CS355

Mobile Application Development
การพัฒนาโปรแกรมประยุกต์สำหรับอุปกรณ์พกพา

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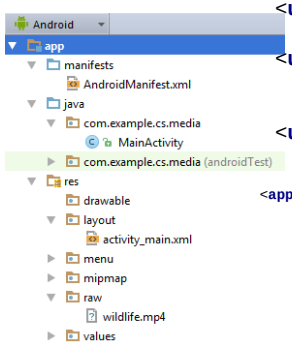
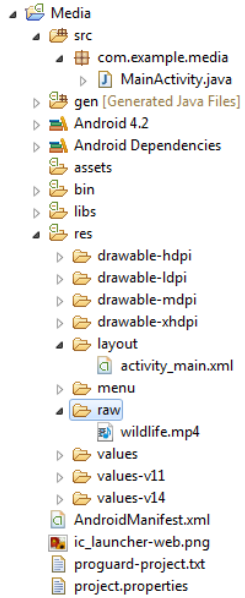
MA09: Audio, Video and Animation and
เสียง วิดีทัศน์ ภาพเคลื่อนไหว และ
Scheduler Examples
ตัวอย่างงานประเภท Scheduler

Audio and Video : AndroidManifest.xml



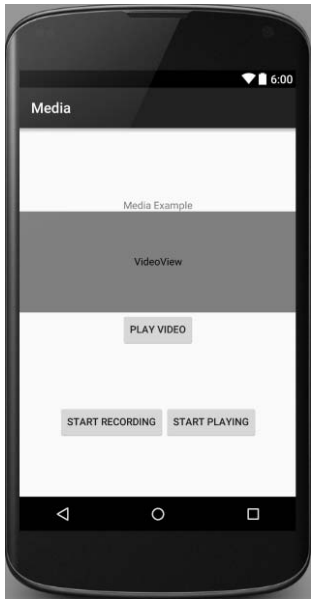

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.cs.media" >

    <uses-permission
        android:name="android.permission.WAKE_LOCK" />
    <uses-permission
        android:name="android.permission.WRITE_EXTERNAL
                    _STORAGE"/>
    <uses-permission
        android:name="android.permission.RECORD_AUDIO"/>

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name=".MainActivity"
            android:label="@string/app_name" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```


Audio and Video : Import Media File into "res/raw"



- ข้อจำกัด
  - ชื่อไฟล์ต้องตั้งด้วยตัวพิมพ์เล็กทั้งหมด
  - Case insensitive
- อ่านไฟล์ภาพ
  - JPEG (.jpg)
  - GIF (.gif)
  - PNG (.png)
  - BMP (.bmp)
  - WebP (.webp)
- อ่านไฟล์เสียง
  - 3GPP (.3gp)
  - MPEG-4 (.mp4, .m4a)
  - AAC (.aac)
  - MP3 (.mp3)
  - RTTTL/RTX (.rtttl, .rtx)
  - OTA (.ota)
  - iMelody (.imy)
  - WAVE (.wav)
  - Ogg (.ogg)
  - Matroska (.mkv, Android 4.0+)
- อ่านไฟล์ Video
  - 3GPP (.3gp)
  - MPEG-4 (.mp4)
  - WebM (.webm)
  - Matroska (.mkv, Android 4.0+)

Audio and Video : Layout (activity_main.xml)




```xml
<LinearLayout android:orientation="vertical"
        android:gravity="center" >
    <TextView
        android:id="@+id/textView"
        android:text="@string/msg" />
    <VideoView
        android:id="@+id/videoView“ />
    <Button
        android:id="@+id/button1"
        android:text="@string/play_video" />

    <LinearLayout
        android:id="@+id/linearLayout1"
        android:orientation="horizontal" >
        <Button
            android:id="@+id/button2"
       android:text="@string/start_record"/>
        <Button
            android:id="@+id/button3"
      android:text="@string/start_play" />
    </LinearLayout>
</LinearLayout>
```

Audio and Video : Code (MainActivity.java)

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

    Button button1 = (Button) findViewById(R.id.button1);
    button1.setOnClickListener(new View.OnClickListener() {
        public void onClick(View v) {
            showVideoView();
        }
    });

    final Button button2 = (Button) findViewById(R.id.button2);
    button2.setText("Start recording");
    button2.setOnClickListener(new View.OnClickListener() {
        public void onClick(View v) {
            onRecord(mStartRecording);
            if (mStartRecording) {
                button2.setText("Stop recording");
            } else {
                button2.setText("Start recording");
            }
            mStartRecording = !mStartRecording;
        }
    });

    final Button button3 = (Button) findViewById(R.id.button3);
    button3.setText("Start playing");
    button3.setOnClickListener(new View.OnClickListener() {
        public void onClick(View v) {
            onPlay(mStartPlaying);
            if (mStartPlaying) {
                button3.setText("Stop playing");
            } else {
                button3.setText("Start playing");
            }
            mStartPlaying = !mStartPlaying;
        }
    });
}
```


Video : MainActivity.java

```
public void showVideoView(){
 VideoView videoview = (VideoView)findViewById(R.id.videoView);
    Uri uri = Uri.parse("android.resource://"+
                        getPackageName()+"/"+R.raw.wildlife );
    videoview.setMediaController(new MediaController(this));
    videoview.setVideoURI(uri);
    videoview.requestFocus();
    videoview.start();
}
```


Record Audio : MainActivity.java (1/2)

```
final Button button2 = (Button) findViewById(R.id.button2);
button2.setText("Start recording");
button2.setOnClickListener(new View.OnClickListener() {
    public void onClick(View v) {
        onRecord(mStartRecording);
        if (mStartRecording) {
            button2.setText("Stop recording");
        } else {
            button2.setText("Start recording");
        }
        mStartRecording = !mStartRecording;
    }
});
```

```
private void onRecord(boolean start) {
    if (start) {
        startRecording();
    } else {
        stopRecording();
    }
}
```

```
public MainActivity() {
    mFileName = Environment.getExternalStorageDirectory().getAbsolutePath();
    mFileName += "/audiorecordtest.3gp";
}
```


Record Audio : MainActivity.java (2/2)

```
public MainActivity() {
    mFileName = Environment.getExternalStorageDirectory().getAbsolutePath();
    mFileName += "/audiorecordtest.3gp";
}
private void startRecording() {
    mRecorder = new MediaRecorder();
    mRecorder.setAudioSource(MediaRecorder.AudioSource.MIC);
    mRecorder.setOutputFormat(MediaRecorder.OutputFormat.THREE_GPP);
    mRecorder.setOutputFile(mFileName);
    mRecorder.setAudioEncoder(MediaRecorder.AudioEncoder.AMR_NB);

    try {
        mRecorder.prepare();
    } catch (IOException e) {
        Log.e(LOG_TAG, "prepare() failed");
    }

    mRecorder.start();
}

private void stopRecording() {
    mRecorder.stop();
    mRecorder.release();
    mRecorder = null;
}
```

Play & Stop Audio : MainActivity.java (1/2)

```
final Button button3 = (Button) findViewById(R.id.button3);
button3.setText("Start playing");
button3.setOnClickListener(new View.OnClickListener() {
    public void onClick(View v) {
        onPlay(mStartPlaying);
        if (mStartPlaying) {
            button3.setText("Stop playing");
        } else {
            button3.setText("Start playing");
        }
        mStartPlaying = !mStartPlaying;
    }
});
```

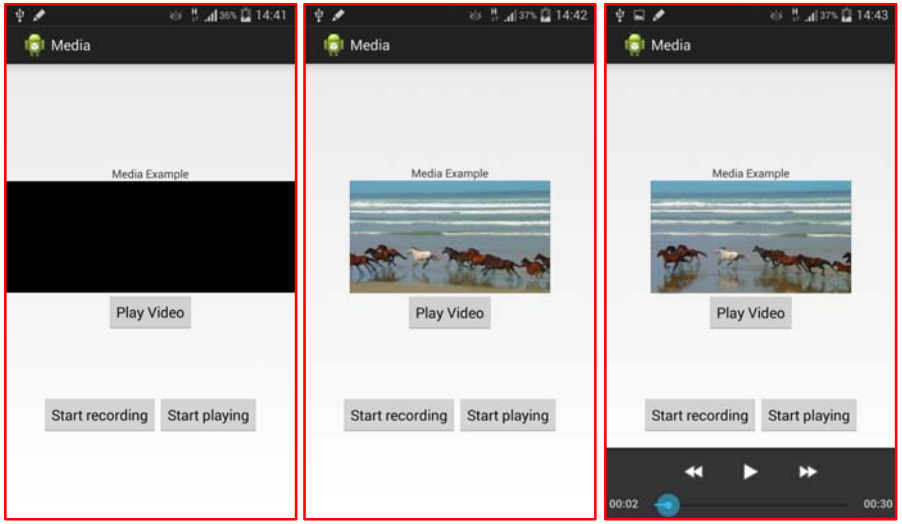
```
private void onPlay(boolean start) {
    if (start) {
        startPlaying();
    } else {
        stopPlaying();
    }
}
```

```
public MainActivity() {
    mFileName = Environment.getExternalStorageDirectory().getAbsolutePath();
    mFileName += "/audiorecordtest.3gp";
}
```

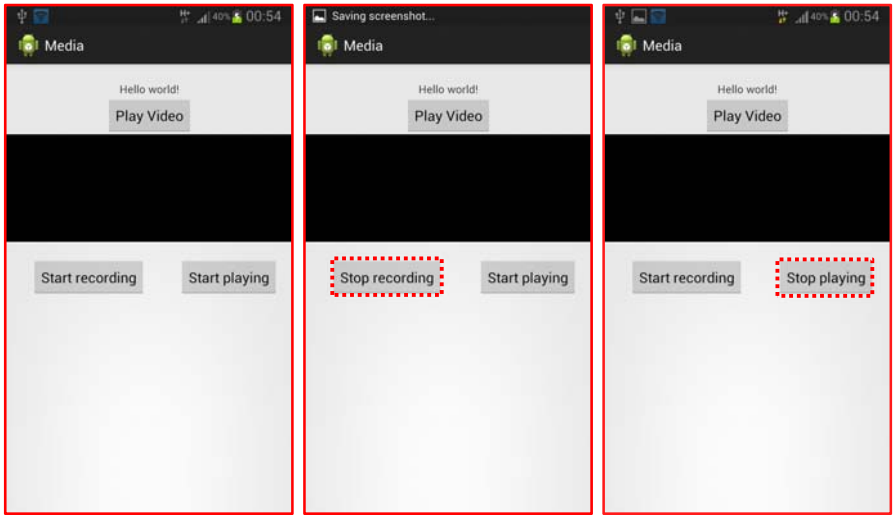

Play & Stop Audio : MainActivity.java (2/2)

```
public MainActivity() {
    mFileName = Environment.getExternalStorageDirectory().getAbsolutePath();
    mFileName += "/audiorecordtest.3gp";
}

        private void startPlaying() {
            mPlayer = new MediaPlayer();
            try {
                mPlayer.setDataSource(mFileName);
                mPlayer.prepare();
                mPlayer.start();
            } catch (IOException e) {
                Log.e(LOG_TAG, "prepare() failed");
            }
        }

        private void stopPlaying() {
            mPlayer.release();
            mPlayer = null;
        }
```

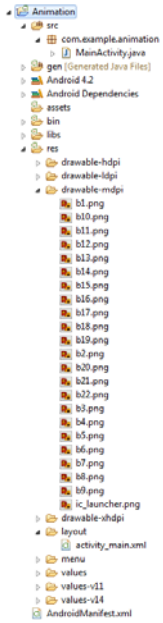

Run on Device : Video



Run on Device : Audio



Animation



- Import Images into "res/drawable"

Animation : Layout (activity_main.xml)


```
<LinearLayout android:orientation="vertical">

    <LinearLayout
        android:orientation="horizontal" >
        <Button
            android:id="@+id/strtbtn"
            android:text="@string/start" />
        <Button
            android:id="@+id/stpbtn"
            android:text="@string/stop" />
    </LinearLayout>

    <ImageView
        android:id="@+id/img"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
    android:contentDescription ="@string/img"/>

</LinearLayout>
```


Animation : MainActivity.java → onCreate()

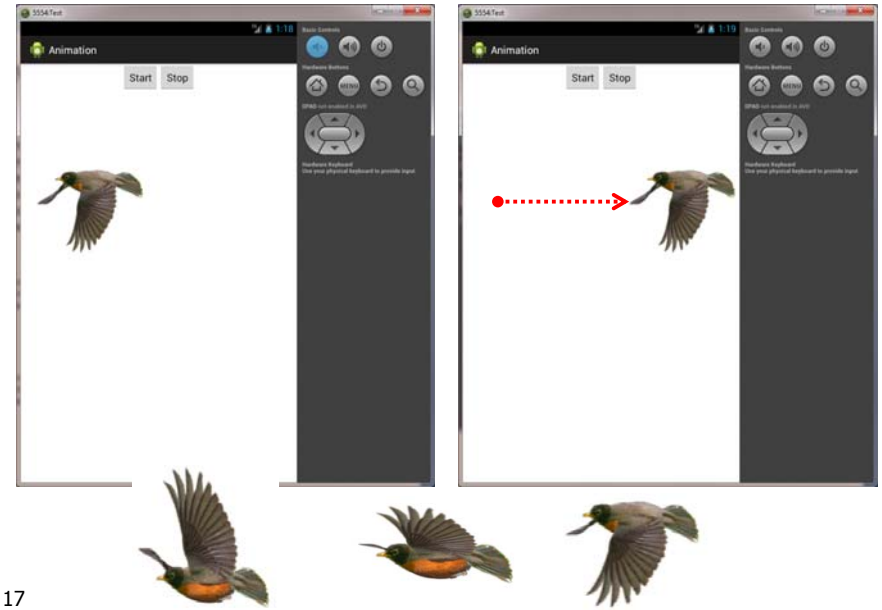
```
public class MainActivity extends AppCompatActivity {

    AnimationDrawable mAnimation;
    ImageView img;
    int x=0,y=0;

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

        img = (ImageView) findViewById(R.id.img);
        BitmapDrawable[] frame = new BitmapDrawable[23];
        int i=0;

        for(i=1; i<=22; i++){
            frame[i] = (BitmapDrawable)getResources().getDrawable(
                    getResources().getIdentifier((String)"b"+i, "drawable", this.getPackageName()) );
        }

        int reasonableDuration = 200;
        mAnimation = new AnimationDrawable();
        for(i=1; i<=22; i++){
            mAnimation.addFrame(frame[i], reasonableDuration);
        }

        img.setImageDrawable(mAnimation);
```


Animation : MainActivity.java → onCreate()
Image Translation

```
TranslateAnimation tAnimation = new TranslateAnimation(0, 260, 0, 0);
tAnimation.setDuration(5000);
tAnimation.setFillAfter(true);
tAnimation.setRepeatCount(Animation.INFINITE);
tAnimation.setRepeatMode(Animation.REVERSE);
img.setAnimation(tAnimation);
```

```
        final Button strtbtn = (Button) findViewById(R.id.strtbtn);
        strtbtn.setOnClickListener(new View.OnClickListener() {
                public void onClick(View v) {
                    mAnimation.start();
                    mAnimation.setOneShot(false);
                }
            });

        final Button stpbtn = (Button) findViewById(R.id.stpbtn);
        stpbtn.setOnClickListener(new View.OnClickListener() {
                public void onClick(View v) {
                    mAnimation.stop();
                }
            });
    }
```

Translates Image from Left to Right

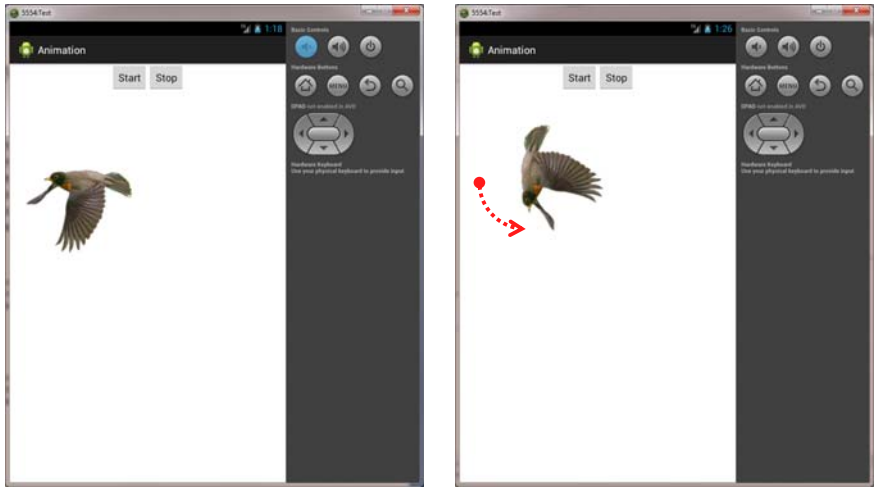


Animation : MainActivity.java → onCreate()
Image Rotation

```
RotateAnimation rAnim = new RotateAnimation(0f, -180f,
                            RotateAnimation.RELATIVE_TO_SELF, 0.5f,
                            RotateAnimation.RELATIVE_TO_SELF, 0.5f);
rAnim.setStartOffset(0);
rAnim.setDuration(10000);
rAnim.setFillAfter(true);
rAnim.setRepeatCount(Animation.INFINITE);
rAnim.setRepeatMode(Animation.RESTART);
img.setAnimation(rAnim);
```

```
        final Button strtbtn = (Button) findViewById(R.id.strtbtn);
        strtbtn.setOnClickListener(new View.OnClickListener() {
                public void onClick(View v) {
                    mAnimation.start();
                    mAnimation.setOneShot(false);
                }
            });

        final Button stpbtn = (Button) findViewById(R.id.stpbtn);
        stpbtn.setOnClickListener(new View.OnClickListener() {
                public void onClick(View v) {
                    mAnimation.stop();
                }
            });
    }
```


Rotates Image Counter Clockwise

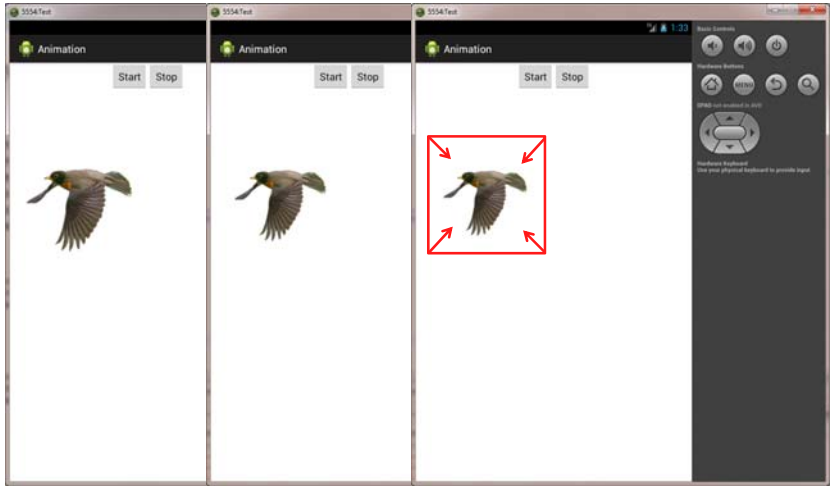


Animation : MainActivity.java → onCreate()
Image Scale

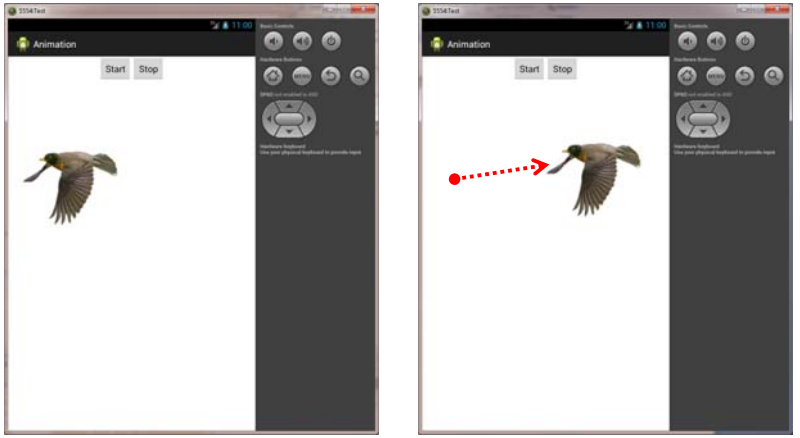
```
ScaleAnimation sAnimation = new ScaleAnimation(1f, 0.5f, 1f, 0.5f,
          Animation.RELATIVE_TO_SELF, 0.5f, Animation.RELATIVE_TO_SELF, 0.5f);
sAnimation.setDuration(10000);
sAnimation.setFillAfter(true);
sAnimation.setRepeatCount(Animation.INFINITE);
sAnimation.setRepeatMode(Animation.RESTART);
img.setAnimation(sAnimation);
```

```
        final Button strtbtn = (Button) findViewById(R.id.strtbtn);
        strtbtn.setOnClickListener(new View.OnClickListener() {
                public void onClick(View v) {
                    mAnimation.start();
                    mAnimation.setOneShot(false);
                }
            });

        final Button stpbtn = (Button) findViewById(R.id.stpbtn);
        stpbtn.setOnClickListener(new View.OnClickListener() {
                public void onClick(View v) {
                    mAnimation.stop();
                }
            });
    }
```

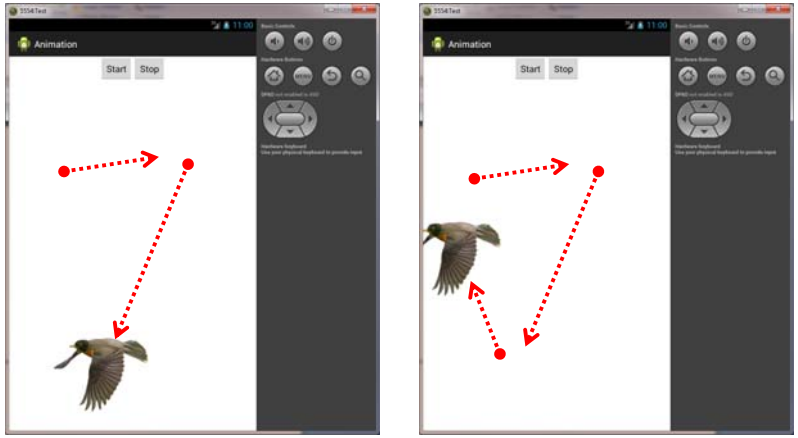
Scales Image : Zoom In / Zoom Out



Move to the Touch Point : Keep Current Position (1/3)



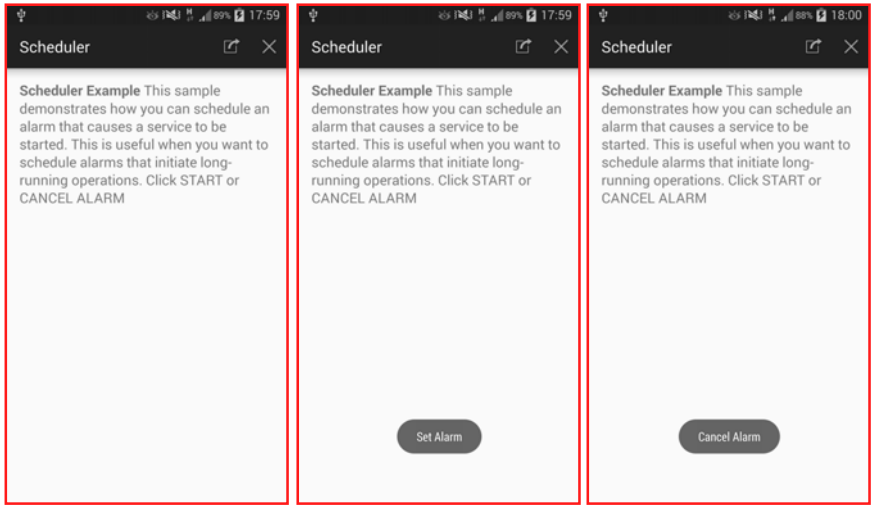
Move to the Touch Point : Keep Current Position (2/3)



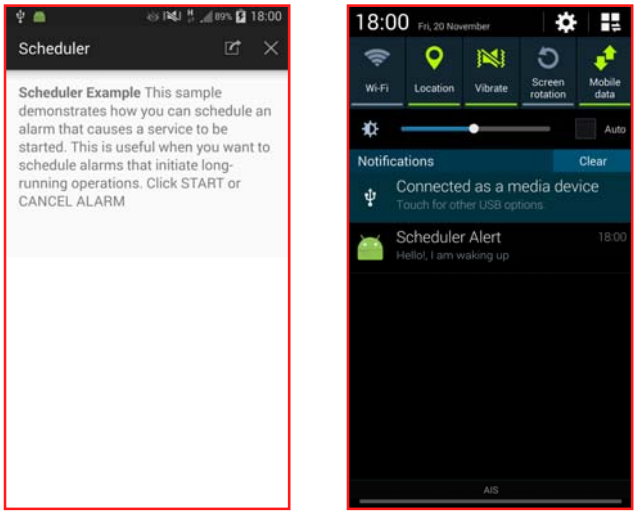
Move to the Touch Point : Keep Current Position (3/3)

```
public boolean onTouchEvent(MotionEvent event) {
    if (event.getAction() == MotionEvent.ACTION_DOWN) {
        TranslateAnimation tAnimation =
                new TranslateAnimation(x, ((int)event.getX()-(w/2)),
                                       y, ((int)event.getY()-h));
        x = (int)event.getX()-(w/2);
        y = (int)event.getY()-h;
        tAnimation.setDuration(1000);
        tAnimation.setFillAfter(true);
        tAnimation.setRepeatCount(0);
        tAnimation.setRepeatMode(Animation.RESTART);
        img.startAnimation(tAnimation);
        return true;
    }
    return super.onTouchEvent(event);
}
```

Scheduler



Scheduler : Alert




```
<uses-permission android:name="android.permission.WAKE_LOCK" />
<uses-permission android:name="android.permission.DISABLE_KEYGUARD" />
<uses-permission android:name="android.permission.RECEIVE_BOOT_COMPLETED" />
```


Scheduler : MainActivity.java

```
public class MainActivity extends AppCompatActivity {
    SampleAlarmReceiver alarm = new SampleAlarmReceiver();

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

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.menu_main, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
            case R.id.start_action:
                alarm.setAlarm(this);
                return true;
            case R.id.cancel_action:
                alarm.cancelAlarm(this);
                return true;
        }
        return false;
    }
}
```


Scheduler : SampleAlarmReceiver.java (1/3)

```
public class SampleAlarmReceiver extends WakefulBroadcastReceiver {
    private AlarmManager alarmMgr;
    private PendingIntent alarmIntent;
    @Override
    public void onReceive(Context context, Intent intent) {
        Intent service = new Intent(context, SampleSchedulingService.class);
        startWakefulService(context, service);
    }
    public void setAlarm(Context context) {
        alarmMgr = (AlarmManager)context.getSystemService(Context.ALARM_SERVICE);
        Intent intent = new Intent(context, SampleAlarmReceiver.class);
        alarmIntent = PendingIntent.getBroadcast(context, 0, intent, 0);
        // (1) Wake up the device to fire a one-time alarm in one minute.
        /*
        alarmMgr.set(AlarmManager.ELAPSED_REALTIME_WAKEUP,
                    SystemClock.elapsedRealtime() + 60*1000, alarmIntent);
        */
        alarmMgr.set(AlarmManager.ELAPSED_REALTIME_WAKEUP,
                    SystemClock.elapsedRealtime() + 10 * 1000, alarmIntent);

        // (2) Wake up the device to fire the alarm in 30 minutes,
                                        and every 30 minutes after that.
        /*
        alarmMgr.setInexactRepeating(AlarmManager.ELAPSED_REALTIME_WAKEUP,
                                    AlarmManager.INTERVAL_HALF_HOUR,
                                    AlarmManager.INTERVAL_HALF_HOUR, alarmIntent);
        */
```

Scheduler : SampleAlarmReceiver.java (2/3)

```
        // (3) Set the alarm to fire at approximately 8:30 a.m.,
                    according to the device's clock, and to repeat once a day.
        /*
        Calendar calendar = Calendar.getInstance();
        calendar.setTimeInMillis(System.currentTimeMillis());
        // Set the alarm's trigger time to 8:30 a.m.
        calendar.set(Calendar.HOUR_OF_DAY, 8);
        calendar.set(Calendar.MINUTE, 30);
        alarmMgr.setInexactRepeating(AlarmManager.RTC_WAKEUP,
                                     calendar.getTimeInMillis(),
                                    AlarmManager.INTERVAL_DAY, alarmIntent);
        */
        Toast.makeText(context, "Set Alarm", Toast.LENGTH_LONG).show();

        ComponentName receiver = new ComponentName(context,
                                                   SampleBootReceiver.class);
        PackageManager pm = context.getPackageManager();
        pm.setComponentEnabledSetting(receiver,
                                  PackageManager.COMPONENT_ENABLED_STATE_ENABLED,
                                  PackageManager.DONT_KILL_APP);
    }
```


Scheduler : SampleAlarmReceiver.java (3/3)

```
    public void cancelAlarm(Context context) {
        if (alarmMgr!= null) {
            alarmMgr.cancel(alarmIntent);
        }
        Toast.makeText(context, "Cancel Alarm", Toast.LENGTH_LONG).show();

        ComponentName receiver = new ComponentName(context,
                                                   SampleBootReceiver.class);
        PackageManager pm = context.getPackageManager();
        pm.setComponentEnabledSetting(receiver,
                                  PackageManager.COMPONENT_ENABLED_STATE_DISABLED,
                                  PackageManager.DONT_KILL_APP);
    }
```


Scheduler : SampleSchedulingService .java (1)

```
public class SampleSchedulingService extends IntentService {
    …
    @Override
    protected void onHandleIntent(Intent intent) {
        sendNotification(getString(R.string.msg));
        SampleAlarmReceiver.completeWakefulIntent(intent);
    }

    private void sendNotification(String msg) {
        mNotificationManager = (NotificationManager)
                               this.getSystemService(Context.NOTIFICATION_SERVICE);
        PendingIntent contentIntent = PendingIntent.getActivity(this, 0,
                                      new Intent(this, MainActivity.class), 0);
        NotificationCompat.Builder mBuilder =
            new NotificationCompat.Builder(this).setSmallIcon(R.mipmap.ic_launcher)
                                .setContentTitle(getString(R.string.header))
                                .setStyle(new NotificationCompat.BigTextStyle()
                                .bigText(msg))
                                .setContentText(msg);
        mBuilder.setContentIntent(contentIntent);
        mNotificationManager.notify(NOTIFICATION_ID, mBuilder.build());
```


Scheduler : SampleSchedulingService .java (2)

```
        KeyguardManager keyguardManager = (KeyguardManager)
                getApplicationContext().getSystemService(Context.KEYGUARD_SERVICE);
        KeyguardManager.KeyguardLock keyguardLock =
                                        keyguardManager.newKeyguardLock("Scheduler");
        keyguardLock.disableKeyguard();

        PowerManager pm = (PowerManager)
                    getApplicationContext().getSystemService(Context.POWER_SERVICE);
        PowerManager.WakeLock wakeLock =
                        pm.newWakeLock(( PowerManager.SCREEN_BRIGHT_WAKE_LOCK |
                                         PowerManager.FULL_WAKE_LOCK |
                                         PowerManager.ACQUIRE_CAUSES_WAKEUP),
                                         "Scheduler");
        wakeLock.acquire();
    }
}
```

References

- http://developer.android.com
- http://www.androidsnippets.com/play-video-file-from-resources
- http://developer.android.com/reference/android/graphics/drawable/AnimationDrawable.html
- http://thenewboston.org/list.php?cat=6
- http://developer.android.com/reference/android/view/animation/Animation.html
- http://developer.android.com/reference/android/view/animation/TranslateAnimation.html
- http://developer.android.com/reference/android/view/animation/RotateAnimation.html
- http://developer.android.com/reference/android/view/animation/ScaleAnimation.html
- Bird Image from KadrmasConcepts Blog
  http://www.kadrmasconcepts.com/blog/2011/05/20/sprite-sheets-return-of-the-animated-gif/
- http://developer.android.com/guide/topics/media/mediaplayer.html
- Scheduler example
  http://developer.android.com/training/scheduling/alarms.html