

1. Bài tập 1: Sử dụng Animation từ file XML

a) Mô tả ứng dụng

Định nghĩa các animation fade in/out, rotate, zoom in/out, move, blink, slide up, bounce, combine... bằng xml từ các animation cơ bản của Android gồm: ScaleAnimation, TranslateAnimation, RotateAnimation, AlphaAnimation để tạo hiệu ứng hiển thị ImageView.

b) Các bước thực hiện

- Xây dựng các file dims.xml

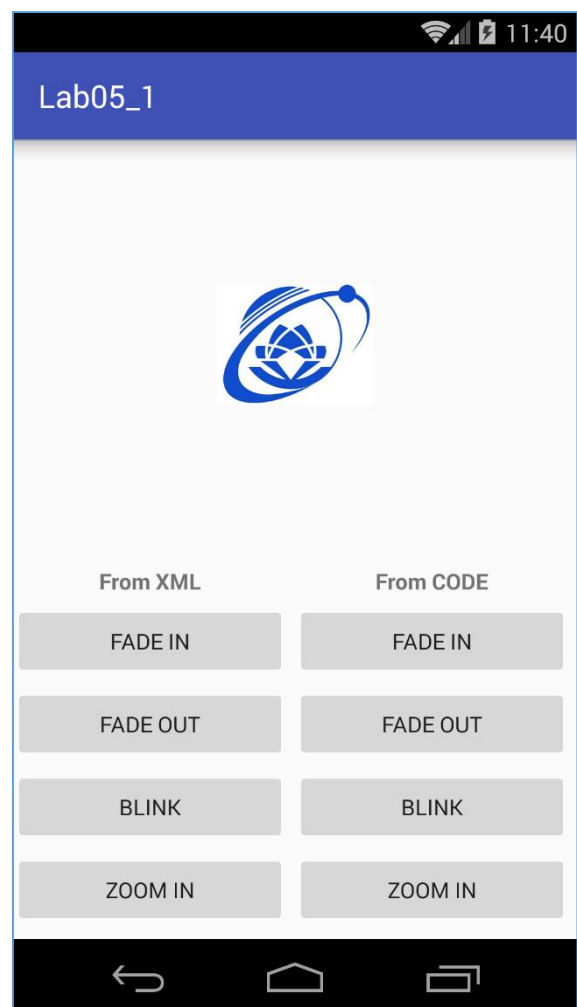
Name	Value
margin_base	5dp
margin_basex2	10dp
text_medium	16sp
image_base	100dp

- Xây dựng file strings.xml

Name	Value
from_xml	From XML
from_code	From CODE
fade_in	Fade In
fade_out	Fade Out
blink	Blink
zoom_in	Zoom In
zoom_out	Zoom Out
rotate	Rotate
move	Move
slide_up	Slide Up
bounce	Bounce
combine	Combine

- Xây dựng giao diện

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



```

        android:orientation="vertical"
        tools:context="uit.edu.vn.lab05_1.MainActivity">
        <FrameLayout
            android:layout_width="match_parent"
            android:layout_height="0dp"
            android:layout_weight="6">
        <ImageView
            android:id="@+id/iv_uit_logo"
            android:layout_width="@dimen/image_base"
            android:layout_height="@dimen/image_base"
            android:layout_gravity="center"
            android:scaleType="fitCenter"
            android:src="@drawable/uit_logo"/>
        </FrameLayout>
        <LinearLayout
            android:layout_marginTop="@dimen/margin_basex2"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:orientation="horizontal">
        <TextView
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/from_xml"
            android:gravity="center"
            android:textStyle="bold"
            android:layout_marginRight="@dimen/margin_base"/>
        <TextView
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/from_code"
            android:textStyle="bold"
            android:gravity="center"
            android:layout_marginRight="@dimen/margin_base"/>
        </LinearLayout>
        <ScrollView
            android:layout_width="match_parent"
            android:layout_height="0dp"
            android:layout_weight="5">
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:orientation="vertical">
        <LinearLayout
            android:layout_marginTop="@dimen/margin_base"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:orientation="horizontal">
        <Button
            android:id="@+id/btn_fade_in_xml"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/fade_in"
            android:gravity="center"
            android:layout_marginRight="@dimen/margin_base"/>
        <Button
            android:id="@+id/btn_fade_in_code"
            android:layout_width="0dp"

```

```

        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/fade_in"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
</LinearLayout>
<LinearLayout
    android:layout_marginTop="@dimen/margin_base"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <Button
        android:id="@+id/btn_fade_out_xml"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/fade_out"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
    <Button
        android:id="@+id/btn_fade_out_code"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/fade_out"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
</LinearLayout>
<LinearLayout
    android:layout_marginTop="@dimen/margin_base"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <Button
        android:id="@+id/btn_blink_xml"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/blink"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
    <Button
        android:id="@+id/btn_blink_code"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/blink"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
</LinearLayout>
<LinearLayout
    android:layout_marginTop="@dimen/margin_base"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <Button
        android:id="@+id/btn_zoom_in_xml"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"

```

```

        android:text="@string/zoom_in"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
    <Button
        android:id="@+id/btn_zoom_in_code"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/zoom_in"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
</LinearLayout>
<LinearLayout
    android:layout_marginTop="@dimen/margin_base"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <Button
        android:id="@+id/btn_zoom_out_xml"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/zoom_out"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
    <Button
        android:id="@+id/btn_zoom_out_code"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/zoom_out"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
</LinearLayout>
<LinearLayout
    android:layout_marginTop="@dimen/margin_base"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <Button
        android:id="@+id/btn_rotate_xml"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/rotate"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
    <Button
        android:id="@+id/btn_rotate_code"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/rotate"
        android:gravity="center"
        android:layout_marginRight="@dimen/margin_base"/>
</LinearLayout>
<LinearLayout
    android:layout_marginTop="@dimen/margin_base"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"

```

```

        android:orientation="horizontal">
        <Button
            android:id="@+id/btn_move_xml"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/move"
            android:gravity="center"
            android:layout_marginRight="@dimen/margin_base"/>
        <Button
            android:id="@+id/btn_move_code"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/move"
            android:gravity="center"
            android:layout_marginRight="@dimen/margin_base"/>
    </LinearLayout>
    <LinearLayout
        android:layout_marginTop="@dimen/margin_base"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">
        <Button
            android:id="@+id/btn_slide_up_xml"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/slide_up"
            android:gravity="center"
            android:layout_marginRight="@dimen/margin_base"/>
        <Button
            android:id="@+id/btn_slide_up_code"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/slide_up"
            android:gravity="center"
            android:layout_marginRight="@dimen/margin_base"/>
    </LinearLayout>
    <LinearLayout
        android:layout_marginTop="@dimen/margin_base"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">
        <Button
            android:id="@+id/btn_bounce_xml"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/bounce"
            android:gravity="center"
            android:layout_marginRight="@dimen/margin_base"/>
        <Button
            android:id="@+id/btn_bounce_code"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/bounce"
            android:gravity="center"
    
```

```

        android:layout_marginRight="@dimen/margin_base"/>
    </LinearLayout>
    <LinearLayout
        android:layout_marginTop="@dimen/margin_base"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">
        <Button
            android:id="@+id/btn_combine_xml"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/combine"
            android:gravity="center"
            android:layout_marginRight="@dimen/margin_base"/>
        <Button
            android:id="@+id/btn_combine_code"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/combine"
            android:gravity="center"
            android:layout_marginRight="@dimen/margin_base"/>
        </LinearLayout>
    </LinearLayout>
</ScrollView>

</LinearLayout>

```

- Định nghĩa animation Fade In trong file xml như sau
 - Tạo folder **anim** trong folder **res**
 - Tạo file **anim_fade_in.xml** trong folder **anim** với nội dung như sau

```

<?xml version="1.0" encoding="utf-8"?>
<set xmlns:android="http://schemas.android.com/apk/res/android"
    android:fillAfter="true" >

    <alpha
        android:duration="1000"
        android:fromAlpha="0.0"
        android:toAlpha="1.0" />

</set>

```

- Khai báo biến và xây dựng các hàm findViewByIds và InitVariables

```

private Button btnFadeInXml, btnFadeInCode, btnFadeOutXml, btnFadeOutCode,
    btnBlinkXml,
        btnBlinkCode, btnZoomInXml, btnZoomInCode, btnZoomOutXml,
    btnZoomOutCode, btnRotateXml,
        btnRotateCode, btnMoveXml, btnMoveCode, btnSlideUpXml, btnSlideUpCode,
    btnBounceXml,
        btnBounceCode, btnCombineXml, btnCombineCode;

```

```
private ImageView ivUitLogo;
private Animation.AnimationListener animationListener;

private void findViewsByIds() {
    ivUitLogo = (ImageView) findViewById(R.id.iv_uit_logo);
    btnFadeInXml = (Button) findViewById(R.id.btn_fade_in_xml);
    btnFadeInCode = (Button) findViewById(R.id.btn_fade_in_code);
    btnFadeOutXml = (Button) findViewById(R.id.btn_fade_out_xml);
    btnFadeOutCode = (Button) findViewById(R.id.btn_fade_out_code);
    btnBlinkXml = (Button) findViewById(R.id.btn_blink_xml);
    btnBlinkCode = (Button) findViewById(R.id.btn_blink_code);
    btnZoomInXml = (Button) findViewById(R.id.btn_zoom_in_xml);
    btnZoomInCode = (Button) findViewById(R.id.btn_zoom_in_code);
    btnZoomOutXml = (Button) findViewById(R.id.btn_zoom_out_xml);
    btnZoomOutCode = (Button) findViewById(R.id.btn_zoom_out_code);
    btnRotateXml = (Button) findViewById(R.id.btn_rotate_xml);
    btnRotateCode = (Button) findViewById(R.id.btn_rotate_code);
    btnMoveXml = (Button) findViewById(R.id.btn_move_xml);
    btnMoveCode = (Button) findViewById(R.id.btn_move_code);
    btnSlideUpXml = (Button) findViewById(R.id.btn_slide_up_xml);
    btnSlideUpCode = (Button) findViewById(R.id.btn_slide_up_code);
    btnBounceXml = (Button) findViewById(R.id.btn_bounce_xml);
    btnBounceCode = (Button) findViewById(R.id.btn_bounce_code);
    btnCombineXml = (Button) findViewById(R.id.btn_combine_xml);
    btnCombineCode = (Button) findViewById(R.id.btn_combine_code);
}

private void initVariables() {
    animationListener = new Animation.AnimationListener() {
        @Override
        public void onAnimationStart(Animation animation) {

        }

        @Override
        public void onAnimationEnd(Animation animation) {
            Toast.makeText(getApplicationContext(), "Animation Stopped",
                Toast.LENGTH_SHORT).show();
        }

        @Override
        public void onAnimationRepeat(Animation animation) {

        }
    };
}
```

- Override hàm onCreate để load và start Animation khi user nhấn vào button tương ứng:

```

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

    findViewsByIds();
    initVariables();

    // HandleClickAnimationXML
    // load the animation
    final Animation animation = AnimationUtils.loadAnimation(MainActivity.this,
        R.anim.anim_fade_in);

    // set animation listener
    animation.setAnimationListener(animationListener);

    // Handle onClickListener to start animation
    btnFadeInXml.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            ivUITLogo.startAnimation(animation);
        }
    });
}

```

Yêu cầu: Hiện tại, animation Fade In đã được gán cho ivUITLogo khi user nhấn btnFadeInXml. Sinh viên chỉnh sửa, bổ sung code để các animation hoạt động khi user nhấn vào các button (btn**Something**Xml) tương ứng.

Hướng dẫn: Sinh viên thực hiện các bước sau

- Định nghĩa các animation còn lại vào các file xml tương ứng

Tên file	Nội dung
anim_blink.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <set xmlns:android="http://schemas.android.com/apk/res/android" <alpha android:fromAlpha="0.0" android:toAlpha="1.0" android:duration="300" android:repeatMode="reverse" android:repeatCount="3"/> </set> </pre>
anim_bounce.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <set xmlns:android="http://schemas.android.com/apk/res/android" android:fillAfter="true" android:interpolator="@android:anim/bounce_interpolator"> <scale android:duration="500" android:fromXScale="1.0" android:fromYScale="0.0" android:toXScale="1.0" android:toYScale="1.0" /> </set> </pre>

anim_fade_out.xml	<pre><?xml version="1.0" encoding="utf-8"?> <set xmlns:android="http://schemas.android.com/apk/res/android" android:fillAfter="true" > <alpha android:duration="1000" android:fromAlpha="1.0" android:toAlpha="0.0" /> </set></pre>
anim_move.xml	<pre><?xml version="1.0" encoding="utf-8"?> <set xmlns:android="http://schemas.android.com/apk/res/android" android:interpolator="@android:anim/linear_interpolator" android:fillAfter="true"> <translate android:fromXDelta="0%p" android:toXDelta="75%p" android:duration="800" /> </set></pre>
anim_rotate.xml	<pre><?xml version="1.0" encoding="utf-8"?> <set xmlns:android="http://schemas.android.com/apk/res/android"> <rotate android:fromDegrees="0" android:toDegrees="360" android:pivotX="50%" android:pivotY="50%" android:duration="600" android:repeatMode="restart" android:repeatCount="2" android:interpolator="@android:anim/cycle_interpolator"/> </set></pre>
anim_slide_up.xml	<pre><?xml version="1.0" encoding="utf-8"?> <set xmlns:android="http://schemas.android.com/apk/res/android" android:fillAfter="true" > <scale android:duration="500" android:fromXScale="1.0" android:fromYScale="1.0" android:toXScale="1.0" android:toYScale="0.0" /> </set></pre>
anim_zoom_in.xml	<pre><?xml version="1.0" encoding="utf-8"?> <set xmlns:android="http://schemas.android.com/apk/res/android" android:fillAfter="true" > <scale xmlns:android="http://schemas.android.com/apk/res/android" android:duration="1000"</pre>

	<pre> android:fromXScale="1" android:fromYScale="1" android:pivotX="50%" android:pivotY="50%" android:toXScale="3" android:toYScale="3" > </scale> </set> </pre>
anim_zoom_out.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <set xmlns:android="http://schemas.android.com/apk/res/android" android:fillAfter="true" > <scale xmlns:android="http://schemas.android.com/apk/res/android" android:duration="1000" android:fromXScale="1.0" android:fromYScale="1.0" android:pivotX="50%" android:pivotY="50%" android:toXScale="0.5" android:toYScale="0.5" > </scale> </set> </pre>
anim_combine.xml	<pre> <?xml version="1.0" encoding="utf-8"?> <set xmlns:android="http://schemas.android.com/apk/res/android" android:fillAfter="true" android:interpolator="@android:anim/linear_interpolator" > <scale xmlns:android="http://schemas.android.com/apk/res/android" android:duration="4000" android:fromXScale="1" android:fromYScale="1" android:pivotX="50%" android:pivotY="50%" android:toXScale="3" android:toYScale="3" > </scale> <!-- Rotate 180 degrees --> <rotate android:duration="500" android:fromDegrees="0" android:pivotX="50%" android:pivotY="50%" android:repeatCount="2" android:repeatMode="restart" android:toDegrees="360" /> </set> </pre>

- Chuyển nội dung đoạn code **load animation từ xml và bắt sự kiện onClick cho button** (trong hàm onCreate ở trên) vào 1 hàm mới:

```
private void handleClickAnimationXml(Button btn, int animId)
{
    // Sinh viên tự sửa lại code cho phù hợp
}
```

Trong đó: btn sẽ được truyền vào là một Button và animId là id của file Xml tương ứng với animation cần set cho button đó.

- Cuối cùng, lần lượt gọi hàm handleClickAnimationXml trong hàm onCreate() như sau:

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

    findViewsByIds();
    initVariables();

    // HandleClickAnimationXML
    handleClickAnimationXml(btnFadeInXml, R.anim.anim_fade_in);
    handleClickAnimationXml(btnFadeOutXml, R.anim.anim_fade_out);
    handleClickAnimationXml(btnBlinkXml, R.anim.anim_blink);
    handleClickAnimationXml(btnZoomInXml, R.anim.anim_zoom_in);
    handleClickAnimationXml(btnZoomOutXml, R.anim.anim_zoom_out);
    handleClickAnimationXml(btnRotateXml, R.anim.anim_rotate);
    handleClickAnimationXml(btnMoveXml, R.anim.anim_move);
    handleClickAnimationXml(btnSlideUpXml, R.anim.anim_slide_up);
    handleClickAnimationXml(btnBounceXml, R.anim.anim_bounce);
    handleClickAnimationXml(btnCombineXml, R.anim.anim_combine);
}
```

2. Bài tập 2: Sử dụng Animation từ code

Sinh viên tiếp tục sử dụng nội dung thực hành ở Bài tập 1 để thực hiện tiếp Bài tập 2.

- Xây dựng hàm handleClickAnimationCode

```
private void handleClickAnimationCode(Button btn, final Animation animation) {
    // Handle onclickListener to start animation
    btn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
```

```
        ivUITLogo.startAnimation(animation);
    }
});
}
```

- Xây dựng hàm khởi tạo Fade In animation từ AlphaAnimation

```
private Animation initFadeInAnimation()
{
    AlphaAnimation animation = new AlphaAnimation(0f, 1f);
    animation.setDuration(3000);
    animation.setFillAfter(true);
    animation.setAnimationListener(animationListener);
    return animation;
}
```

- Gọi hàm xử lý sự kiện click button tương ứng trong hàm onCreate()

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

    findViewById();
    initVariables();

    // HandleClickAnimationXML
    handleClickAnimationXml(btnFadeInXml, R.anim.anim_fade_out);
    handleClickAnimationXml(btnFadeOutXml, R.anim.anim_fade_out);
    handleClickAnimationXml(btnBlinkXml, R.anim.anim_blink);
    handleClickAnimationXml(btnZoomInXml, R.anim.anim_zoom_in);
    handleClickAnimationXml(btnZoomOutXml, R.anim.anim_zoom_out);
    handleClickAnimationXml(btnRotateXml, R.anim.anim_rotate);
    handleClickAnimationXml(btnMoveXml, R.anim.anim_move);
    handleClickAnimationXml(btnSlideUpXml, R.anim.anim_slide_up);
    handleClickAnimationXml(btnBounceXml, R.anim.anim_bounce);
    handleClickAnimationXml(btnCombineXml, R.anim.anim_combine);

    // HandleClickAnimationCode
    handleClickAnimationCode(btnFadeInCode, initFadeInAnimation());
}
```

Yêu cầu: sinh viên tự xây dựng các hàm khởi để xử lý animation và gắn sự kiện click cho các **TẤT CẢ** các button

3. Bài tập 3: Tạo animation khi start Activity mới

Các bước thực hiện:

- Tạo một activity mới với giao diện như hình:



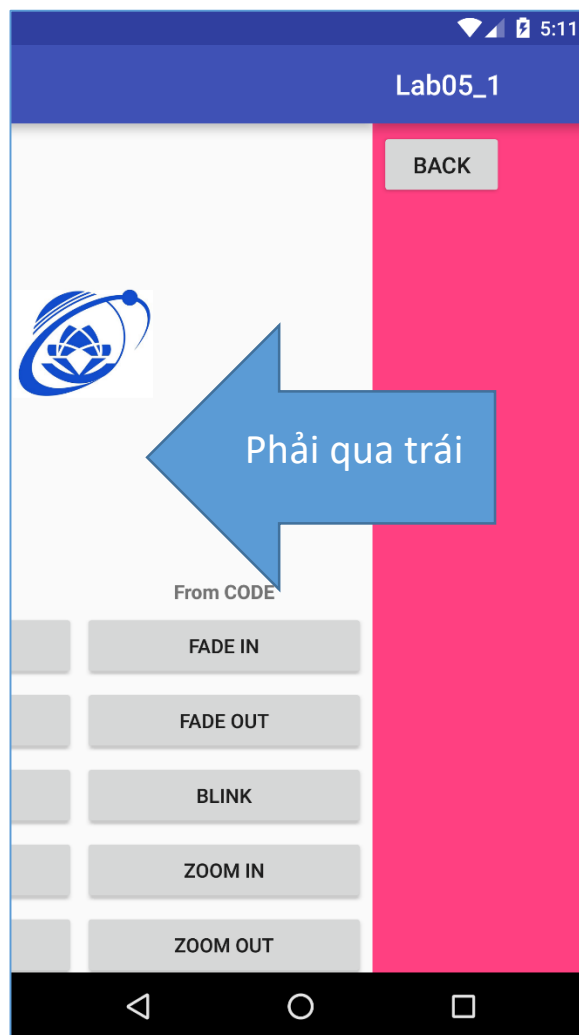
Khi user nhấn Back, ứng dụng sẽ finish activity hiện tại (new activity) để trở về MainActivity.

- Bắt sự kiện click ivUitLogo để start activity mới và set animation (fade in/out) khi chuyển đổi giữa 2 activity

```
// Start new activity when user clicks ivUITLogo
ivUITLogo.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent iNewActivity=new Intent(MainActivity.this, Main2Activity.class);
        startActivity(iNewActivity);

        overridePendingTransition(R.anim.anim_fade_in,R.anim.anim_fade_out);
    }
});
```

Yêu cầu: sinh viên đổi animation chuyển giữa 2 activity thành dạng new activity đẩy MainActivity từ phải qua trái như hình minh họa



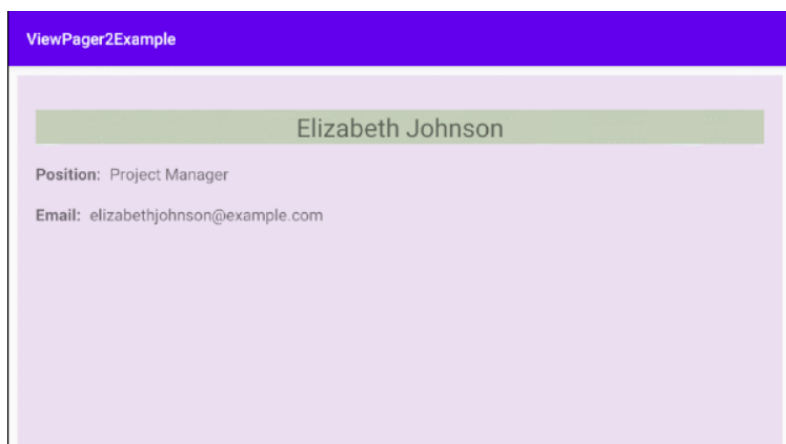
4. Bài tập 4: Sử dụng ViewPager2 để tạo hiệu ứng xem vuốt giữa 2 fragments

Tham khảo từ nguồn: <https://developer.android.com/develop/ui/views/animations/screen-slide-2>

Yêu cầu:

- Mỗi 1 ViewPager2: Chứa nội dung đầy 1 màn hình, người dùng sẽ vuốt (swipe) từ trái sang phải để di chuyển tới trang tiếp theo, hoặc vuốt sang phải để lùi lại một trang.

Màn hình: ViewPager2 thứ nhất



Màn hình: ViewPager2 thứ hai



Hiệu ứng vuốt màn hình

