<Java Source Codes>

```java
package org.cnit355jieun.converterapp_jy;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.content.res.ResourcesCompat;

import android.content.Intent;
import android.graphics.drawable.Drawable;
import android.os.Bundle;
import android.text.Editable;
import android.text.TextWatcher;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.Spinner;
import android.widget.TextView;
import android.widget.Toast;

import java.sql.Time;
import java.text.DateFormat;
import java.text.DecimalFormat;
import java.text.SimpleDateFormat;
import java.util.Date;


public class MainActivity extends AppCompatActivity {


    Spinner spinner;

    String[] Countries_Currency = {"USD","CAD","CNY","INR","KRW",
            "NTD","MYR","COP","IDR"};

    String[] Countries_Time = {"US","Canada","China","India","Korea",
            "Taiwan","Malaysia","Colombia","Indonesia"};



    Double num = 0.0;

    Double cadVal = 1.3;
    Double korVal = 1181.0;
```

```java
Double usVal = 1.0;
Double indiaVal = 71.0;
Double colVal = 3453.29;
Double taiVal = 30.59;
Double indoVal = 14144.0;
Double chinaVal=7.08 ;
Double malayVal =4.19 ;


ImageView mUSView;
ImageView mCanadaView;
ImageView mIndiaView;
ImageView mKoreaView;
ImageView mChinaView;
ImageView mTaiwanView;
ImageView mMalaysiaView;
ImageView mColumbiaView;
ImageView mIndonesiaView;


TextView mCategoryTextView;
EditText mEditText;

TextView mUSText3;
TextView mUSText4;

TextView mCanadaText3;
TextView mCanadaText4;

TextView mChinatext3;
TextView mChinatext4;

TextView mIndiatext3;
TextView mIndiatext4;

TextView mKoreatext3;
TextView mKoreatext4;

TextView mTaiwantext3;
TextView mTaiwantext4;

TextView mMalaysiatext3;
TextView mMalaysiatext4;

TextView mColumbiatext3;
TextView mColumbiatext4;
```

```java
TextView mIndonesiatext3;
TextView mIndonesiatext4;

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


    spinner = (Spinner)findViewById(R.id.spinner);

     mUSView= findViewById(R.id.UnitedStatesView);
     mCanadaView= findViewById(R.id.CanadaView);
     mIndiaView = findViewById(R.id.IndiaView);
     mKoreaView=findViewById(R.id.KoreaView);
     mChinaView=findViewById(R.id.ChinaView);
     mTaiwanView=findViewById(R.id.TaiwanView);
     mMalaysiaView=findViewById(R.id.MalaysiaView);
     mColumbiaView=findViewById(R.id.ColumbiaView);
     mIndonesiaView=findViewById(R.id.IndonesiaView);


    mCategoryTextView = findViewById(R.id.CategoryTextView);


    mUSText3= findViewById(R.id.USText3);
    mUSText4= findViewById(R.id.USText4);

    mCanadaText3= findViewById(R.id.CanadaText3);
    mCanadaText4= findViewById(R.id.CanadaText4);

    mChinatext3= findViewById(R.id.ChinaText3);
    mChinatext4= findViewById(R.id.ChinaText4);

    mIndiatext3= findViewById(R.id.IndiaText3);
    mIndiatext4= findViewById(R.id.IndiaText4);

    mKoreatext3= findViewById(R.id.KoreaText3);
    mKoreatext4= findViewById(R.id.KoreaText4);

    mTaiwantext3= findViewById(R.id.TaiwanText3);
    mTaiwantext4= findViewById(R.id.TaiwanText4);

    mMalaysiatext3= findViewById(R.id.MalaysiaText3);
    mMalaysiatext4= findViewById(R.id.MalaysiaText4);
```

```java
        mColumbiatext3= findViewById(R.id.ColumbiaText3);
        mColumbiatext4= findViewById(R.id.ColumbiaText4);

        mIndonesiatext3= findViewById(R.id.IndonesiaText3);
        mIndonesiatext4= findViewById(R.id.IndonesiaText4);


        Drawable drawable_US =
ResourcesCompat.getDrawable(getResources(),R.drawable.unitedstates,null);
        mUSView.setImageDrawable(drawable_US);

        Drawable drawable_Canada =
ResourcesCompat.getDrawable(getResources(),R.drawable.canada,null);
        mCanadaView.setImageDrawable(drawable_Canada);

        Drawable drawable_China =
ResourcesCompat.getDrawable(getResources(),R.drawable.china,null);
        mChinaView.setImageDrawable(drawable_China);

        Drawable drawable_India =
ResourcesCompat.getDrawable(getResources(),R.drawable.india,null);
        mIndiaView.setImageDrawable(drawable_India);

        Drawable drawable_Korea =
ResourcesCompat.getDrawable(getResources(),R.drawable.southkorea,null);
        mKoreaView.setImageDrawable(drawable_Korea);

        Drawable drawable_Taiwan =
ResourcesCompat.getDrawable(getResources(),R.drawable.taiwan,null);
        mTaiwanView.setImageDrawable(drawable_Taiwan);

        Drawable drawable_Malaysia =
ResourcesCompat.getDrawable(getResources(),R.drawable.malaysia,null);
        mMalaysiaView.setImageDrawable(drawable_Malaysia);

        Drawable drawable_Colombia =
ResourcesCompat.getDrawable(getResources(),R.drawable.colombia,null);
        mColumbiaView.setImageDrawable(drawable_Colombia);

        Drawable drawable_Indonesia =
ResourcesCompat.getDrawable(getResources(),R.drawable.indonesia,null);
        mIndonesiaView.setImageDrawable(drawable_Indonesia);

        mEditText = (EditText) findViewById(R.id.editText);

        mCategoryTextView.setText("");
        mEditText.setVisibility(View.GONE);
        spinner.setVisibility(View.GONE);
```

```java
    }


    public void getCurrency(View view){
        //display all currency mode
        mEditText.setVisibility(View.VISIBLE);
        spinner.setVisibility(View.VISIBLE);



        mCategoryTextView.setText("Currency");


        mUSText4.setText("USD(US$)");
        mCanadaText4.setText("CAD(C$)");
        mChinatext4.setText("CNY()");
        mIndiatext4.setText("INR()");
        mKoreatext4.setText("KRW()");
        mTaiwantext4.setText("NTD(NT$)");
        mMalaysiatext4.setText("MYR(RM)");
        mColumbiatext4.setText("COP(COL$)");
        mIndonesiatext4.setText("IDR(Rp)");

        //add onclicklistener for both edittext and spinner


        mEditText.addTextChangedListener(new TextWatcher() {
            @Override
            public void beforeTextChanged(CharSequence charSequence, int
i, int i1, int i2) {

            }

            @Override
            public void onTextChanged(CharSequence charSequence, int i,
int i1, int i2) {

            }

            @Override
            public void afterTextChanged(Editable editable) {
                if (editable.length() == 0){
                    mUSText3.setText("0.0");
                    mCanadaText3.setText("0.0");
                    mKoreatext3.setText("0.0");
```

```java
                    mChinatext3.setText("0.0");
                    mTaiwantext3.setText("0.0");
                    mIndonesiatext3.setText("0.0");
                    mMalaysiatext3.setText("0.0");
                    mIndiatext3.setText("0.0");
                    mColumbiatext3.setText("0.0");


            }
            else{
                mUSText3.setText(editable);
                num = Double.parseDouble(editable.toString());
                Double USnum = num * usVal;
                Double CADnum = num * cadVal;
                Double Indonum = num * indoVal;
                Double Chinanum = num * chinaVal;
                Double Taiwanum = num * taiVal;
                Double Colnum = num * colVal;
                Double Malaynum = num * malayVal;
                Double Indianum = num * indiaVal;
                Double KORnum = num * korVal;

                DecimalFormat df = new DecimalFormat("#.##");



                mUSText3.setText(df.format(USnum));
                mCanadaText3.setText(df.format(CADnum));
                mKoreatext3.setText(df.format(KORnum));
                mChinatext3.setText(df.format(Chinanum));
                mTaiwantext3.setText(df.format(Taiwanum));
                mColumbiatext3.setText(df.format(Colnum));
                mMalaysiatext3.setText(df.format(Malaynum));
                mIndonesiatext3.setText(df.format(Indonum));
                mIndiatext3.setText(df.format(Indianum));


            }
        }
    });


    //Create an ArrayAdapter using the string array and a default
spinner layout
    ArrayAdapter<String> adapter = new ArrayAdapter<String>
            (this,
```

```java
        android.R.layout.simple_spinner_item,Countries_Currency );

        //specify the layout to use when the list of choices appears

adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);

        //place each view-item inside listview by setting adapter for our
listview
        spinner.setAdapter(adapter);
        spinner.setOnItemSelectedListener(new
AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> adapterView, View
view, int position, long l) {
                String con = Countries_Currency[position];
                //Toast.makeText(getApplicationContext(),con,
Toast.LENGTH_SHORT).show();


                if(con.equals("USD")){
                    cadVal = 1.3;
                    korVal = 1181.0;
                    usVal = 1.0;
                    indiaVal = 71.0;
                    colVal = 3453.29;
                    taiVal = 30.59;
                    indoVal = 14144.0;
                    chinaVal=7.08 ;
                    malayVal =4.19 ;

                 }
                else if(con.equals("CAD")){
                    usVal = 0.76;
                    korVal = 898.87;
                    cadVal = 1.0;
                    indiaVal = 54.15;
                    colVal = 2629.23;
                    taiVal = 23.29;
                    indoVal = 10756.25;
                    chinaVal=5.39 ;
                    malayVal =3.19 ;

                }
```

```java
		else if(con.equals("CNY")){
		    usVal = 0.14;
		    korVal = 166.72;
		    cadVal = 0.19;
		    indiaVal = 10.04;
		    colVal = 487.6;
		    taiVal = 4.32;
		    indoVal = 1998.04;
		    chinaVal= 1.0 ;
		    malayVal =0.59 ;
		}
		else if(con.equals("INR")){
		    usVal = 0.014;
		    korVal = 16.60;
		    cadVal = 0.018;
		    indiaVal = 1.0;
		    colVal = 48.56;
		    taiVal = 0.43;
		    indoVal = 199.07;
		    chinaVal= 0.1;
		    malayVal =0.059 ;
		}
		else if(con.equals("KRW")){
		    usVal = 0.00085;
		    korVal = 1.0;
		    cadVal = 0.0011;
		    indiaVal = 0.060;
		    colVal = 2.93;
		    taiVal = 0.026;
		    indoVal = 11.97;
		    chinaVal= 0.006;
		    malayVal =0.0035 ;
		}
		else if(con.equals("NTD")){
		    usVal = 0.033;
		    korVal = 38.59;
		    cadVal = 0.043;
		    indiaVal = 2.32;
		    colVal = 112.91;
		    taiVal = 1.0;
		    indoVal = 462.69;
		    chinaVal= 0.23 ;
		    malayVal =0.14 ;
		}
		else if(con.equals("MYR")){
		    usVal = 0.24;
		    korVal = 281.94;
		    cadVal = 0.31;
```

```java
            indiaVal = 16.99;
            colVal = 825.04;
            taiVal = 7.31;
            indoVal = 3384.3;
            chinaVal= 1.69 ;
            malayVal =1.0 ;
        }
        else if(con.equals("COP")){
            usVal = 0.00029;
            korVal = 0.34;
            cadVal = 0.00038;
            indiaVal = 0.021;
            colVal = 1.0;
            taiVal = 0.0089;
            indoVal = 4.10;
            chinaVal= 0.0021;
            malayVal =0.0012 ;
        }
        else if(con.equals("IDR")){
            usVal = 0.000071;
            korVal = 0.084;
            cadVal = 0.000093;
            indiaVal = 0.005;
            colVal = 0.24;
            taiVal = 0.0022;
            indoVal = 1.0;
            chinaVal= 0.0005 ;
            malayVal =0.0003 ;
        }
        DecimalFormat df = new DecimalFormat("#.##");

        Double us1 = usVal   * num;
        Double kor1 = korVal   * num;
        Double cad1 = cadVal * num;
        Double tai1 = taiVal * num;
        Double indo1 = indoVal * num;
        Double indi1= indiaVal* num;
        Double malay1=malayVal *num;
        Double col1 = colVal * num;
        Double chi1 = chinaVal * num;



        mUSText3.setText(df.format(us1));
        mCanadaText3.setText(df.format(cad1));
        mKoreatext3.setText(df.format(kor1));
        mChinatext3.setText(df.format(chi1));
        mTaiwantext3.setText(df.format(tai1));
```

```java
                mMalaysiatext3.setText(df.format(malay1));
                mColumbiatext3.setText(df.format(col1));
                mIndiatext3.setText(df.format(indi1));
                mIndonesiatext3.setText(df.format(indo1));
            }

            @Override
            public void onNothingSelected(AdapterView<?> adapterView) {

            }
        });

    }



    public void getTime(View view){
        //display all time mode
        mCategoryTextView.setText("Time");


        mEditText.setVisibility(View.VISIBLE);
        spinner.setVisibility(View.VISIBLE);

        mUSText4.setText("");
        mCanadaText4.setText("");
        mChinatext4.setText("");
        mKoreatext4.setText("");
        mIndiatext4.setText("");
        mTaiwantext4.setText("");
        mIndonesiatext4.setText("");
        mColumbiatext4.setText("");
        mMalaysiatext4.setText("");

        DateFormat dateFormat = new SimpleDateFormat("kk:mm");
        Date date = new Date();
        mUSText3.setText(dateFormat.format(date));



        mEditText.addTextChangedListener(new TextWatcher() {
            @Override
            public void beforeTextChanged(CharSequence charSequence, int
i, int i1, int i2) {
```

```java
                }

            @Override
            public void onTextChanged(CharSequence charSequence, int i,
int i1, int i2) {

            }

            @Override
            public void afterTextChanged(Editable editable) {
                if (editable.length() == 5) {
                    String hour = editable.toString().substring(0,2);
                    String min = editable.toString().substring(3);

                    Integer numHour = Integer.parseInt(hour);
                    Integer numMin = Integer.parseInt(min);



                    mUSText3.setText(hour+":"+min);
                }
            }

        });


        //add onclicklistener for both edittext and spinner
        spinner = (Spinner)findViewById(R.id.spinner);

        //Create an ArrayAdapter using the string array and a default
spinner layout
        ArrayAdapter<String> adapter = new ArrayAdapter<String>
                (this,
android.R.layout.simple_spinner_item,Countries_Time );

        //specify the layout to use when the list of choices appears

adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_i
tem);

        //place each view-item inside listview by setting adapter for our
listview
        spinner.setAdapter(adapter);
        spinner.setOnItemSelectedListener(new
AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> adapterView, View
```

```java
view, int position, long l) {
            String con = Countries_Time[position];
            //Toast.makeText(getApplicationContext(),con,
Toast.LENGTH_SHORT).show();


            if(con.equals("US")){


            }
            else if(con.equals("Canada")){

            }
            else if(con.equals("China")){

            }
            else if(con.equals("India")){

            }
            else if(con.equals("Korea")){

            }
            else if(con.equals("Taiwan")){

            }
            else if(con.equals("Malaysia")){

            }
            else if(con.equals("Colombia")){

            }
            else if(con.equals("Indonesia")){

            }

        }

        @Override
        public void onNothingSelected(AdapterView<?> adapterView) {

        }
    });

    }
```

```java
    public void getInfo(View view){
        Intent mintent = new Intent(this,Information.class);
        startActivity(mintent);
    }
}
```

<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" >

    <TableLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content">

        <TableRow
            android:layout_height="wrap_content"
            android:layout_width="match_parent">

            <Button
                android:id="@+id/Button1"
                android:layout_width="120dp"
                android:layout_height="120dp"
                android:layout_column="1"
                android:layout_weight="1"
                android:background="@drawable/dollars"
                android:onClick="getCurrency"
                />

            <Button
                android:id="@+id/Button2"
                android:layout_width="120dp"
                android:layout_height="120dp"
                android:background="@drawable/time"
                android:layout_weight="1"
                android:layout_column="2"
                android:onClick="getTime"/>
```

```xml
        <Button
            android:id="@+id/Button3"
            android:layout_width="120dp"
            android:layout_height="120dp"
            android:layout_weight="1"
            android:background="@drawable/info"
            android:layout_column="3"
            android:onClick="getInfo"/>
    </TableRow>

    <TableRow>

        <TextView
            android:text="@string/currency"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:layout_column="1"
            android:gravity="center"
        />

        <TextView
            android:text="@string/time"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:layout_column="2"
            android:gravity="center"
            />

        <TextView
            android:text="@string/info"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:layout_column="3"
            android:gravity="center"
            />

    </TableRow>
</TableLayout>

<TextView
    android:id="@+id/CategoryTextView"
    android:layout_width="match_parent"
    android:layout_height="42dp"
    android:gravity="center"
    android:text="Currency"
```

```xml
            android:textSize="30dp"
            android:textColor="@color/colorWhite"
            android:background="@color/colorLightGreen"/>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <EditText
            android:id="@+id/editText"
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:layout_weight="1"
            android:text="" />

        <Spinner
            android:id="@+id/spinner"
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:layout_weight="2" />

    </LinearLayout>

    <TableLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_weight="1">

        <TableRow
            android:layout_width="match_parent"
            android:layout_height="match_parent">
        <TextView
            android:id="@+id/UnitedStates"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="United States"
            android:layout_column="1"
            android:layout_row ="1"/>

            <ImageView
                android:id="@+id/UnitedStatesView"
                android:layout_width="40dp"
                android:layout_height="40dp"
                android:layout_column="2"
                android:contentDescription="image of champions"
                tools:srcCompat="@drawable/unitedstates" />
```

```xml
        <TextView
            android:id="@+id/USText3"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="3"
            android:text="000"
            android:textColor="@color/colorHotPink" />

        <TextView
            android:id="@+id/USText4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="4"
            android:text="USD(US$)" />
    </TableRow>



    <TableRow
        android:layout_width="match_parent"
        android:layout_height="match_parent">
        <TextView
            android:id="@+id/Canada"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Canada"
            android:layout_column="1"/>

        <ImageView
            android:id="@+id/CanadaView"
            android:layout_width="40dp"
            android:layout_height="40dp"
            android:layout_column="2"
            android:contentDescription="image of champions"
            tools:srcCompat="@drawable/canada" />

        <TextView
            android:id="@+id/CanadaText3"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="3"
            android:text="000"
            android:textColor="@color/colorHotPink" />

        <TextView
            android:id="@+id/CanadaText4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
```

```xml
            android:layout_column="4"
            android:text="CAD($)" />
    </TableRow>




    <TableRow
        android:layout_width="match_parent"
        android:layout_height="match_parent">

        <TextView
            android:id="@+id/China"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="China"
            android:layout_column="1"/>
        <ImageView
            android:id="@+id/ChinaView"
            android:layout_width="40dp"
            android:layout_height="40dp"
            android:layout_column="2"
            android:contentDescription="image of champions"
            tools:srcCompat="@drawable/china" />

        <TextView
            android:id="@+id/ChinaText3"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="3"
            android:text="000"
            android:textColor="@color/colorHotPink" />

        <TextView
            android:id="@+id/ChinaText4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="4"
            android:text="CNY" />

    </TableRow>




    <TableRow
```

```xml
        android:layout_width="match_parent"
        android:layout_height="match_parent">

    <TextView
        android:id="@+id/India"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="India"
        android:layout_column="1"/>
    <ImageView
        android:id="@+id/IndiaView"
        android:layout_width="40dp"
        android:layout_height="40dp"
        android:layout_column="2"
        android:contentDescription="image of champions"
        tools:srcCompat="@drawable/india" />

    <TextView
        android:id="@+id/IndiaText3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_column="3"
        android:text="000"
        android:textColor="@color/colorHotPink" />

    <TextView
        android:id="@+id/IndiaText4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_column="4"
        android:text="INR" />

</TableRow>


<TableRow
        android:layout_width="match_parent"
        android:layout_height="match_parent">
    <TextView
        android:id="@+id/Korea"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Korea"
        android:layout_column="1"/>

    <ImageView
        android:id="@+id/KoreaView"
```

```xml
        android:layout_width="40dp"
        android:layout_height="40dp"
        android:layout_column="2"
        android:contentDescription="image of champions"
        tools:srcCompat="@drawable/southkorea" />

    <TextView
        android:id="@+id/KoreaText3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_column="3"
        android:text="000"
        android:textColor="@color/colorHotPink" />

    <TextView
        android:id="@+id/KoreaText4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_column="4"
        android:text="CRW" />
</TableRow>



<TableRow
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <TextView
        android:id="@+id/Taiwan"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Taiwan"
        android:layout_column="1"/>

    <ImageView
        android:id="@+id/TaiwanView"
        android:layout_width="40dp"
        android:layout_height="40dp"
        android:layout_column="2"
        android:contentDescription="image of champions"
        tools:srcCompat="@drawable/taiwan" />

    <TextView
        android:id="@+id/TaiwanText3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_column="3"
        android:text="000"
```

```xml
            android:textColor="@color/colorHotPink" />

        <TextView
            android:id="@+id/TaiwanText4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="4"
            android:text="NTD" />
    </TableRow>
    <TableRow
        android:layout_width="match_parent"
        android:layout_height="match_parent">

        <TextView
            android:id="@+id/Malaysia"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Malaysia"
            android:layout_column="1"/>

        <ImageView
            android:id="@+id/MalaysiaView"
            android:layout_width="40dp"
            android:layout_height="40dp"
            android:layout_column="2"
            android:contentDescription="image of champions"
            tools:srcCompat="@drawable/malaysia" />

        <TextView
            android:id="@+id/MalaysiaText3"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="3"
            android:text="000"
            android:textColor="@color/colorHotPink" />

        <TextView
            android:id="@+id/MalaysiaText4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="4"
            android:text="MYR" />
    </TableRow>

    <TableRow
        android:layout_width="match_parent"
        android:layout_height="match_parent">
```

```xml
        <TextView
            android:id="@+id/Columbia"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Colombia"
            android:layout_column="1"/>

        <ImageView
            android:id="@+id/ColumbiaView"
            android:layout_width="40dp"
            android:layout_height="40dp"
            android:layout_column="2"
            android:contentDescription="image of champions"
            tools:srcCompat="@drawable/colombia" />

        <TextView
            android:id="@+id/ColumbiaText3"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="3"
            android:text="000"
            android:textColor="@color/colorHotPink" />

        <TextView
            android:id="@+id/ColumbiaText4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_column="4"
            android:text="COP" />
    </TableRow>

    <TableRow
        android:layout_width="match_parent"
        android:layout_height="match_parent">


        <TextView
            android:id="@+id/Indonesia"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Indonesia"
            android:layout_column="1"/>

        <ImageView
            android:id="@+id/IndonesiaView"
            android:layout_width="40dp"
            android:layout_height="40dp"
```

```xml
                android:layout_column="2"
                android:contentDescription="image of champions"
                tools:srcCompat="@drawable/indonesia" />

            <TextView
                android:id="@+id/IndonesiaText3"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_column="3"
                android:text="000"
                android:textColor="@color/colorHotPink" />

            <TextView
                android:id="@+id/IndonesiaText4"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_column="4"
                android:text="IDR(RP)" />
        </TableRow>




    </TableLayout>


</LinearLayout>
```

<Console Output>

10/18 06:35:24: Launching 'app' on samsung SM-G965N.

$ adb shell am start -n
"org.cnit355jieun.converterapp_jy/org.cnit355jieun.converterapp_jy.MainActivity" -a
android.intent.action.MAIN -c android.intent.category.LAUNCHER

Waiting for process to come online...

Connected to process 16478 on device 'samsung-sm_g965n-1cba26406a0c7ece'.

Capturing and displaying logcat messages from application. This behavior can be disabled in the "Logcat output" section of the "Debugger" settings page.

D/ConnectivityManager_URSP: Ursp sIsUrsp=false, sIsCheckUrsp=false, uid=10295

D/Proxy: urspP is null: 10295

D/libEGL: loaded /vendor/lib64/egl/libGLES_mali.so

W/converterapp_j: Accessing hidden method Landroid/view/View;->computeFitSystemWindows(Landroid/graphics/Rect;Landroid/graphics/Rect;)Z (light greylist, reflection)

W/converterapp_j: Accessing hidden method Landroid/view/ViewGroup;->makeOptionalFitsSystemWindows()V (light greylist, reflection)

I/converterapp_j: Compiler allocated 4MB to compile void android.widget.TextView.<init>(android.content.Context, android.util.AttributeSet, int, int)

D/OpenGLRenderer: Skia GL Pipeline

D/EmergencyMode: [EmergencyManager] android createPackageContext successful

D/InputTransport: Input channel constructed: fd=63

D/ViewRootImpl@f905af3[MainActivity]: setView = DecorView@71ef3b0[MainActivity] TM=true MM=false

D/ViewRootImpl@f905af3[MainActivity]: dispatchAttachedToWindow

D/ViewRootImpl@f905af3[MainActivity]: Relayout returned: old=[0,0][1080,2220] new=[0,0][1080,2220] result=0x7 surface={valid=true 504357695488} changed=true

I/ConfigStore: android::hardware::configstore::V1_0::ISurfaceFlingerConfigs::hasWideColorDisplay retrieved: 0

I/ConfigStore: android::hardware::configstore::V1_0::ISurfaceFlingerConfigs::hasHDRDisplay retrieved: 0

I/OpenGLRenderer: Initialized EGL, version 1.4

D/OpenGLRenderer: Swap behavior 2

D/mali_winsys: EGLint new_window_surface(egl_winsys_display *, void *, EGLSurface, EGLConfig, egl_winsys_surface **, EGLBoolean) returns 0x3000

D/OpenGLRenderer: eglCreateWindowSurface = 0x75646b3c80, 0x756e0fb010

D/ViewRootImpl@f905af3[MainActivity]: MSG_WINDOW_FOCUS_CHANGED 1 1

D/InputMethodManager: prepareNavigationBarInfo() DecorView@71ef3b0[MainActivity]

  getNavigationBarColor() -855310

D/InputMethodManager: prepareNavigationBarInfo() DecorView@71ef3b0[MainActivity]

  getNavigationBarColor() -855310

V/InputMethodManager: Starting input: tba=org.cnit355jieun.converterapp_jy ic=null mNaviBarColor -855310 mIsGetNaviBarColorSuccess true , NavVisible : true , NavTrans : false

D/InputMethodManager: startInputInner - Id : 0

I/InputMethodManager: startInputInner - mService.startInputOrWindowGainedFocus

D/ViewRootImpl@f905af3[MainActivity]: MSG_RESIZED_REPORT: frame=Rect(0, 0 - 1080, 2220) ci=Rect(0, 63 - 0, 126) vi=Rect(0, 63 - 0, 126) or=1

D/InputTransport: Input channel constructed: fd=74

D/InputMethodManager: prepareNavigationBarInfo() DecorView@71ef3b0[MainActivity]

  getNavigationBarColor() -855310

V/InputMethodManager: Starting input: tba=org.cnit355jieun.converterapp_jy ic=null mNaviBarColor - 855310 mIsGetNaviBarColorSuccess true , NavVisible : true , NavTrans : false

D/InputMethodManager: startInputInner - Id : 0

D/ViewRootImpl@f905af3[MainActivity]: ViewPostIme pointer 0

D/ViewRootImpl@f905af3[MainActivity]: ViewPostIme pointer 1

D/ViewRootImpl@f905af3[MainActivity]: ViewPostIme pointer 0

D/ViewRootImpl@f905af3[MainActivity]: ViewPostIme pointer 1

D/InputMethodManager: prepareNavigationBarInfo() DecorView@71ef3b0[MainActivity]

  getNavigationBarColor() -855310

V/InputMethodManager: Starting input: tba=org.cnit355jieun.converterapp_jy ic=com.android.internal.widget.EditableInputConnection@4a4bca6 mNaviBarColor -855310 mIsGetNaviBarColorSuccess true , NavVisible : true , NavTrans : false

D/InputMethodManager: startInputInner - Id : 0

I/InputMethodManager: startInputInner - mService.startInputOrWindowGainedFocus

D/InputTransport: Input channel constructed: fd=75

D/InputTransport: Input channel destroyed: fd=74

D/InputMethodManager: SSI - flag : 0 Pid : 16478 view : org.cnit355jieun.converterapp_jy

  prepareNavigationBarInfo() DecorView@71ef3b0[MainActivity]

D/InputMethodManager: getNavigationBarColor() -855310

I/AssistStructure: Flattened final assist data: 10960 bytes, containing 1 windows, 43 views

D/ViewRootImpl@f905af3[MainActivity]: MSG_RESIZED: frame=Rect(0, 0 - 1080, 2220) ci=Rect(0, 63 - 0, 126) vi=Rect(0, 63 - 0, 1003) or=1

D/ViewRootImpl@f905af3[MainActivity]: ViewPostIme pointer 0

D/ViewRootImpl@f905af3[MainActivity]: ViewPostIme pointer 1

D/InputMethodManager: SSI - flag : 0 Pid : 16478 view : org.cnit355jieun.converterapp_jy

D/InputMethodManager: prepareNavigationBarInfo() DecorView@71ef3b0[MainActivity]

D/InputMethodManager: getNavigationBarColor() -855310

D/ViewRootImpl@f905af3[MainActivity]: ViewPostIme key 1

D/ViewRootImpl@f905af3[MainActivity]: ViewPostIme key 1

I/converterapp_j: Compiler allocated 4MB to compile void
android.view.ViewRootImpl.performTraversals()

D/InputMethodManager: prepareNavigationBarInfo() DecorView@71ef3b0[MainActivity]

D/InputMethodManager: getNavigationBarColor() -855310

V/InputMethodManager: Starting input: tba=org.cnit355jieun.converterapp_jy
ic=com.android.internal.widget.EditableInputConnection@7aa23ad mNaviBarColor -855310
mIsGetNaviBarColorSuccess true , NavVisible : true , NavTrans : false

D/InputMethodManager: startInputInner - Id : 0

I/InputMethodManager: startInputInner - mService.startInputOrWindowGainedFocus

D/InputTransport: Input channel constructed: fd=74

D/InputTransport: Input channel destroyed: fd=75

W/IInputConnectionWrapper: getExtractedText on inactive InputConnection

D/ViewRootImpl@f905af3[MainActivity]: MSG_RESIZED_REPORT: frame=Rect(0, 0 - 1080, 2220)
ci=Rect(0, 63 - 0, 126) vi=Rect(0, 63 - 0, 126) or=1

D/ViewRootImpl@f905af3[MainActivity]: MSG_WINDOW_FOCUS_CHANGED 0 1

D/InputMethodManager: prepareNavigationBarInfo() DecorView@71ef3b0[MainActivity]

  getNavigationBarColor() -855310

W/libEGL: EGLNativeWindowType 0x756e0fb010 disconnect failed

D/OpenGLRenderer: eglDestroySurface = 0x75646b3c80, 0x756e0fb000

D/ViewRootImpl@f905af3[MainActivity]: Relayout returned: old=[0,0][1080,2220]
new=[0,0][1080,2220] result=0x5 surface={valid=false 0} changed=true

Process 16478 terminated.

==SECOND ACTIVITY(for information section)==

<Java Source Codes>

```java
package org.cnit355jieun.converterapp_jy;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

import org.w3c.dom.Text;

public class Information extends AppCompatActivity {

    TextView title;
    TextView minfo;
    Button mButton;

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

        mButton = findViewById(R.id.button);
        title = findViewById(R.id.textView);

        minfo = findViewById(R.id.informationText);
        minfo.setText("Thank you for using this unit converter. " +
                " This app was developed as part of Purdue CNIT 355 programming assignment. " +
                "If you have any questions, please email at you44@purdue.edu.");

    }

    public void MoveToMainActivity(View view){
        finish();
    }
}
```

<XML>

```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"
```

```xml
    android:layout_height="match_parent"
    tools:context=".Information">

    <TextView
        android:id="@+id/textView"
        android:layout_width="413dp"
        android:layout_height="65dp"
        android:text="Information"
        android:gravity="center"
        android:textSize="30dp"
        android:background="@color/colorLightGreen"
        android:textColor="@color/colorWhite"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.0" />

    <TextView
        android:id="@+id/informationText"
        android:layout_width="327dp"
        android:layout_height="255dp"
        android:text="TextView"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        app:layout_constraintVertical_bias="0.072" />

    <Button
        android:id="@+id/button"
        android:layout_width="160dp"
        android:layout_height="61dp"
        android:onClick="MoveToMainActivity"
        android:text="Close"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/informationText"
        app:layout_constraintVertical_bias="0.363" />

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

Description of the Application and its functions

The layout of the application includes Linear Layout (both horizontal and vertical) and table layout. The second activity utilizes constraint layout.

There are 3 buttons, "Currency", "Time", "Info". They all utilize "onClick" functions. Each onClick function is named as "getCurrency", "getTime", and "getInfo".

"Currency" category works as it should. It has spinner attached to it with list of 9 countries. It incorporates "TextWatcher" where a certain amount is entered in EditText, it the immediately changes other countries' amount of money. Since the EditText has to get number in order to do calculations, I Parsed the String into Double(since it is currency, includes decimal points). Also, I had problem of having too long decimal points. So I used "format" where I set the decimal limit to 2 decimal places.

The application's "Time" category is partially working. It does have spinner populated. It displays the "current time" of US when it is first clicked. This was done by getting current time from the `import java.util.Date;` and formatting the time as `DateFormat dateFormat = new SimpleDateFormat("kk:mm");`To show the hours and minutes. I also used "substring" to partially get the first 2 character of hour and last 2 character of minutes. `String hour = editable.toString().substring(0,2);`
`                    String min = editable.toString().substring(3);`

Therefore "Time" category is displays the time written on the EditText to US textbox with red text. However, the app crashes when I use "Currency" category first and then try to type something in "Time" category.

"Information" category works fine. It incorporated Intent where it can transition to another activity and show the information it should. It also has a "Close" button to exit the second activity and return to the main activity.