RecyclerViews.
- Creating and managing CheckBoxes.
- Creating and displaying toasts.