Programming with Android:
Animations, Menu, Toast and Dialogs

Luca Bedogni **Marco Di Felice**

Dipartimento di Informatica: Scienza e Ingegneria

Università di Bologna

Animations

- Make the components move/shrink/color
- Mainly two methods:
  - Subsequent images (frame-by-frame)
  - Initial state, final state, time, transition (tween)
- Animation are expensive in terms of memory
  - Be sure to manage them correctly

Animations: frame-by-frame

- Define a set of frame
  - Each Drawable is a frame of the animation
- Usage of AnimationDrawable
  - An Animation specialization
- Could be defined via XML or in Java

Animations: frame-by-frame, XML

```
<animation-list android:id="selected" android:oneshot="false">
        <item android:drawable="@drawable/anim0" android:duration="10" />
        <item android:drawable="@drawable/anim1" android:duration="10" />
        <item android:drawable="@drawable/anim2" android:duration="10" />
        <item android:drawable="@drawable/anim3" android:duration="10" />
        <item android:drawable="@drawable/anim4" android:duration="10" />
        <item android:drawable="@drawable/anim5" android:duration="10" />

</animation-list>
```

Animations: frame-by-frame, Java

```
public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);
        ImageView imageView = (ImageView) findViewById(R.id.animationView);
        animationDrawable = (AnimationDrawable) imageView.getBackground();
        btnStart = (Button)findViewById(R.id.btnStart);
        btnStop = (Button)findViewById(R.id.btnStop);
        btnStart.setOnClickListener(this);   btnStop.setOnClickListener(this);
}
public void onClick(View v) {
        if (v == btnStart) animationDrawable.start();
        else animationDrawable.stop();
}
```

Animations: frame-by-frame

- Not so easy to use
- If you want to change something in the middle of the animation, you may have to change the entire animation
- Coupled with a set of images
  - Same animation on different images?
    - → Define another animation
- You have to manually create every image
- The .apk will become larger

Animations: tween

- Define the skeleton of an animation
- Define the transitions in the form of ***"when it starts, it's like this, when it ends, it's like that, and it lasts x seconds"***
- One could define an animation and apply it to multiple objects, so animations are not coupled with objects
  - Reuse it!

Animations: tween

- Let's start by creating a TextView
- Create a *anim* directory under *res*
- Create a *animation.xml* file

```
<set
   xmlns:android="http://schemas.android.com/apk/res/android">
   <alpha
      android:fromAlpha="0.0"
      android:toAlpha="1.0"
      android:duration="1500"
       />
</set>
```

Tween: animation.xml

- Meanings:
  - fromAlpha: initial opacity. 0 is invisible,1 is visible.
  - toAlpha: final opacity. 0 is invisible, 1 is visible.
  - duration: the duration of the animation, in milliseconds.

Tween: Inside the code

- We need a function, like *startAnimation()* inside our activity
  - We need to get the TextView with *findViewById()*
  - Create the animation by calling it
  - Apply the animation to the TextView
- (Nearly) the same for *stopAnimation()*

Tween: Inside the code

```
public void startAnimation() {
    TextView title = (TextView)findViewById(R.id.title);
    Animation fade = AnimationUtils.loadAnimation(this, R.anim.animation);
    title.startAnimation(fade);
}

public void stopAnimation() {
    TextView title = (TextView)findViewById(R.id.title);
    title.clearAnimation();
}
```

Tween: adding an offset

- The offset if used if you want to start an animation after a certain amount of time
- Not so useful with animations composed by a single View
- Could be useful with 2 or more Views
  - Start an animation after x seconds of another animation

Tween: AnimationListener

- AnimationListener class, to be warned about animations events
- Attach it to your animation
- Implement the code in the listener
- Methods contained are:
  - onAnimationEnd()
  - onAnimationRepeat()
  - onAnimationStart()

Adding an offset and a listener

```
public void startAnimation() {
        TextView title = (TextView)findViewById(R.id.title);
        Animation fade = AnimationUtils.loadAnimation(this, R.anim.animation);
        fade.setAnimationListener(this);
        title.startAnimation(fade);

        TextView subtitle = (TextView)findViewById(R.id.subtitle);
        Animation fade2 = AnimationUtils.loadAnimation(this, R.anim.animation);
        fade2.setStartOffset(500);
        subtitle.startAnimation(fade2);
}
```

Tween: animations

- Of course there isn't only the alpha parameter to set
- One can edit the rotation of an object, the dimension of an image and the position on the screen
- Beware: animation are cool, but too many of them could confuse the user
- Use animations as a support for your application, not as a main purpose

Menu: outline

- They appear whenever the user presses the menu button
- Useful for giving different options without leaving the current Activity
- Don’t make too big menus, or they’ll cover entirely the Activity

Menu: creating a menu

- Two methods (again):
  - XML
    - Place a file inside res/menu/
    - Inflate the menu inside the Activity
    - Useful if you want to create the same menu inside different activities
  - Java
    - Create the menu directly inside the activity

Menu: the declarative approach

- Create res/menu/menu.xml
- We need:
  - IDs of menu's elements
  - Title of each element
  - Icon of each element
- Inside the Activity, create onCreateOptionsMenu()
  - Inflate the menu
  - Add functionality to the buttons

Menu: menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android" >
    <item android:id="@+id/item1" android:title="First Option"></item>
    <item android:id="@+id/item2" android:title="Second Option">
        <menu>
            <item android:id="@+id/item3" android:title="Third Option"/>
            <item android:id="@+id/item4" android:title="Fourth Option"/>
        </menu>
    </item>
</menu>
```

Menu: inflate the menu

```
public boolean onCreateOptionsMenu(Menu menu) {
    super.onCreateOptionsMenu(menu);

    getMenuInflater().inflate(R.menu.myMenu, menu);

    menu.findItem(R.id.menu_first).setIntent(new Intent(this, First.class));

    return true;
}
```

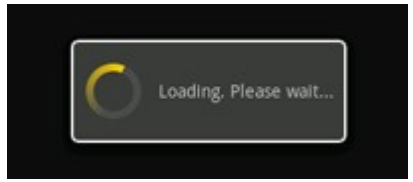
Toast: making a toast

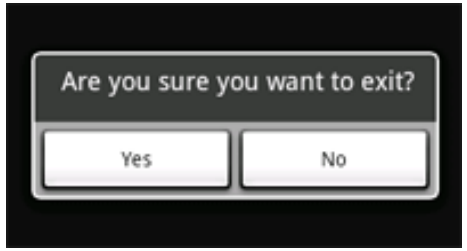
- Tiny messages over the Activity
- Used to signal to the user confirmation, little errors
- Can control the duration of the Toast
- As simple as:

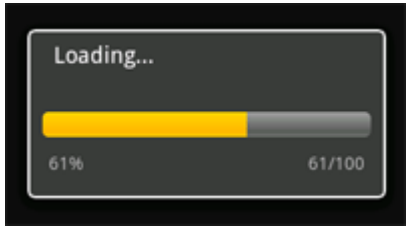
```
Toast msg = Toast.makeText(this, “Toast!”, Toast.LENGTH_SHORT).show();
```

Dialog: outline

- Used to interact with the user
- Little messages, easy answers
- Different kinds:
  - AlertDialog
  - ProgressDialog
  - DatePickerDialog
  - TimePickerDialog

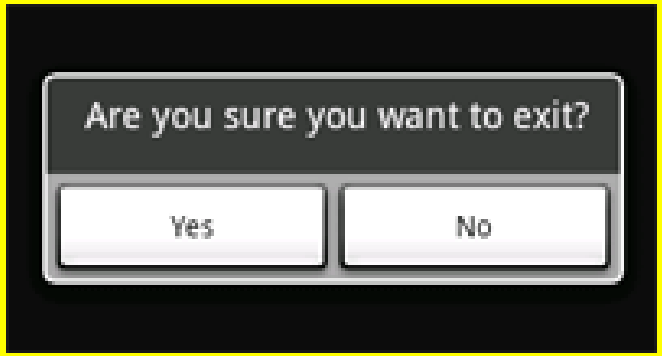






Dialog: AlertDialog

```
AlertDialog.Builder builder = new AlertDialog.Builder(this);
builder.setMessage("Are you sure you want to exit?").setCancelable(false);
builder.setPositiveButton("Yes", new DialogInterface.OnClickListener() {
      public void onClick(DialogInterface dialog, int id) {
                MenuExampleActivity.this.finish();
      }
});
builder.setNegativeButton("No", new DialogInterface.OnClickListener() {
      public void onClick(DialogInterface dialog, int id) {
            dialog.cancel();
      }
});
AlertDialog alert = builder.create();       alert.show();
```



Dialog: AlertDialog with a list

```
final CharSequence[] items = {"Red", "Green", "Blue"};
AlertDialog.Builder builder = new AlertDialog.Builder(this);

builder.setTitle("Pick a color");

builder.setItems(items, new DialogInterface.OnClickListener() {
    public void onClick(DialogInterface dialog, int item) {
        Toast.makeText(getApplicationContext(), items[item],
Toast.LENGTH_SHORT).show();
    }
});// OR

builder.setSingleChoiceItems(items, -1, new DialogInterface.OnClickListener() {
    public void onClick(DialogInterface dialog, int item) {
        Toast.makeText(getApplicationContext(), items[item],
            Toast.LENGTH_SHORT).show();
    }
});
AlertDialog alert = builder.create();
```