

LAB 1

IMPORTANT. You must save all your work in a way that you are able to present them to teacher during the evaluation discussion. You could use for instance GIT.
You also need to have working developer environment where you can run the assignments.

1. Study following object oriented concepts

You have studied object oriented programming concepts on earlier courses. I want that you recap following issues in **Java programming language**. Understanding these are really important to successfully complete the course

1. Object
2. Class
3. Instantiation of object (creating an object)
4. Visibility (public / private / protected)
5. Member datas / methods
6. Inheritance
7. Interface
8. Polymorphism
9. Overriding
10. Abstract classes

Create a document and **write a description** (with your own words) of each of the topics above. Please also create example project and **demonstrate each concept in Java** programming language. Please add the demonstration code to your document.

2. More UI

Create an Android app where you practice more how to use UI designer in Android Studio. Test different layouts and UI components and run your app in your device or emulator. Test at least: **LinearLayout (vertical, horizontal), ConstraintLayout and CoordinatorLayout.**

3. Study Android fundamental concepts

<https://developer.android.com/guide/components/fundamentals>

Answer to following questions:

1. What programming languages you can use for Android app development?
2. What is .apk file?
3. How Android system runs apps?
4. Name four types of Android components. Describe each.
5. What is manifest file and what is its purpose?

6. What are resources? Why they are needed?

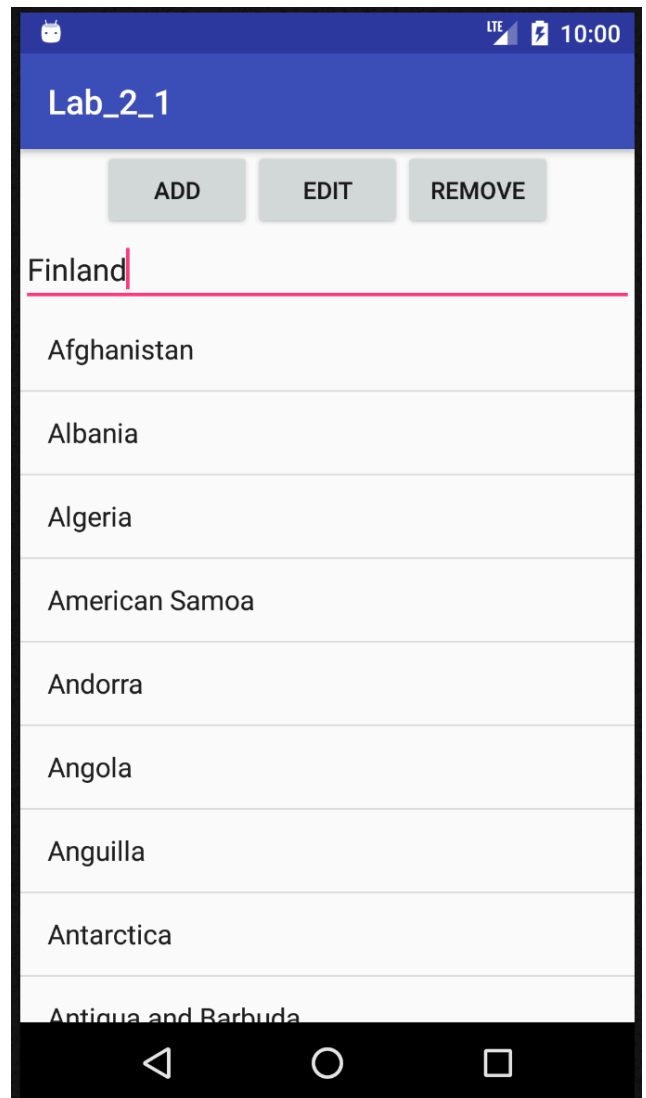
Write down your answers to document and save it.

1. UI Hierarchies (Layouts)

Create a new project in Android Studio.

Open the main layout file in the UI Editor

Create following UI in the editor (Please note, you can not add list elements (countries in this case) to the list in the editor, we “code” them later on).



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

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:orientation="vertical" >
    <LinearLayout
        android:id="@+id/linearLayout1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center" >

        <Button
            android:id="@+id/add_button"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Add" />

        <Button
            android:id="@+id/edit_button"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Edit" />

        <Button
            android:id="@+id/remove_button"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="fill_vertical"
            android:text="Remove" />
    </LinearLayout>

    <EditText
        android:id="@+id/text_editor"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <ListView android:id="@+id/country_list_view"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content" />
</LinearLayout>
```

Before adding any code, please test you app now, if it seems ok, please continue.

As a last step let's add countries to ListView. Open your main activity's Java file (under src folder). Modify onCreate method to add items to ListView. See help from code below:

```
public class MainActivity extends AppCompatActivity {  
  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
  
        final String[] COUNTRIES = new String[] {  
            "Afghanistan", "Albania", "Algeria", "American Samoa", "Andorra",  
            "Angola", "Anguilla", "Antarctica", "Antigua and Barbuda", "Argentina",  
            "Armenia", "Aruba", "Australia", "Austria", "Azerbaijan"  
        };  
        ListView myListView = (ListView) findViewById(R.id.country_list_view);  
        final ArrayAdapter<String> aa;  
        aa = new ArrayAdapter<String>(context: this, android.R.layout.simple_list_item_1,  
            COUNTRIES);  
        myListView.setAdapter(aa);  
    }  
}
```

Test your app now. Can you see the countries list on the screen? We have not any functionality to buttons yet, they don't do anything currently.

Analyze the code you wrote. What it does and why?