Lab 3

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CSE 461 – Dr. Tong Yu

Part I: Basics – Create Hello World App

We followed the instructions that were provided to us in the Android guide posted on Dr. Yu's website. It provided a step by step instruction on how to use the IDE and the development of the first app. It provided an insight on how to run an instance of the application and provides more than one "emulator" to run the application on. Bellow is the snippets of code used to develop the Hello World App.

MainActivity.java

```
package com.example.helloworld;

import android.os.Bundle;
import android.support.design.widget.FloatingActionButton;
import android.support.design.widget.Snackbar;
import android.support.v7.app.AppCompatActivity;
import android.support.v7.widget.Toolbar;
import android.view.View;
import android.view.Menu;
import android.view.MenuItem;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Toolbar toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);

        FloatingActionButton fab = findViewById(R.id.fab);
        fab.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Snackbar.make(view, "Replace with your own action",
Snackbar.LENGTH_LONG)
                        .setAction("Action", null).show();
            }
        });
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action bar if it is present.
        getMenuInflater().inflate(R.menu.menu_main, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        // Handle action bar item clicks here. The action bar will
        // automatically handle clicks on the Home/Up button, so long
        // as you specify a parent activity in AndroidManifest.xml.
        int id = item.getItemId();
```

```
        //noinspection SimplifiableIfStatement
        if (id == R.id.action_settings) {
            return true;
        }

        return super.onOptionsItemSelected(item);
    }
}
```

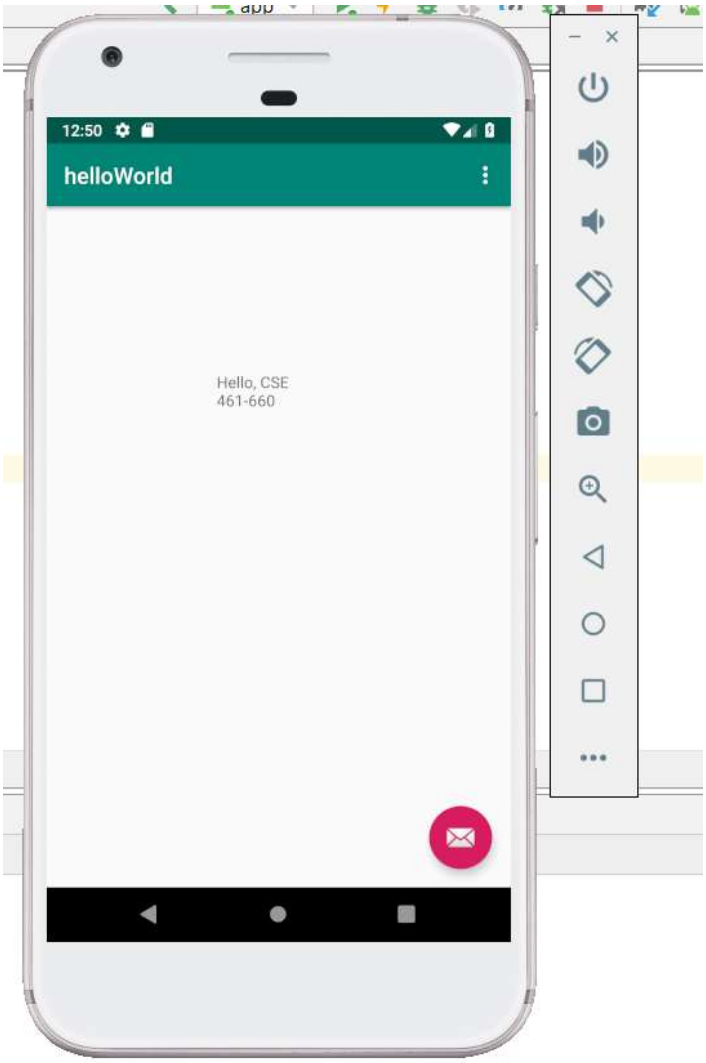
Content_Main.xml

```
<?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"
    app:layout_behavior="@string/appbar_scrolling_view_behavior"
    tools:context=".MainActivity"
    tools:showIn="@layout/activity_main">

    <TextView
        android:layout_width="109dp"
        android:layout_height="102dp"
        android:text="Hello, CSE 461-660"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.291"
        tools:layout_editor_absoluteX="121dp"/>

</android.support.constraint.ConstraintLayout>
```

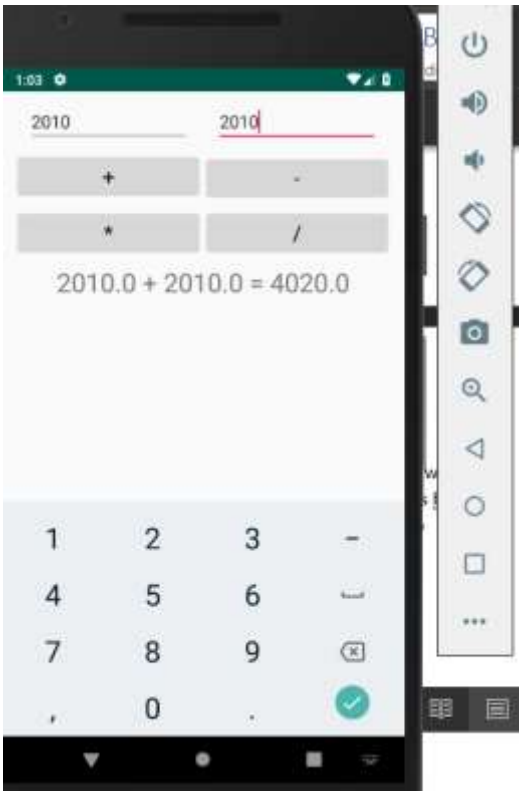
Output:



Part II: Simple Calculator – w/Android

The code in this section was provided by the professor's lab manual. It provided an insight about how a calculator can be created using simple java. Although the input of the code is very complex, changes must be made to suit the needs of the virtual phone. The following is the OUTPUT we received prior to completing the assignment:

PRIOR OUTPUT:


1:03
2010
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After modifying the code:

The following files have been named: Calculator, Calculator and example.calculator and *modified*

MainActivity.java

```
package example.calculator;

import android.os.Bundle;
import android.app.Activity;
import android.content.DialogInterface;
import android.content.DialogInterface.OnClickListener;
import android.text.TextUtils;
import android.view.Menu;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ImageButton;
import android.widget.TextView;

public class MainActivity extends Activity implements View.OnClickListener{
    EditText t1;
```

```
    EditText t2;

    ImageButton plus;
    ImageButton minus;
    ImageButton multiply;
    ImageButton divide;

    TextView displayResult;

    String oper = "";

    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        // find the EditText elements (defined in
res/layout/activity_main.xml
        t1 = (EditText) findViewById(R.id.t1);
        t2 = (EditText) findViewById(R.id.t2);

        plus = (ImageButton) findViewById(R.id.plus);
        minus = (ImageButton) findViewById(R.id.minus);
        multiply = (ImageButton) findViewById(R.id.multiply);
        divide = (ImageButton) findViewById(R.id.divide);

        displayResult = (TextView) findViewById(R.id.displayResult);

        // set  listeners
        plus.setOnClickListener( this );
        minus.setOnClickListener( this);
        multiply.setOnClickListener( this);
        divide.setOnClickListener( this);

    }

    // @Override
    public void onClick( View view ) {
        double num1 = 0;
        double num2 = 0;
        double result = 0;

        // check if the fields are empty
        if (TextUtils.isEmpty(t1.getText().toString())
                || TextUtils.isEmpty(t2.getText().toString())) {
            return;
        }

        // read EditText and fill variables with numbers
        num1 = Float.parseFloat(t1.getText().toString());
        num2 = Float.parseFloat(t2.getText().toString());

        // perform operations
        // save operator in oper for later use
        switch ( view.getId() ) {
            case R.id.plus:
```

```
                oper = "+";
                result = num1 + num2;
                break;
            case R.id.minus:
                oper = "-";
                result = num1 - num2;
                break;
            case R.id.multiply:
                oper = "*";
                result = num1 * num2;
                break;
            case R.id.divide:
                oper = "/";
                result = num1 / num2;
                break;
            default:
                break;
        }

        // form the output line
        displayResult.setText(num1 + " " + oper + " " + num2 + " = " +
result);
    }
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/linearLayout1"
        android:layout_marginLeft="12pt"
        android:layout_marginRight="12pt"
        android:layout_marginTop="4pt">
        <EditText
            android:layout_weight="1"
            android:layout_height="wrap_content"
            android:layout_marginRight="6pt"
            android:id="@+id/t1"
            android:layout_width="match_parent"
            android:inputType="numberDecimal">
        </EditText>
        <EditText
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:layout_marginLeft="6pt"
            android:id="@+id/t2"
            android:layout_width="match_parent"
            android:inputType="numberDecimal">
```

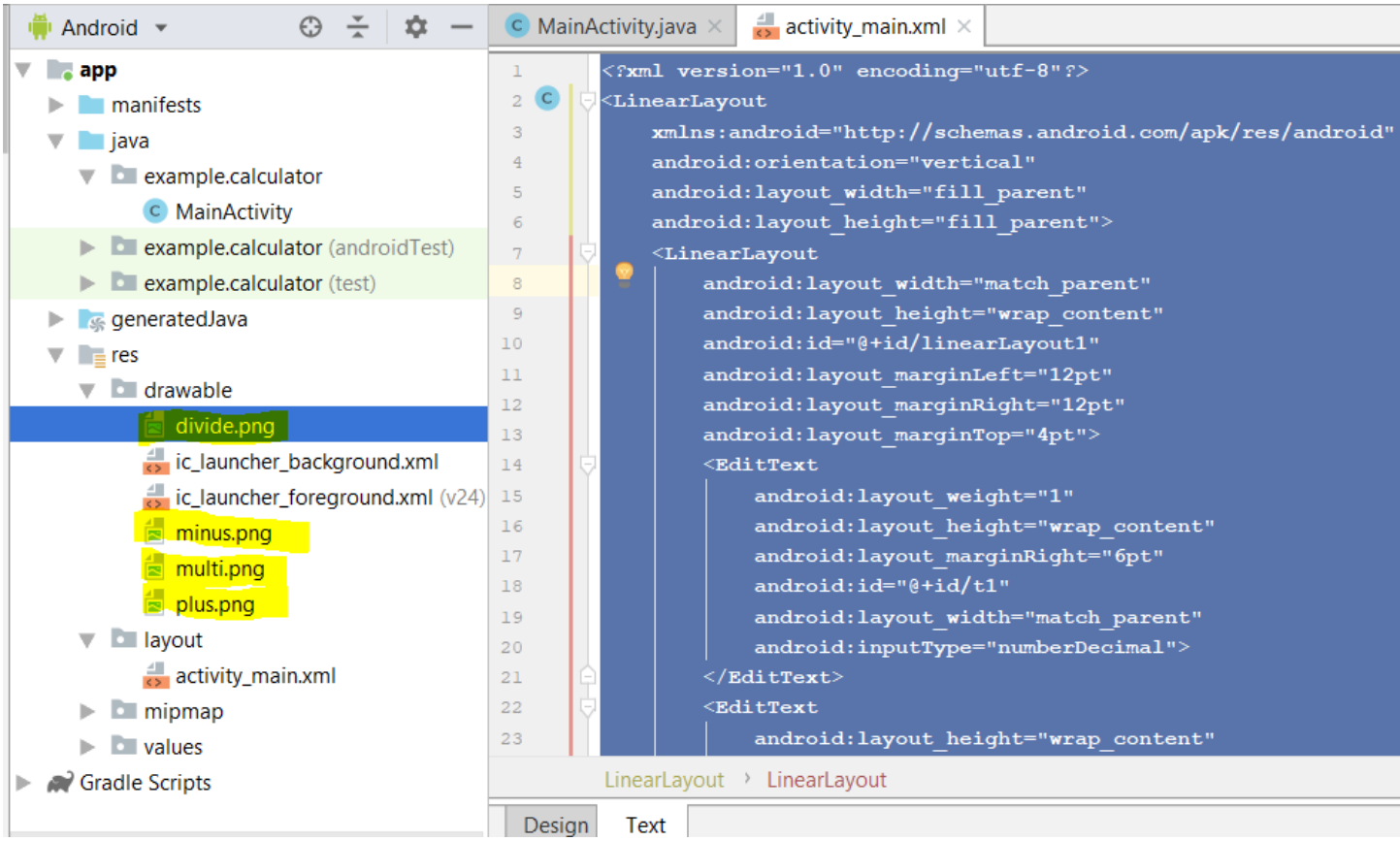
```
    </EditText>
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/linearLayout2"
    android:layout_marginTop="4pt"
    android:layout_marginLeft="6pt"
    android:layout_marginRight="6pt">
    <ImageButton
        android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:src="@drawable/plus"
        android:layout_weight="1"
        android:textSize="10pt"
        android:id="@+id/plus">
    </ImageButton>
    <ImageButton
        android:layout_height="wrap_content"
        android:src="@drawable/minus"
        android:layout_width="match_parent"
        android:layout_weight="1"
        android:textSize="8pt"
        android:id="@+id/minus">
    </ImageButton>
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/linearLayout3"
    android:layout_marginTop="4pt"
    android:layout_marginLeft="6pt"
    android:layout_marginRight="6pt">

    <ImageButton
        android:layout_height="wrap_content"
        android:src="@drawable/multi"
        android:layout_width="match_parent"
        android:layout_weight="1"
        android:textSize="10pt"
        android:id="@+id/multiply">
    </ImageButton>
    <ImageButton
        android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:layout_weight="1"
        android:src="@drawable/divide"
        android:textSize="10pt"
        android:id="@+id/divide">
    </ImageButton>
</LinearLayout>

<TextView
    android:layout_height="wrap_content"
    android:layout_width="match_parent"
    android:layout_marginLeft="6pt"
    android:layout_marginRight="6pt"
```

```
        android:textSize="12pt"
        android:layout_marginTop="4pt"
        android:id="@+id/displayResult"
        android:gravity="center_horizontal">
    </TextView>
</LinearLayout>
```

Please notice that we have added the images to the root folder of "drawable" so that the images populate when the application runs.



Part III: Android Fragments

For this portion we had to research online how to create android fragments and implement them with MainActivity.java – The hardest part about this lab was being able to understand how the buttons and the onClickActivity worked within the virtual device. We didn't understand that within MainActivity is where it ties the click event buttons and creates the fragment view. We used the toast widget, which will notify the person that the button has been clicked.

MainActivity.java

```
package example.fragments;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.support.v4.app.Fragment;
import android.support.v4.app.FragmentManager;
import android.support.v4.app.FragmentTransaction;
import android.widget.Button;
import android.view.View;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener{
    Button fragA;
    Button fragB;
    @Override
    protected void onCreate(Bundle savedInstanceState){
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        fragA = (Button) findViewById(R.id.fragA);
        fragB = (Button) findViewById(R.id.fragB);

        fragA.setOnClickListener(this);
        fragB.setOnClickListener(this);

        if (findViewById(R.id.main_frame) !=null){
            if(savedInstanceState != null)
                return;

            FragmentManager fm = getSupportFragmentManager();
            FragmentTransaction ft = fm.beginTransaction();
            ft.replace(R.id.main_frame, new FragmentA());
            ft.commit();
        }
    }
    public void onClick(View view){
        Fragment fragment;
        if(view == findViewById(R.id.fragA)){
            fragment = new FragmentA();
            FragmentManager fm = getSupportFragmentManager();
            Toast.makeText(this, "Fragment A Selected",
Toast.LENGTH_SHORT).show();
            FragmentTransaction ft = fm.beginTransaction();
            ft.replace(R.id.main_frame, fragment);
            ft.commit();
        }
        if(view == findViewById(R.id.fragB)){
            fragment = new FragmentB();
            FragmentManager fm = getSupportFragmentManager();
            Toast.makeText(this, "Fragment B Selected",
Toast.LENGTH_SHORT).show();
            FragmentTransaction ft = fm.beginTransaction();
            ft.replace(R.id.main_frame, fragment);
            ft.commit();
```

```
        }
    }
}
```

Activity_Main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <Button
        android:id="@+id/fragA"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Fragment A" />
    <Button
        android:id="@+id/fragB"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Fragment B" />
    <FrameLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_weight="1"
        android:id="@+id/main_frame">
        <!-- Fragment added here onCreate -->
    </FrameLayout>
</LinearLayout>
```

FragmentA.java

```
package example.fragments;

import android.os.Bundle;
import android.support.annotation.Nullable;
import android.support.v4.app.Fragment;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;

public class FragmentA extends Fragment{
    @Nullable
    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState){
        return inflater.inflate(R.layout.fragment_a, container, false);
    }
}
```

fragment_a.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="example.fragments.FragmentA"
    android:background="#FFFDF48D">
    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="I am Fragment A"
        tools:text="I am Fragment A"
        android:textStyle="bold"
        android:textSize="35dp"/>
</LinearLayout>
```

FragmentB.java

```
package example.fragments;

import android.os.Bundle;
import android.support.annotation.Nullable;
import android.support.v4.app.Fragment;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;

public class FragmentB extends Fragment{
    @Nullable
    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState){
        return inflater.inflate(R.layout.fragment_b, container, false);
    }
}
```

fragment_b.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="example.fragments.FragmentB"
    android:background="#FF81E8F5">
    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="I am Fragment B"
        tools:text="I am Fragment B"
        android:textStyle="bold"
        android:textSize="35dp"
        />
</LinearLayout>
```