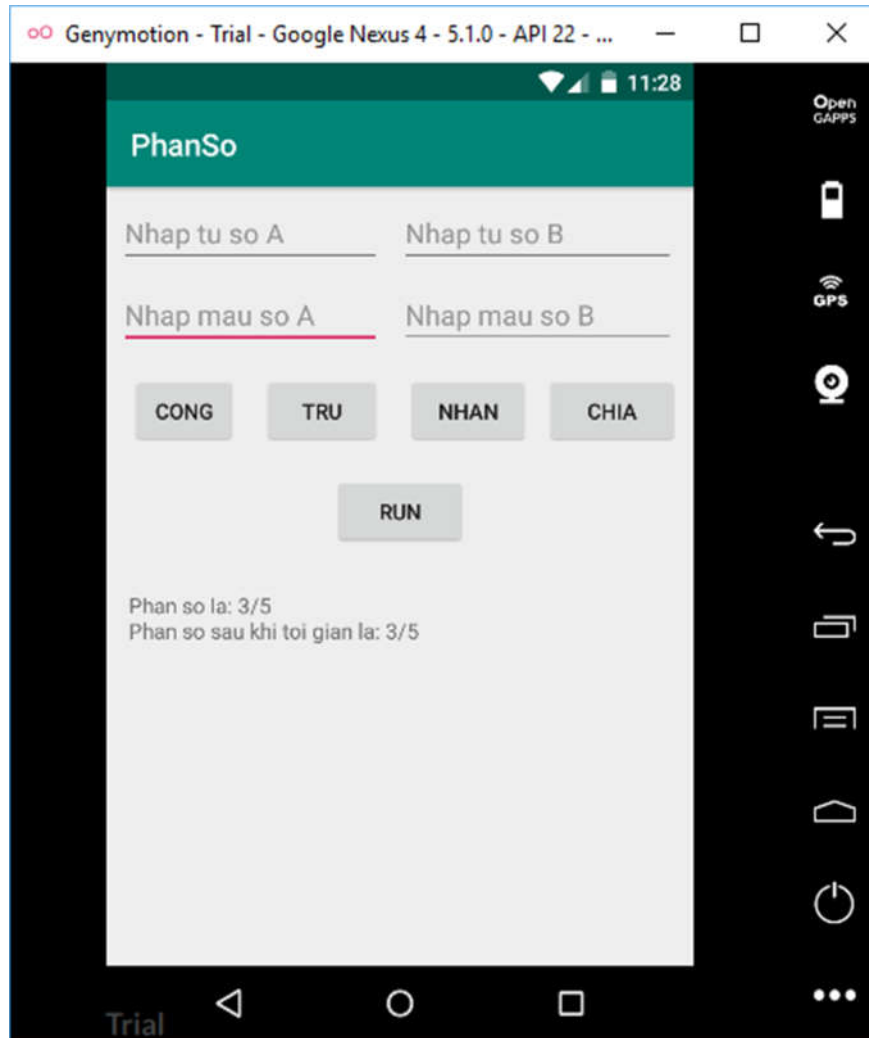# Lab 2: Xây dựng ứng dụng phân số

- Hiểu và Thiết kế giao diện
- Xây dựng lớp PhanSo và các chức năng
- Xử lí sự kiện các buttons
- Lấy và đưa giá trị trên EditText và TextView

1. Giao diện


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

    <TextView
```

```xml
        android:id="@+id/tvHienThi"
        android:layout_width="355dp"
        android:layout_height="238dp"
        android:layout_marginBottom="8dp"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent" />

    <Button
        android:id="@+id/btRun"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:layout_marginLeft="8dp"
        android:layout_marginEnd="8dp"
        android:layout_marginRight="8dp"
        android:layout_marginBottom="28dp"
        android:onClick="btRun_onClick"
        android:text="Run"
        app:layout_constraintBottom_toTopOf="@+id/tvHienThi"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent" />

    <EditText
        android:id="@+id/etTuSo"
        android:layout_width="172dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:layout_marginLeft="8dp"
        android:layout_marginTop="8dp"
        android:ems="10"
        android:hint="Nhap tu so A"
        android:inputType="numberSigned"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/etMauSo"
        android:layout_width="172dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:layout_marginLeft="8dp"
        android:layout_marginTop="8dp"
        android:ems="10"
        android:hint="Nhap mau so A"
        android:inputType="numberSigned"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/etTuSo" />

    <EditText
        android:id="@+id/etTuSoB"
        android:layout_width="181dp"
```

```xml
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp"
    android:layout_marginLeft="8dp"
    android:layout_marginTop="8dp"
    android:layout_marginEnd="8dp"
    android:layout_marginRight="8dp"
    android:ems="10"
    android:hint="Nhap tu so B"
    android:inputType="numberSigned"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toEndOf="@+id/etTuSo"
    app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/etMauSoB"
    android:layout_width="181dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp"
    android:layout_marginLeft="8dp"
    android:layout_marginTop="8dp"
    android:layout_marginEnd="8dp"
    android:layout_marginRight="8dp"
    android:ems="10"
    android:hint="Nhap mau so B"
    android:inputType="numberSigned"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toEndOf="@+id/etMauSo"
    app:layout_constraintTop_toBottomOf="@+id/etTuSoB" />

<Button
    android:id="@+id/btCong"
    android:layout_width="70dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="16dp"
    android:layout_marginLeft="16dp"
    android:layout_marginTop="16dp"
    android:text="Cong"
    android:onClick="btCong_onClick"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/etMauSo" />

<Button
    android:id="@+id/btTru"
    android:layout_width="78dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="16dp"
    android:layout_marginLeft="16dp"
    android:layout_marginTop="16dp"
    android:text="Tru"
    android:onClick="btTru_onClick"
    app:layout_constraintStart_toEndOf="@+id/btCong"
    app:layout_constraintTop_toBottomOf="@+id/etMauSo" />
```

```xml
    <Button
        android:id="@+id/btNhan"
        android:layout_width="81dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="16dp"
        android:text="Nhan"
        android:onClick="btNhan_onClick"
        app:layout_constraintStart_toEndOf="@+id/btTru"
        app:layout_constraintTop_toBottomOf="@+id/etMauSoB" />

    <Button
        android:id="@+id/btChia"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginLeft="16dp"
        android:layout_marginTop="16dp"
        android:layout_marginEnd="16dp"
        android:layout_marginRight="16dp"
        android:text="Chia"
        android:onClick="btChia_onClick"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toEndOf="@+id/btNhan"
        app:layout_constraintTop_toBottomOf="@+id/etMauSoB" />

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

2. Lớp PhanSo

```java
package vn.edu.itdlu.hiepnm.phanso;

public class PhanSo {
    private int tuSo;
    int mauSo;

    public PhanSo(){
        this.tuSo = this.mauSo = 1;
    }

    public PhanSo(int valueTuSO, int valueMauSo){
        this.tuSo = valueTuSO;
        this.mauSo = valueMauSo;

    }

    public double tinhGiaTriPhanSo(){
        return this.tuSo / this.mauSo;
    }

    public String xuatPhanSo(){
        return this.tuSo + "/" + this.mauSo;
```

```java
    }

    public void toiGianPhanSo(){
        int uscln = this.timUocSoChungLonNhat(this.tuSo,
this.mauSo);
        this.tuSo = this.tuSo/uscln;
        this.mauSo = this.mauSo/uscln;
    }

    private int timUocSoChungLonNhat(int a, int b){
        if(a<0) a = -1*a;
        if(b<0) b = -1*b;
        while (a!=b){
            if(a>b) a = a-b;
            else b= b-a;
        }
        return a;
    }

    public PhanSo congHaiPhanSo(PhanSo b){
        PhanSo tong = new PhanSo(this.tuSo*b.mauSo +
b.tuSo*this.mauSo, this.mauSo*b.mauSo);
        tong.toiGianPhanSo();
        return tong;
    }

    public PhanSo truHaiPhanSo(PhanSo b){
        PhanSo hieu = new PhanSo(this.tuSo*b.mauSo -
b.tuSo*this.mauSo, this.mauSo*b.mauSo);
        hieu.toiGianPhanSo();
        return hieu;
    }

    public PhanSo nhanHaiPhanSo(PhanSo b){
        PhanSo tich = new PhanSo(this.tuSo*b.tuSo,
                                 this.mauSo*b.mauSo);
        tich.toiGianPhanSo();
        return tich;
    }

    public PhanSo chiaHaiPhanSo(PhanSo b){
        PhanSo thuong = new PhanSo(this.tuSo*b.mauSo,
this.mauSo*b.tuSo);
        thuong.toiGianPhanSo();
        return thuong;
    }
}
```

3. Xử lý các button Cộng, Trừ, Nhân, Chia, Run

```java
package vn.edu.itdlu.hiepnm.phanso;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
    TextView tvHienThi;
    Button btRun;
    Button btCong;
    Button btTru;
    Button btNhan;
    Button btChia;
    EditText etTuSo;
    EditText etMauSo;
    EditText etTuSoB;
    EditText etMauSoB;

    private void Map(){
        tvHienThi = (TextView)findViewById(R.id.tvHienThi);
        btRun = (Button)findViewById(R.id.btRun);

        btCong = (Button)findViewById(R.id.btCong);
        btTru = (Button)findViewById(R.id.btTru);
        btNhan = (Button)findViewById(R.id.btNhan);
        btChia = (Button)findViewById(R.id.btChia);

        etTuSo =(EditText)findViewById(R.id.etTuSo);
        etMauSo =(EditText)findViewById(R.id.etMauSo);
        etTuSoB =(EditText)findViewById(R.id.etTuSoB);
        etMauSoB =(EditText)findViewById(R.id.etMauSoB);
    }
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        this.Map();
    }

    public void btRun_onClick(View v) {

        int tuSo =
Integer.parseInt(this.etTuSo.getText().toString());
        int mauSo =
Integer.parseInt(this.etMauSo.getText().toString());

        PhanSo ps = new PhanSo(tuSo, mauSo);

        this.tvHienThi.setText("Phan so la: " + ps.xuatPhanSo());
        ps.toiGianPhanSo();
```

```java
            this.tvHienThi.setText(this.tvHienThi.getText() + "\r\n"
+
                    "Phan so sau khi toi gian la: " +
ps.xuatPhanSo());
    }



    public void btCong_onClick(View v){
        int tuSo =
Integer.parseInt(this.etTuSo.getText().toString());
        int mauSo =
Integer.parseInt(this.etMauSo.getText().toString());
        PhanSo psA = new PhanSo(tuSo, mauSo);

        tuSo =
Integer.parseInt(this.etTuSoB.getText().toString());
        mauSo =
Integer.parseInt(this.etMauSoB.getText().toString());
        PhanSo psB = new PhanSo(tuSo, mauSo);

        PhanSo psTong = psA.congHaiPhanSo(psB);
        this.tvHienThi.setText("Phan so tong la: " +
psTong.xuatPhanSo());
    }

    public void btTru_onClick(View v){
        int tuSo =
Integer.parseInt(this.etTuSo.getText().toString());
        int mauSo =
Integer.parseInt(this.etMauSo.getText().toString());
        PhanSo psA = new PhanSo(tuSo, mauSo);

        tuSo =
Integer.parseInt(this.etTuSoB.getText().toString());
        mauSo =
Integer.parseInt(this.etMauSoB.getText().toString());
        PhanSo psB = new PhanSo(tuSo, mauSo);

        PhanSo psHieu = psA.truHaiPhanSo(psB);
        this.tvHienThi.setText("Phan so hieu la: " +
psHieu.xuatPhanSo());
    }

    public void btNhan_onClick(View v){
        int tuSo =
Integer.parseInt(this.etTuSo.getText().toString());
        int mauSo =
Integer.parseInt(this.etMauSo.getText().toString());
        PhanSo psA = new PhanSo(tuSo, mauSo);

        tuSo =
Integer.parseInt(this.etTuSoB.getText().toString());
```

```java
        mauSo =
Integer.parseInt(this.etMauSoB.getText().toString());
        PhanSo psB = new PhanSo(tuSo, mauSo);

        PhanSo psTich = psA.nhanHaiPhanSo(psB);
        this.tvHienThi.setText("Phan so tich la: " +
psTich.xuatPhanSo());
    }

    public void btChia_onClick(View v){
        int tuSo =
Integer.parseInt(this.etTuSo.getText().toString());
        int mauSo =
Integer.parseInt(this.etMauSo.getText().toString());
        PhanSo psA = new PhanSo(tuSo, mauSo);

        tuSo =
Integer.parseInt(this.etTuSoB.getText().toString());
        mauSo =
Integer.parseInt(this.etMauSoB.getText().toString());
        PhanSo psB = new PhanSo(tuSo, mauSo);

        PhanSo psThuong = psA.chiaHaiPhanSo(psB);
        this.tvHienThi.setText("Phan so thuong la: " +
psThuong.xuatPhanSo());
    }
}
```