군산대학교
KUNSAN NATIONAL UNIVERSITY

User Interface

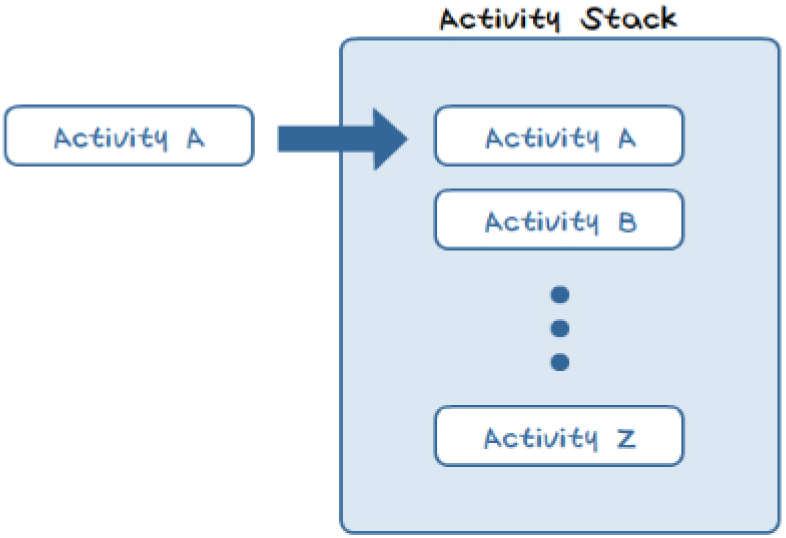
모바일 응용

남 광 우

주요 강의자료 인용 : 알짜만 골라배우는, 시작하세요 안드로이드,Professional Android

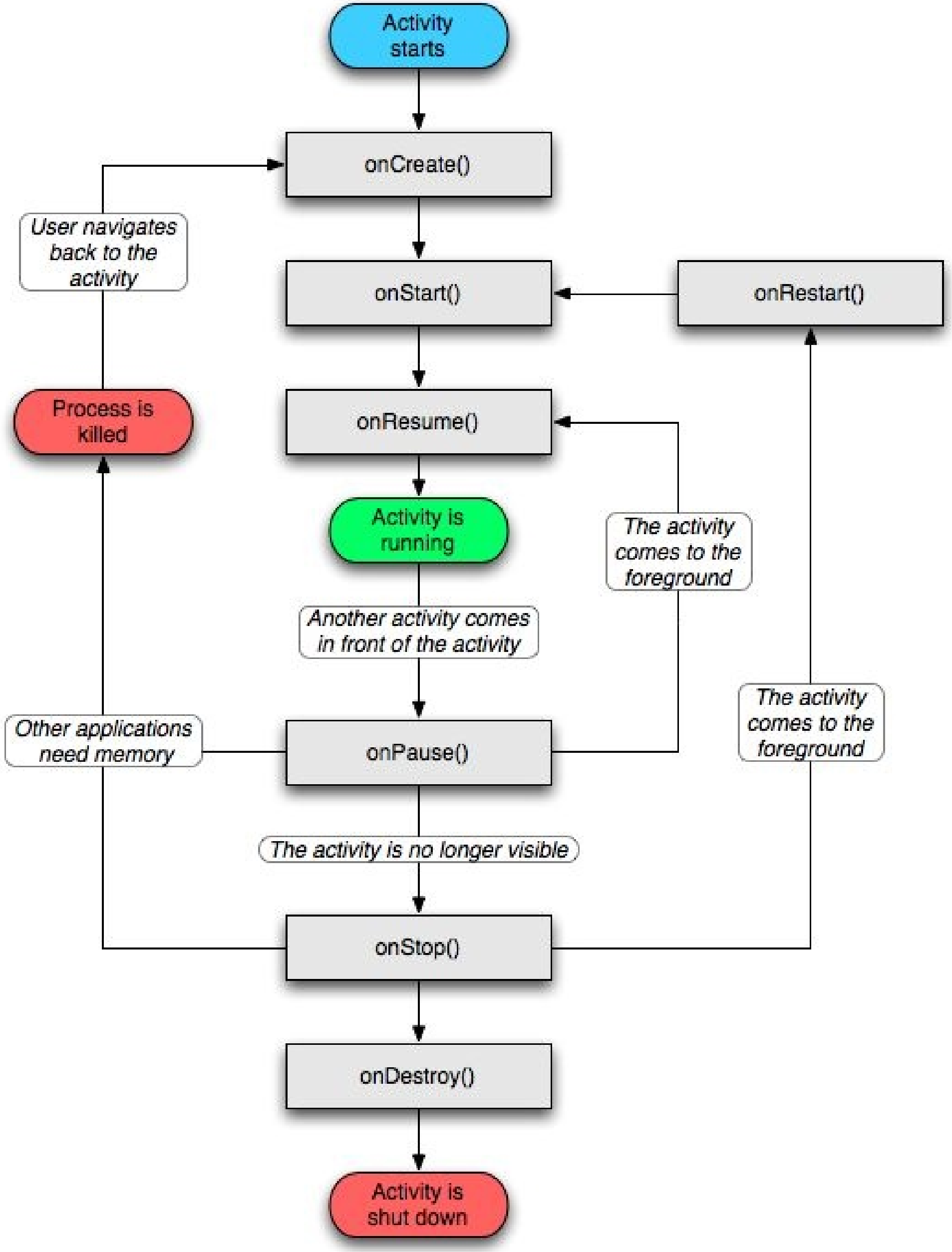
Activity

❖ Activity Stack



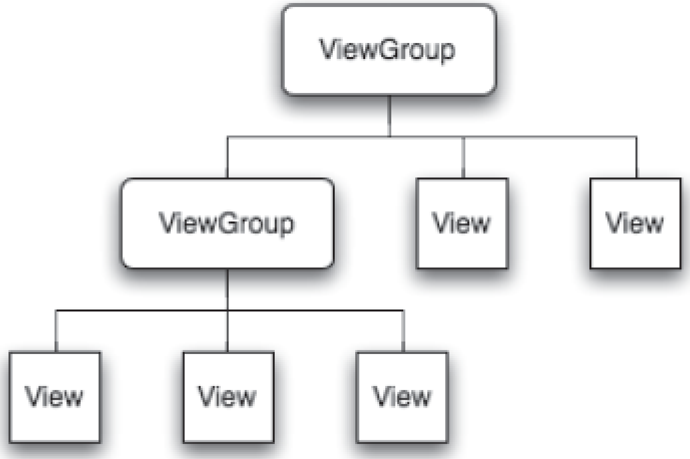
Activity

❖ Activity Lifecycle


Activity starts
onCreate()
User navigates back to the activity
onStart()
onRestart()
Process is killed
onResume()
Activity is running
The activity comes to the foreground
Another activity comes in front of the activity
The activity comes to the foreground
Other applications need memory
onPause()
The activity is no longer visible
onStop()
onDestroy()
Activity is shut down

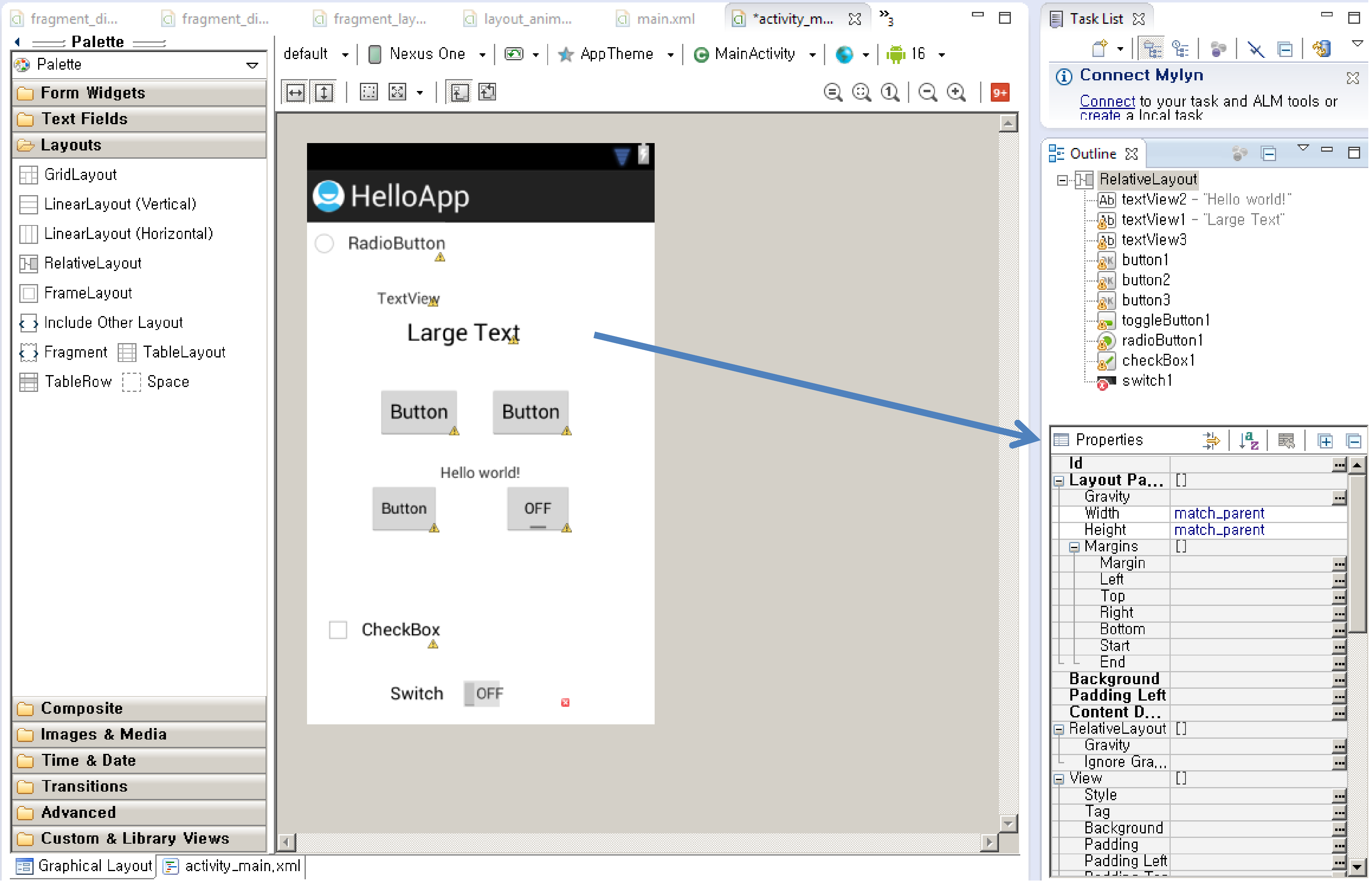
사용자 인터페이스

❖ 뷰 계층 구층구조



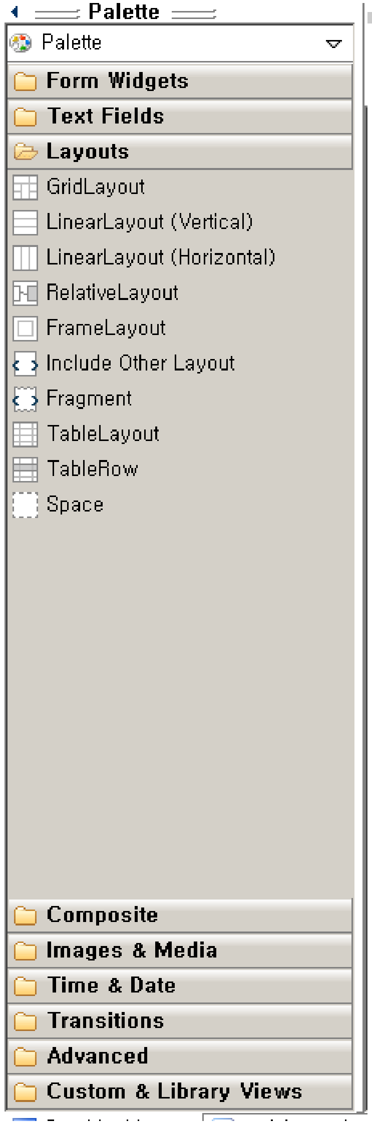
ViewGroup : Layout, ScrollView…

View : Button,…



Id	
Layout Pa...	[]
Gravity	
Width	match_parent
Height	match_parent
Margins	[]
Margin	
Left	
Top	
Right	
Bottom	
Start	
End	
Background	
Padding Left	
Content D...	
RelativeLayout	[]
Gravity	
Ignore Gra...	
View	[]
Style	
Tag	
Background	
Padding	
Padding Left	

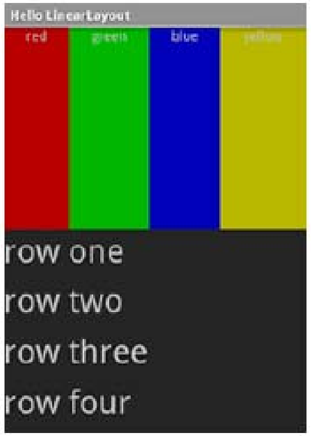
Layout

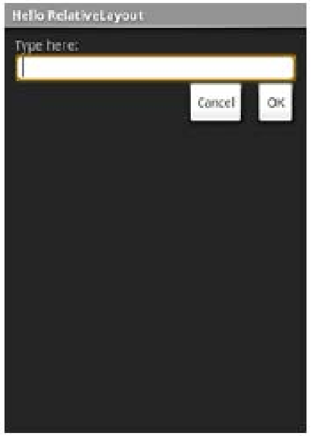


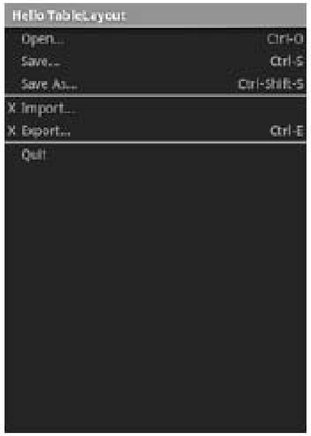
LinearLayout

RelativeLayout

TableLayout

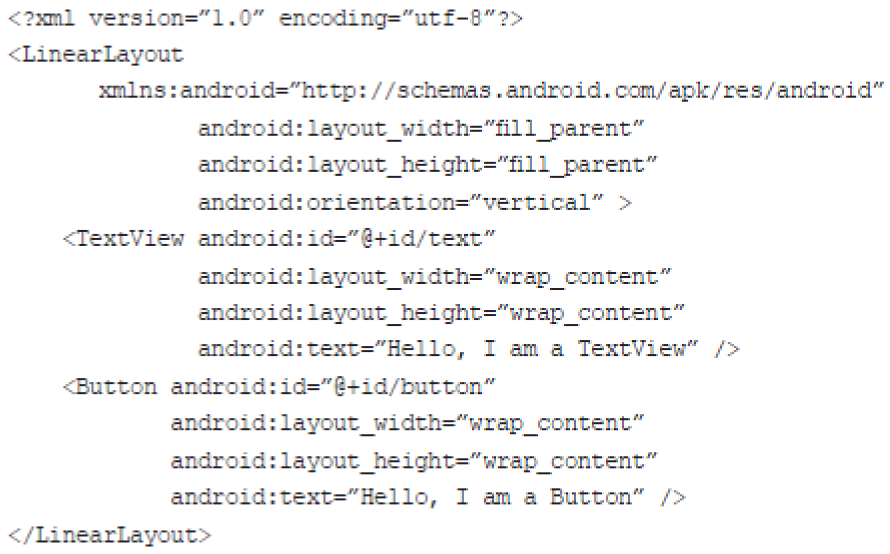






주요참조 : http://blog.naver.com/prologue/

❖ Linear Layout in XML



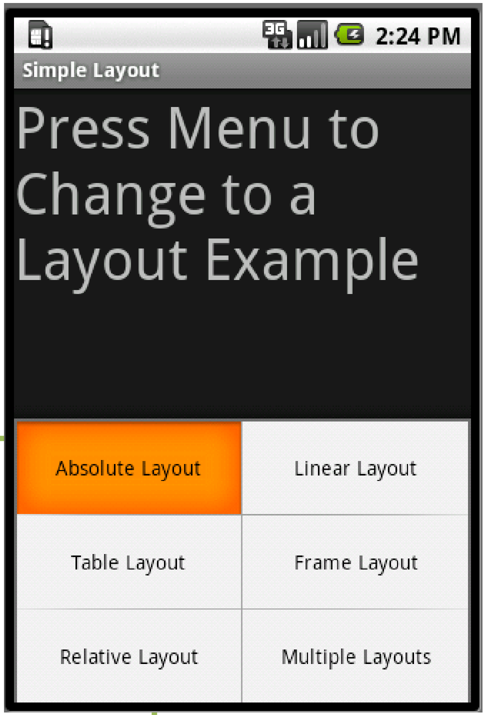
```
<?xml version=”1.0” encoding=”utf-8”?>
<LinearLayout
       xmlns:android=”http://schemas.android.com/apk/res/android”
              android:layout_width=”fill_parent”
              android:layout_height=”fill_parent”
              android:orientation=”vertical” >
    <TextView android:id=”@+id/text”
              android:layout_width=”wrap_content”
              android:layout_height=”wrap_content”
              android:text=”Hello, I am a TextView” />
    <Button android:id=”@+id/button”
            android:layout_width=”wrap_content”
            android:layout_height=”wrap_content”
            android:text=”Hello, I am a Button” />
</LinearLayout>
```

Layout

❖ Layout의 종류와 개념

- ✓ AbsoluteLayout(1.5이후 폐기)
- ✓ FrameLayout
- ✓ LinearLayout
- ✓ TableLayout
- ✓ RelativeLayout

```
public abstract class layout_menu_class extends Activity {

@Override
public boolean onCreateOptionsMenu(Menu menu) {
// TODO Auto-generated method stub
getMenuInflater().inflate(R.menu.layout_menu, menu);

menu.findItem(R.id.absolute_menu_item).setIntent(new Intent(this, absolute_layout.class));
menu.findItem(R.id.frame_menu_item).setIntent(new Intent(this, frame_layout.class));
menu.findItem(R.id.relative_menu_item).setIntent(new Intent(this, relative_layout.class));
menu.findItem(R.id.linear_menu_item).setIntent(new Intent(this, linear_layout.class));
menu.findItem(R.id.table_menu_item).setIntent(new Intent(this, table_layout.class));
menu.findItem(R.id.multi_menu_item).setIntent(new Intent(this, multiple_layout.class));

super.onCreateOptionsMenu(menu);
return true;
}
```



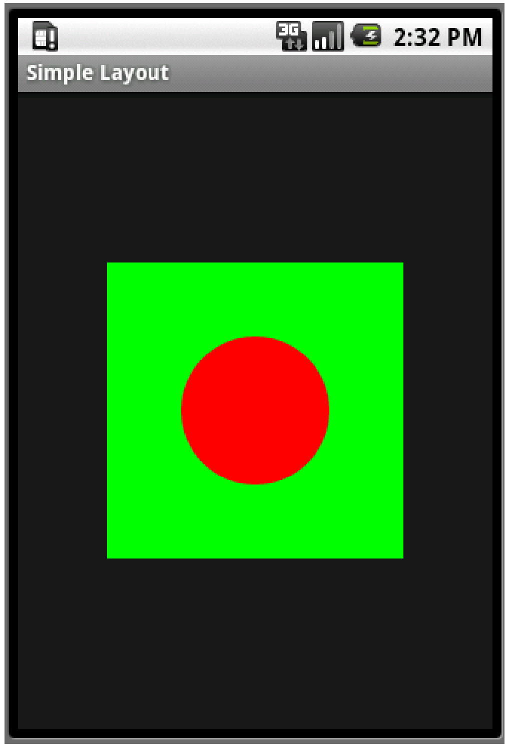
Press Menu to Change to a Layout Example

Layout : FrameLayout

❖ 정의

✓ 여러 자식 뷰들을 겹쳐서 그리고자 할 때 사용하는 Layout

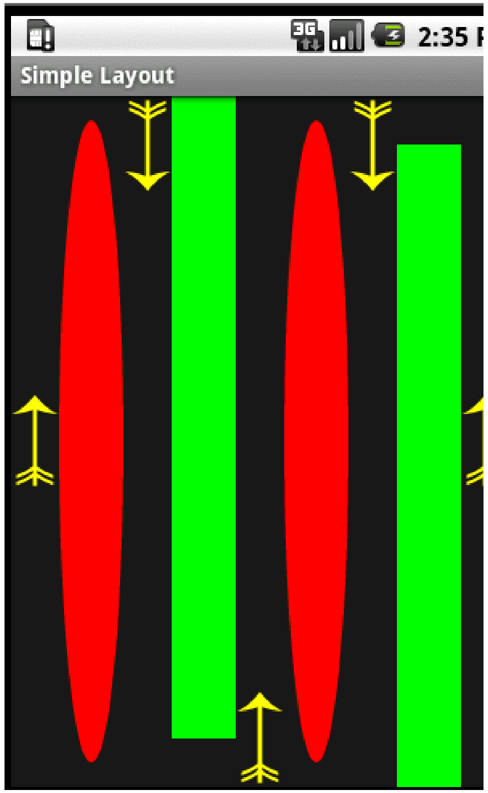
```
<FrameLayout
                android:id="@+id/FrameLayout01"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                xmlns:android="http://schemas.android.com/apk/res/android"
                android:layout_gravity="center">

                <ImageView
                                android:id="@+id/ImageView01"
                                android:layout_width="wrap_content"
                                android:layout_height="wrap_content"
                                android:src="@drawable/green_rect"
                                android:minHeight="200px"
                                android:minWidth="200px"></ImageView>

                <ImageView
                                android:id="@+id/ImageView02"
                                android:layout_width="wrap_content"
                                android:layout_height="wrap_content"
                                android:src="@drawable/red_oval"
                                android:minHeight="100px"
                                android:minWidth="100px"
                                android:layout_gravity="center"></ImageView>
</FrameLayout>
```



```
public class frame_layout extends layout_menu_class {

@Override
        protected void onCreate(Bundle savedInstanceState) {
        // TODO Auto-generated method stub
        super.onCreate(savedInstanceState);
        setContentView(R.layout.frame_layout);
        }

}
```

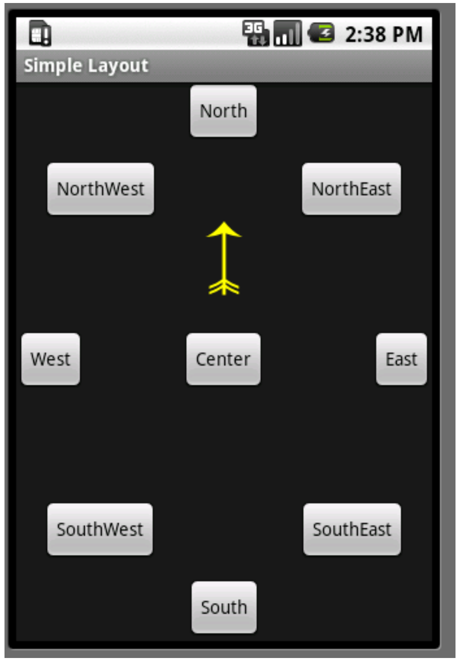
Layout : LinearLayout

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:orientation="horizontal" android:layout_gravity="center_vertical">
    <ImageView
        android:id="@+id/ImageView03"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/arrow" android:layout_gravity="center">
    </ImageView>
    <ImageView
        android:id="@+id/ImageView02"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/red_oval"
        android:minWidth="40px" android:minHeight="400px"
android:layout_gravity="center_vertical">
    </ImageView>
…
```



Layout : RelativeLayout

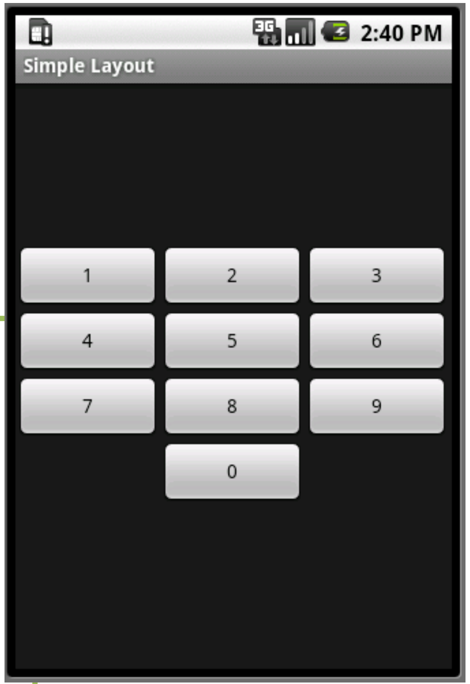
```
<RelativeLayout
    android:id="@+id/RelativeLayout01"
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_height="fill_parent"
    android:layout_width="fill_parent">
    <Button
        android:id="@+id/ButtonNorth"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="North"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"></Button>
    <Button
        android:id="@+id/ButtonNorthEast"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="NorthEast"
        android:layout_marginRight="20px"
        android:layout_marginTop="60px"
        android:layout_alignParentRight="true"></Button>
        <ImageView
        android:id="@+id/ImageView01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_above="@id/ButtonCenter"
            android:layout_centerHorizontal="true"
        android:layout_marginBottom="25px"
        android:src="@drawable/arrow"></ImageView>
```



Layout : TableLayout

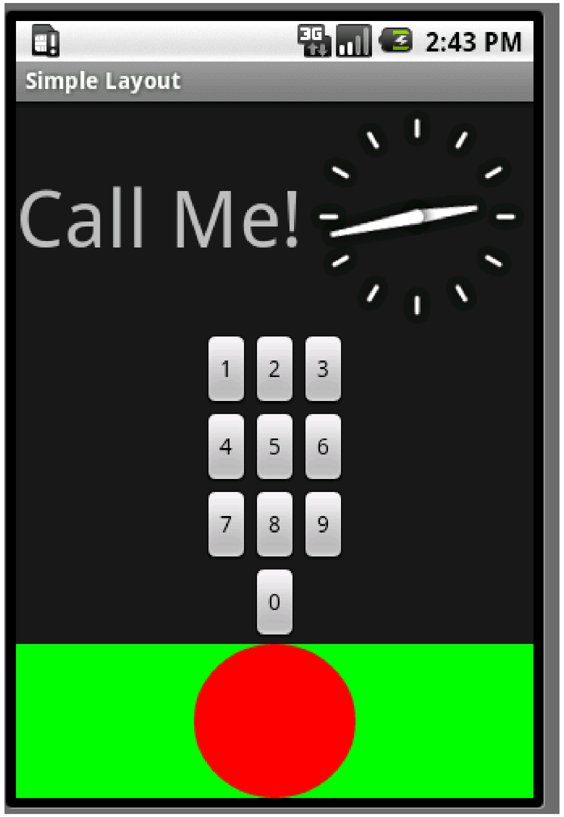
```
<TableLayout
    android:id="@+id/TableLayout01"
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:stretchColumns="*" android:gravity="center_vertical">
    <TableRow
        android:id="@+id/TableRow01"
        android:layout_width="fill_parent"
        android:layout_height="fill_parent">
        <Button
            android:id="@+id/Button01"
            android:text="1"></Button>
        <Button
            android:id="@+id/Button02"
            android:text="2"></Button>
        <Button
            android:id="@+id/Button03"
            android:text="3"></Button>
    </TableRow>
    <TableRow
        android:id="@+id/TableRow02"
        android:layout_height="wrap_content"
        android:layout_width="fill_parent">
        <Button
            android:id="@+id/Button04"
            android:text="4"></Button>
        <Button
            android:id="@+id/Button05"
            android:text="5"></Button>
        <Button
            android:id="@+id/Button06"
            android:text="6"></Button>
    </TableRow>
```

```
    <TableRow
        android:id="@+id/TableRow02"
        android:layout_height="wrap_content"
        android:layout_width="fill_parent">
        <Button
            android:id="@+id/Button07"
            android:text="7"></Button>
        <Button
            android:id="@+id/Button08"
            android:text="8"></Button>
        <Button
            android:id="@+id/Button09"
            android:text="9"></Button>
    </TableRow>
    <TableRow
        android:id="@+id/TableRow02"
        android:layout_height="wrap_content"
        android:layout_width="fill_parent">
        <Button
            android:id="@+id/Button00"
            android:text="0"
            android:layout_column="1"></Button>
    </TableRow>
</TableLayout>
```



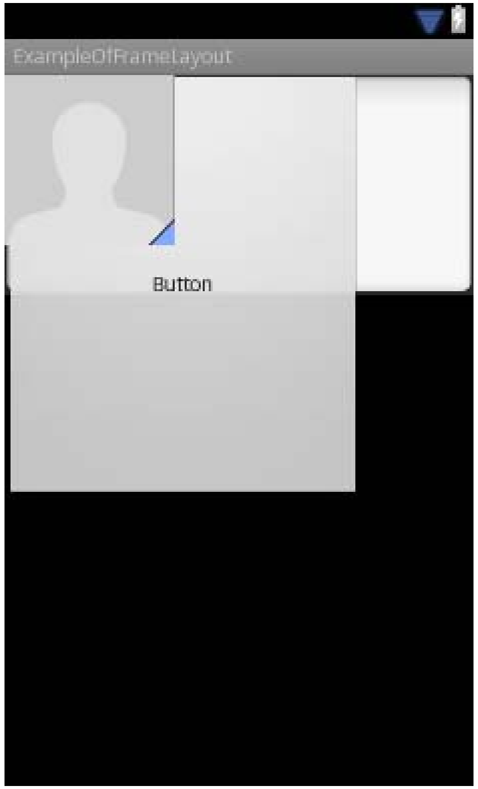
Layout : MultipleLayout

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="fill_parent"
    android:orientation="vertical"
    android:layout_height="fill_parent">
    <LinearLayout
        android:id="@+id/LinearLayout01"
        android:orientation="horizontal"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content">
        <TextView
            android:id="@+id/TextView01"
            android:layout_height="wrap_content"
            android:text="Call Me!"
            android:textSize="22pt"
            android:layout_width="wrap_content"
android:layout_gravity="center_vertical"></TextView>
        <AnalogClock
            android:id="@+id/AnalogClock01"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"></AnalogClock>
    </LinearLayout>
    <TableLayout
        android:id="@+id/TableLayout01"
        xmlns:android="http://schemas.android.com/apk/res/android"
        android:gravity="center_vertical"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_width="wrap_content">
        <TableRow
            android:id="@+id/TableRow01"
            android:layout_width="fill_parent"
            android:layout_height="fill_parent">
            <Button
                    android:id="@+id/Button01"
                    android:text="1"></Button>
            <Button
                    android:id="@+id/Button02"
                    android:text="2"></Button>
            <Button
                    android:id="@+id/Button03"
                    android:text="3"></Button>
        </TableRow>
```



Layout : FrameLayout, Fragment

- **FrameLayout :**
  - ✓ 자신의 좌상단 좌표를 기준으로 자신의 뷰를 배치하는 레이아웃.
  - ✓ 여러 개의 뷰들을 정의한 후 그들 중 하나만 번갈아 보여주는 용도로 사용



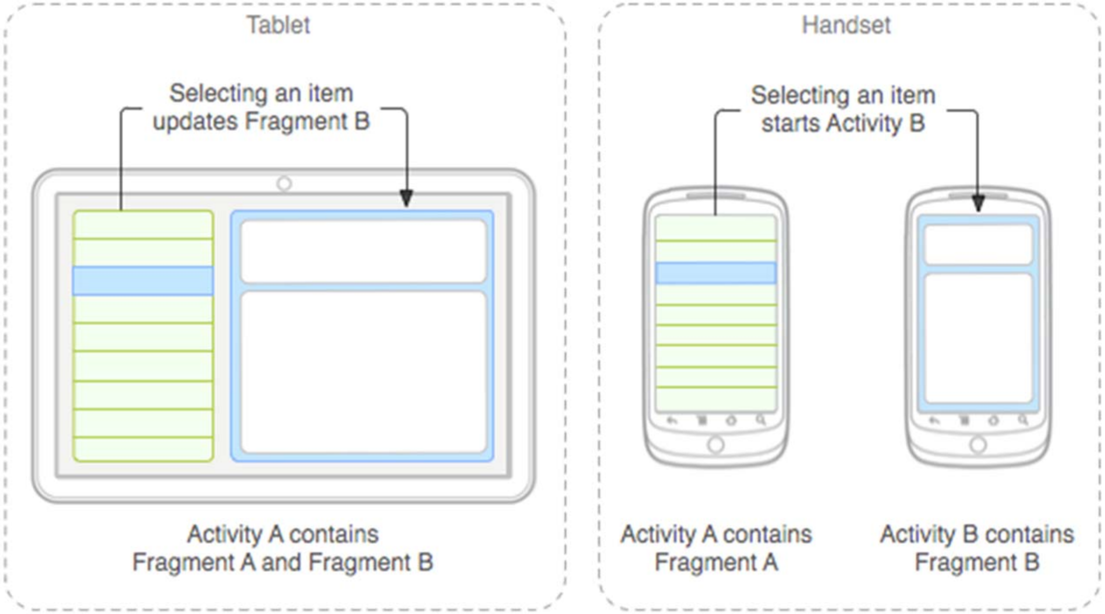
FrameLayout

```
<</TableLayout>
    <FrameLayout
        android:id="@+id/FrameLayout01"
        android:layout_height="wrap_content"
        xmlns:android="http://schemas.android.com/apk/res/android"
        android:layout_gravity="center"
        android:layout_width="fill_parent">
        <ImageView
            android:id="@+id/ImageView01"
            android:src="@drawable/green_rect"
            android:minHeight="200px"
            android:minWidth="200px"
            android:layout_width="fill_parent"
            android:layout_height="fill_parent"></ImageView>
        <ImageView
            android:id="@+id/ImageView02"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:src="@drawable/red_oval"
            android:minHeight="100px"
            android:minWidth="100px"
            android:layout_gravity="center"></ImageView>
    </FrameLayout>
</LinearLayout>
```

Layout : FrameLayout, Fragment

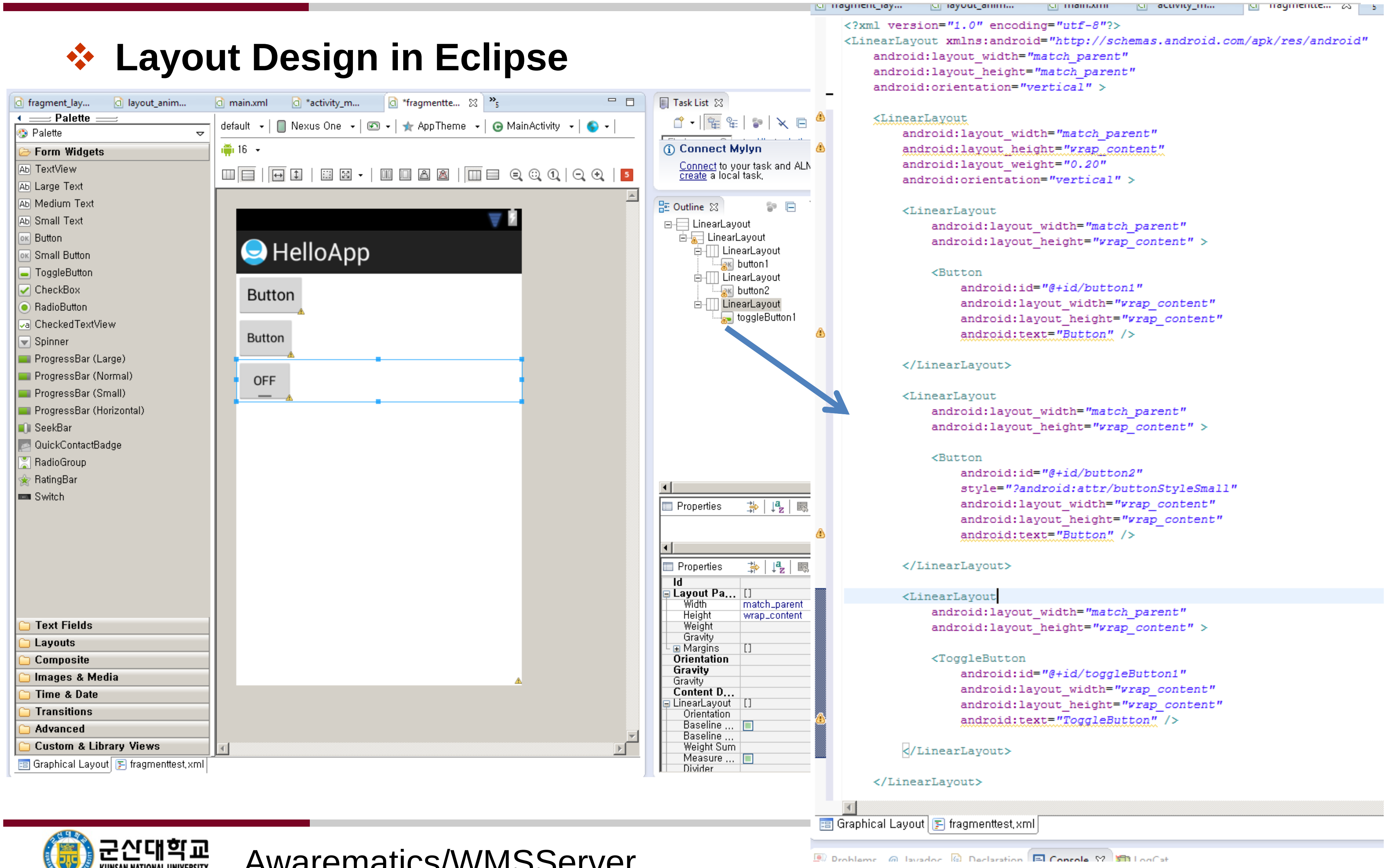
❖ **Fragment**

- ✓ 앱의 화면을 좌우 또는 상하 2개 또는 그 이상의 영역으로 나누어 선택적으로 사용


Tablet
Selecting an item updates Fragment B
Activity A contains Fragment A and Fragment B
Handset
Selecting an item starts Activity B
Activity A contains Fragment A
Activity B contains Fragment B

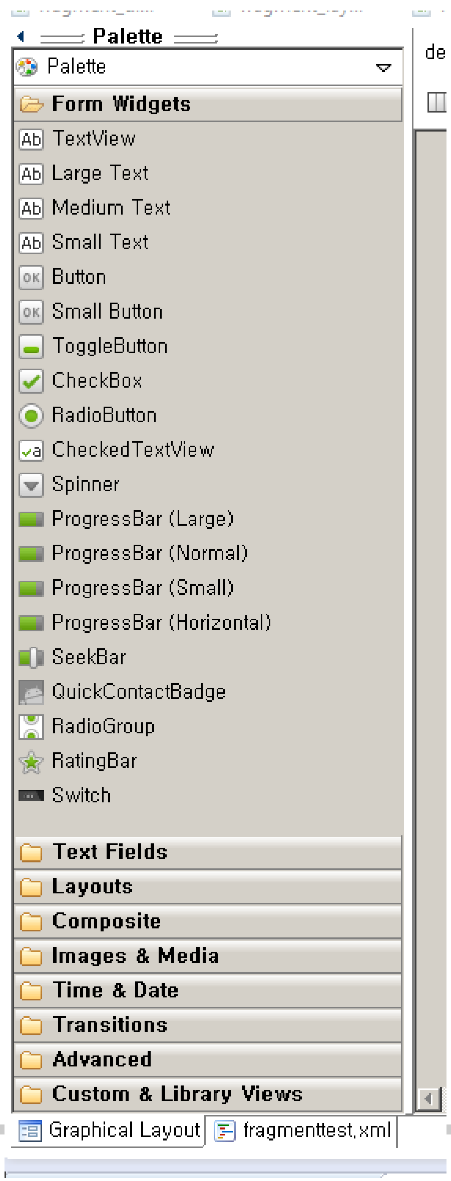
Layout : Example

❖ Layout Design in Eclipse



```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_weight="0.20"
        android:orientation="vertical" >

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

            <Button
                android:id="@+id/button1"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Button" />

        </LinearLayout>

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

            <Button
                android:id="@+id/button2"
                style="?android:attr/buttonStyleSmall"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Button" />

        </LinearLayout>

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

            <ToggleButton
                android:id="@+id/toggleButton1"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="ToggleButton" />

        </LinearLayout>

    </LinearLayout>
```

기본 위젯 : Form Widgets



Palette

Palette

Form Widgets

- TextView
- Large Text
- Medium Text
- Small Text
- Button
- Small Button
- ToggleButton
- CheckBox
- RadioButton
- CheckedTextView
- Spinner
- ProgressBar (Large)
- ProgressBar (Normal)
- ProgressBar (Small)
- ProgressBar (Horizontal)
- SeekBar
- QuickContactBadge
- RadioGroup
- RatingBar
- Switch

Text Fields

Layouts

Composite

Images & Media

Time & Date

Transitions

Advanced

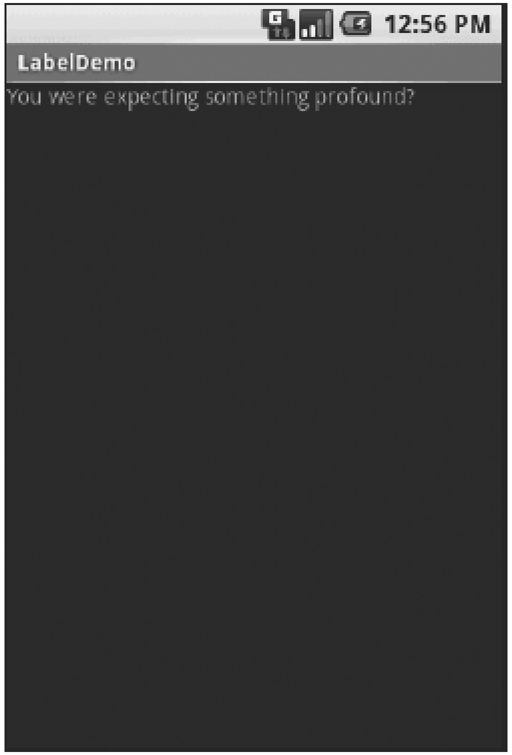
Custom & Library Views

Graphical Layout | fragmenttest.xml

기본 위젯 : TextView

❖ TextView XML

```
<?xml version="1.0" encoding="utf-8"?>
<TextView xmlns:android="http://schemas.android.com/apk/res/android"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="You were expecting something profound?"
/>
```



You were expecting something profound?

- ✓ android:typeface : 글꼴 종류 지정, monospace
- ✓ android:textStyle : bold, italic
- ✓ android:textColor : 글자색

기본 위젯 : TextView

❖ TextView XML 설정

- URL : http://developer.android.com/reference/android/widget/TextView.html

✓ android:ems

- TextView 너비 설정(12pt 글꼴은 12pt)
- maxEms, minEms 설정 가능

✓ android:lines

- TextView의 Line 수 설정가능
- maxLines, minLines 설정가능

✓ android:textSize

- sp(scaled-pixel) 단위를 사용 : 예 15sp

```
<TextView
        android:id="@+id/TextView04"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:lines ="2"
        android:ems="12"
        android:textSize="15sp"
        android:layout_marginRight="3dip"
        android:text="Hello kwnam@kunsan.ac.kr"
        android:autoLink="email|web"
/>
```

기본 위젯 : TextView

❖ TextView XML 설정

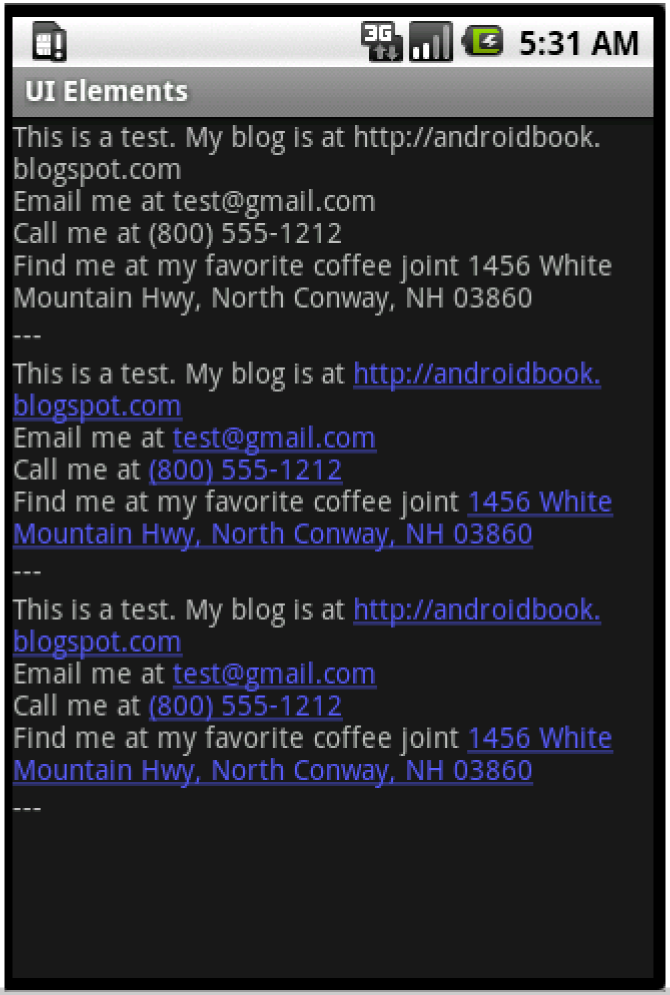
- ✓ android:autoLink
  - – Text안의 문자들 중에서 자동인식하여 Link화 함
  - – android:autoLink=“web|email” 등과 같이 사용
  - – web, email, phone, map, all 등 사용가능

- ✓ android:text=“@string/….”의 사용법
  - – @string은 res/values/ 밑의 <resources> 들중 string을 의미함
  - – 예 : android:text=“@string/autolink_test”
    - res/values/string.xml 안에
      - ◆ <resources>
      - ◆ <string name="autolink_test">This is a test. My blog is at
      - ◆ http://androidbook.blogspot.com\nEmail me at
      - ◆ test@gmail.com\nCall me at (800) 555-1212\nFind me at my coffee joint
      - ◆ 1456 White Mountain Hwy, North Conway, NH 03860
      - ◆ </string>

기본 위젯 : TextView

```
<ScrollView
    android:id="@+id/ScrollView01"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    xmlns:android="http://schemas.android.com/apk/res/android">
    <LinearLayout
        android:id="@+id/LinearLayout01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="vertical">
        <TextView
            android:id="@+id/TextView01"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/autolink_test" />
        <TextView
            android:id="@+id/TextView01"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/dash" />
        <TextView
            android:id="@+id/TextView02"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/autolink_test"
            android:autoLink="all"
            android:linksClickable="false" />
    </LinearLayout>
</ScrollView>
```

res/layout/text_display.xml



UI Elements

This is a test. My blog is at http://androidbook.blogspot.com
Email me at test@gmail.com
Call me at (800) 555-1212
Find me at my favorite coffee joint 1456 White Mountain Hwy, North Conway, NH 03860

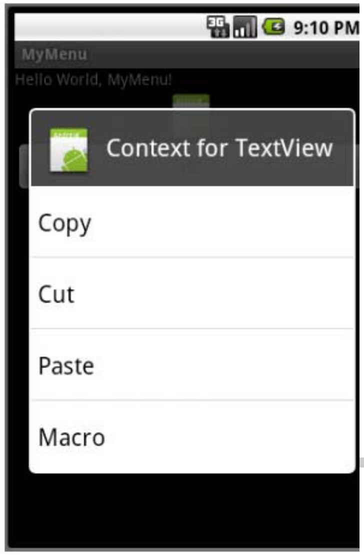
This is a test. My blog is at http://androidbook.blogspot.com
Email me at test@gmail.com
Call me at (800) 555-1212
Find me at my favorite coffee joint 1456 White Mountain Hwy, North Conway, NH 03860

This is a test. My blog is at http://androidbook.blogspot.com
Email me at test@gmail.com
Call me at (800) 555-1212
Find me at my favorite coffee joint 1456 White Mountain Hwy, North Conway, NH 03860

기본 위젯 : TextView

res/values/string.xml

```
<resources>
   <string
      name="hello">Hello World, ViewsMenu</string>
   <string
      name="app_name">UI Elements</string>
   <string
      name="spin_prompt">Choose a color</string>
   <string
      name="autolink_test">This is a test. My blog is at
      http://androidbook.blogspot.com\nEmail me at
      test@gmail.com\nCall me at (800) 555-1212\nFind me at my favorite coffee joint
      1456 White Mountain Hwy, North Conway, NH 03860
</string>
```

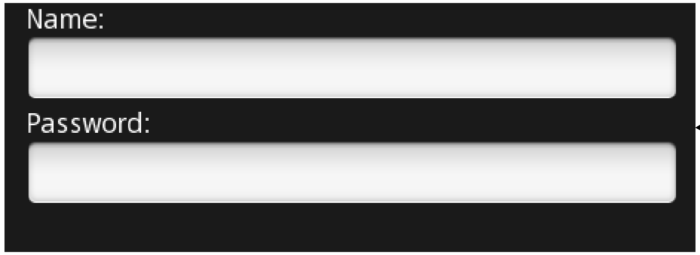


textdisplay.java

```
public class TextDisplay extends    Activity {

   @Override
   protected void onCreate(
      Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);

      setContentView(R.layout.text_display);

      TextView text = (TextView)findViewById(R.id.TextView02);
      registerForContextMenu(text);
   }

   @Override
   public void onCreateContextMenu(
      ContextMenu menu, View v, ContextMenuInfo menuInfo) {
      // TODO Auto-generated method stub
      super
         .onCreateContextMenu(
            menu, v, menuInfo);

      if (((TextView)v).getLinksClickable()) {
         menu.add("Disable Clickability") ;
      } else{
         menu.add("Enable Clickability");
      }
   }

   @Override
   public boolean onContextItemSelected(
      MenuItem item) {
      super
         .onContextItemSelected(item);

      TextView text = (TextView)findViewById(R.id.TextView02);
      if (text.getLinksClickable())
      {
         //text.setLinksClickable(false);
         text.setMovementMethod(null);
      }
      else
      {
         text.setLinksClickable(true);
         text.setMovementMethod(new
android.text.method.LinkMovementMethod());
      }
      return true;
   }
```

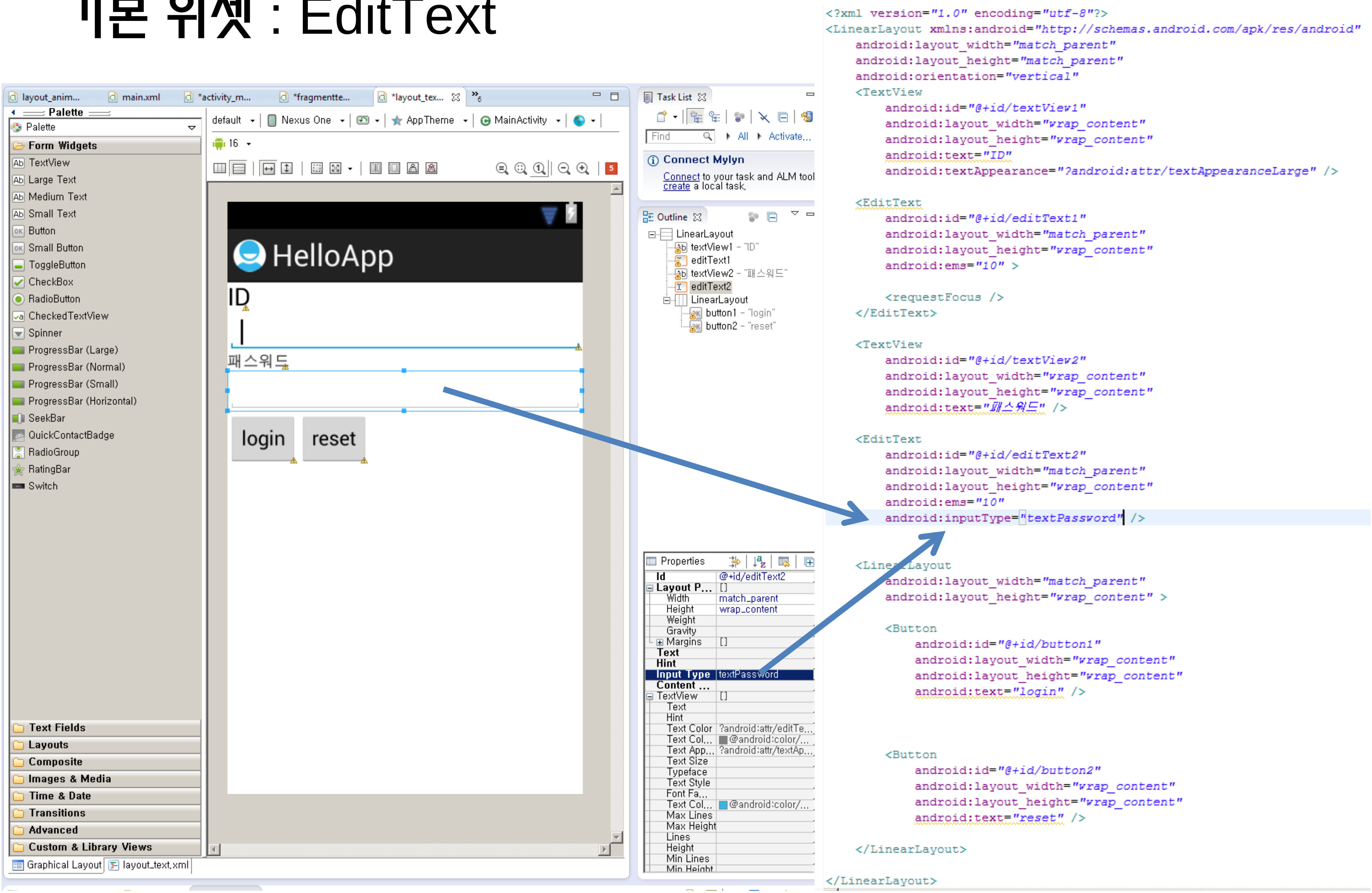
기본 위젯 : EditText

❖ EditText 예제(APIDemo)



```
<TextView
   android:id="@+id/username_view"
   android:layout_height="wrap_content"
   android:layout_width="wrap_content"
   android:layout_marginLeft="20dip"
   android:layout_marginRight="20dip"
   android:text="@string/alert_dialog_username"
   android:gravity="left"
   android:textAppearance="?android:attr/textAppearanceMedium" />

<EditText
   android:id="@+id/username_edit"
   android:layout_height="wrap_content"
   android:layout_width="fill_parent"
   android:layout_marginLeft="20dip"
   android:layout_marginRight="20dip"
   android:scrollHorizontally="true"
   android:autoText="false"
   android:capitalize="none"
   android:gravity="fill_horizontal"
   android:textAppearance="?android:attr/textAppearanceMedium" />

<TextView
   android:id="@+id/password_view"
   android:layout_height="wrap_content"
   android:layout_width="wrap_content"
   android:layout_marginLeft="20dip"
   android:layout_marginRight="20dip"
   android:text="@string/alert_dialog_password"
   android:gravity="left"
   android:textAppearance="?android:attr/textAppearanceMedium" />

<EditText
   android:id="@+id/password_edit"
   android:layout_height="wrap_content"
   android:layout_width="fill_parent"
   android:layout_marginLeft="20dip"
   android:layout_marginRight="20dip"
   android:scrollHorizontally="true"
   android:autoText="false"
   android:capitalize="none"
   android:gravity="fill_horizontal"
   android:password="true"
   android:textAppearance="?android:attr/textAppearanceMedium" />
```

기본 위젯 : EditText



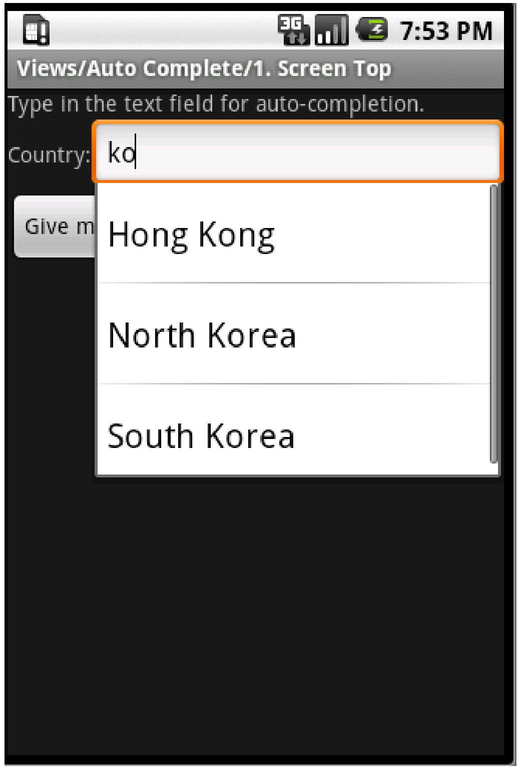
Id	@+id/editText2
Layout P...	[]
Width	match_parent
Height	wrap_content
Weight	
Gravity	
Margins	[]
Text	
Hint	
Input Type	textPassword
Content ...	
TextView	[]
Text	
Hint	
Text Color	?android:attr/editTe...
Text Col...	@android:color/...
Text App...	?android:attr/textAp...
Text Size	
Typeface	
Text Style	
Font Fa...	
Text Col...	@android:color/...
Max Lines	
Max Height	
Lines	
Height	
Min Lines	
Min Height	

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="ID"
        android:textAppearance="?android:attr/textAppearanceLarge" />

    <EditText
        android:id="@+id/editText1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10" >

        <requestFocus />
    </EditText>

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="패스워드" />

    <EditText
        android:id="@+id/editText2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPassword" />

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

        <Button
            android:id="@+id/button1"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="login" />


        <Button
            android:id="@+id/button2"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="reset" />

    </LinearLayout>

</LinearLayout>
```

기본 위젯 : EditText

❖ AutoComplete 예제

- ✓ 나라이름 autocomplete



7:53 PM

Views/Auto Complete/1. Screen Top

Type in the text field for auto-completion.

Country: ko

Give m

Hong Kong

North Korea

South Korea

android:completionHint => Hint

autocomplete_1.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="vertical"
   android:layout_width="fill_parent"
   android:layout_height="wrap_content">

   <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/autocomplete_1_instructions" />

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

      <TextView
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:text="@string/autocomplete_1_country" />

      <AutoCompleteTextView android:id="@+id/edit"
         android:layout_width="fill_parent"
         android:layout_height="wrap_content“
         android:completionHint =“나라 이름 중에 일부를 쓰세요”
         android:completionThreshold=“1”
       />

   </LinearLayout>

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/autocomplete_1_focus" />

</LinearLayout>
```

기본 위젯 : EditText

❖ AutoComplete 예제

- ✓ 나라이름 autocomplete

```
public class AutoComplete1 extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.autocomplete_1);

        ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
                android.R.layout.simple_dropdown_item_1line, COUNTRIES);
        AutoCompleteTextView textView = (AutoCompleteTextView) findViewById(R.id.edit);
        textView.setAdapter(adapter);
    }

    static final String[] COUNTRIES = new String[] {
"Afghanistan", "Albania", "Algeria", "American Samoa", "Andorra",
"Angola", "Anguilla", "Antarctica", "Antigua and Barbuda", "Argentina",
"Armenia", "Aruba", "Australia", "Austria", "Azerbaijan",
"Bahrain", "Bangladesh", "Barbados", "Belarus", "Belgium“}
}
```

기본 위젯 : EditText

❖ 입력 필터를 이용한 사용자 입력 제한

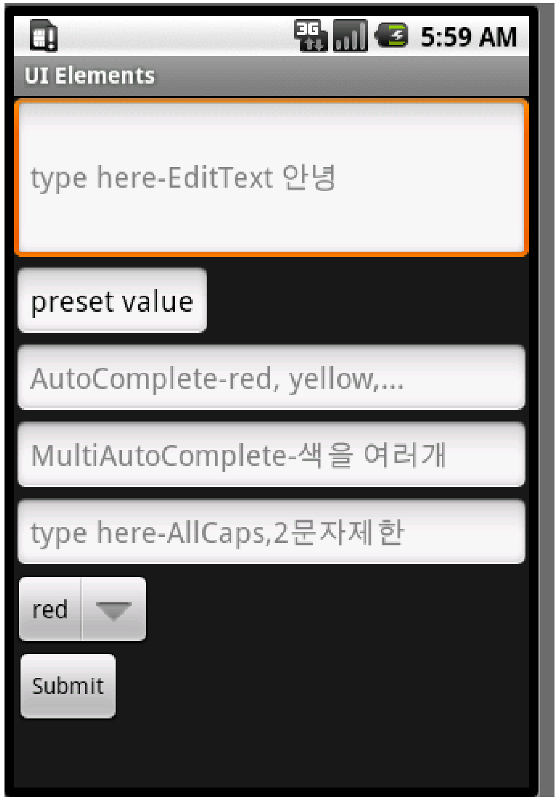
- ✓ setFilters() 함수를 이용하여 설정
  - 예

```
final EditText text_filtered =   (EditText) findViewById(R.id.input_filtered);
        text_filtered.setFilters(new InputFilter[]
            {
                new InputFilter.AllCaps(),
                new InputFilter.LengthFilter(2)
            });
```

- ✓ android.text.inputFilter를 이용하여 Filter 생성
  - AllCaps Class
    - InputFilter.AllCaps()에 의해 생성
    - method
      - filter(CharSequence source, int start, int end, Spanned dest, int dstart, int dend)
  - LengthFilter Class
    - InputFilter.LengthFilter(int max)에 의해 생성
    - method
      - filter(CharSequence source, int start, int end, Spanned dest, int dstart, int dend)

기본 위젯 : 종합 예제1

❖ 입력 필터를 이용한 사용자 입력 제한



5:59 AM

UI Elements

type here-EditText 안녕

preset value

AutoComplete-red, yellow,...

MultiAutoComplete-색을 여러개

type here-AllCaps,2문자제한

red

Submit

```
<LinearLayout
     android:id="@+id/LinearLayout01"
     android:orientation="vertical"
     android:layout_height="fill_parent"
     android:layout_width="fill_parent">
     <EditText
        android:id="@+id/EditText01"
        android:layout_height="wrap_content"
        android:hint="type here-EditText 안녕"
        android:lines="4"
        android:layout_width="fill_parent" />
     <EditText
        android:id="@+id/EditText02"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="preset value"
        android:editable="false"></EditText>
     <AutoCompleteTextView
        android:id="@+id/AutoCompleteTextView01"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:hint="AutoComplete-red, yellow,..."
        android:completionHint="Pick a color or type your own"
        android:completionThreshold="1" />
     <MultiAutoCompleteTextView
        android:id="@+id/MultiAutoCompleteTextView01"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:hint="MultiAutoComplete-색을 여러개"
        android:completionThreshold="1"
        android:completionHint="Pick a color or type your own" />
     <EditText
        android:id="@+id/input_filtered"
        android:layout_height="wrap_content"
        android:hint="type here-AllCaps,2문자제한"
        android:layout_width="fill_parent" />
     <Spinner
        android:id="@+id/Spinner01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:entries="@array/colors"
        android:prompt="@string/spin_prompt" />
     <Button
        android:id="@+id/submit"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Submit" />
  </LinearLayout>
```

기본 위젯 : 종합 예제1

❖ 입력제한 소스

TextInput.java

```
public class TextInput extends Activity {

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

final EditText text1 = (EditText)findViewById(R.id.EditText01);
final EditText text2 = (EditText)findViewById(R.id.EditText02);
final Spinner spin = (Spinner)findViewById(R.id.Spinner01);

final Button submit = (Button)findViewById(R.id.submit);
submit.setOnClickListener(new OnClickListener() {

public void onClick(View v) {
  TextView text_sel = (TextView)spin.getSelectedView();
  Toast.makeText(TextInput.this, "1 = "+text1.getText()+ " 2 = “
    + text2.getText() + "\n spinner = "+text_sel.getText(), Toast.LENGTH_SHORT).show();
  }});

   final String[] COLORS =
       {
         "red", "green", "orange", "blue", "purple",
         "black", "yellow", "cyan", "magenta" };
     ArrayAdapter<String> adapter =
       new ArrayAdapter<String>(
         this,
         android.R.layout.simple_dropdown_item_1line,
         COLORS);
     AutoCompleteTextView text =
       (AutoCompleteTextView) findViewById(R.id.AutoCompleteTextView01);
     text
       .setAdapter(adapter);
```

```
  MultiAutoCompleteTextView mtext =
          (MultiAutoCompleteTextView) findViewById(R.id.MultiAutoCompleteTextView01);
       mtext
         .setAdapter(adapter);
       mtext
         .setTokenizer(new MultiAutoCompleteTextView.CommaTokenizer());

       final EditText text_filtered =
         (EditText) findViewById(R.id.input_filtered);
       text_filtered
         .setFilters(new InputFilter[]
         {
           new InputFilter.AllCaps(),
           new InputFilter.LengthFilter(
             2) });

    }
  }
```

기본 위젯 : Image

❖ ImageView와 ImageButton

- http://developer.android.com/reference/android/widget/ImageButton.html

✓ 클래스 종류

- ImageView : Image를 넣을수 있는 TextView
- ImageButton : Image를 넣을수 있는 Button

✓ Image를 넣는 방법

- android:src 속성에 Image 파일을 지정

기본 위젯 : Button

❖ Button XML과 OnClickListener

✓ Button XML의 예

```
<Button
   android:id="@+id/basic_button"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="Basic Button“
/>
```

```
<CheckBox
         android:id="@+id/checkbox"
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:text="Check me?“
         />
```

```
<RadioGroup
android:id="@+id/RadioGroup01"
android:layout_width="wrap_content"
android:layout_height="wrap_content">
<RadioButton
android:id="@+id/RadioButton01"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Option 1"></RadioButton>
<RadioButton
android:id="@+id/RadioButton02"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Option 2"></RadioButton>
</RadioGroup>
```

```
<ImageButton
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:id="@+id/image_button"
         android:src="@drawable/droid">
</ImageButton>
```

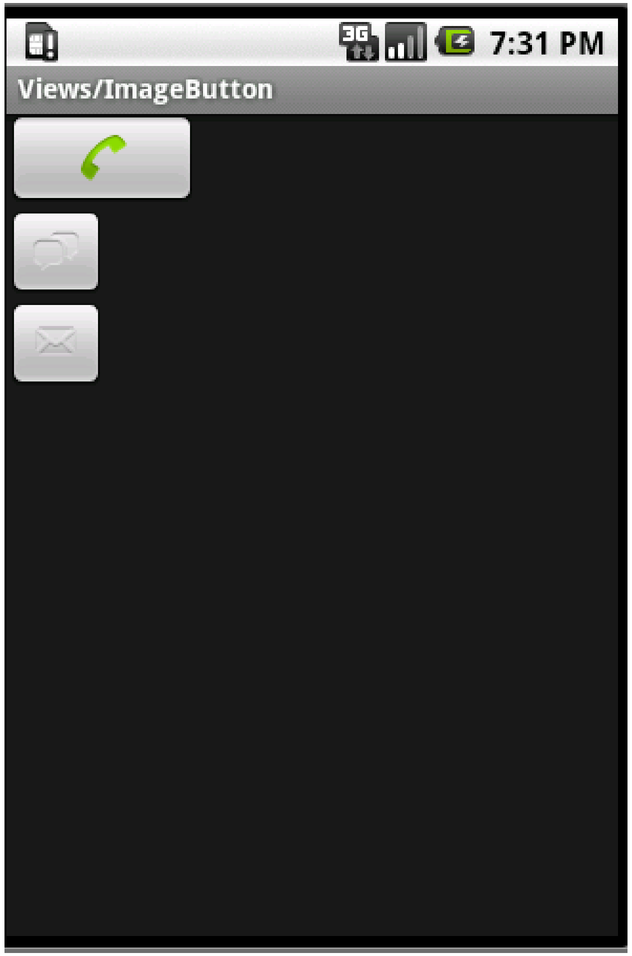
```
<ToggleButton
         android:id="@+id/toggle_button"
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:text="Toggle"
         android:textOff="Disabled"
         android:textOn="Enabled"
         />
```

기본 위젯 : Image

❖ ImageButton

```
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:orientation="vertical">

    <ImageButton
    android:layout_width="100dip"
    android:layout_height="50dip"
    android:src="@android:drawable/sym_action_call" />

   <ImageButton
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:src="@android:drawable/sym_action_chat" />

   <ImageButton
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:src="@android:drawable/sym_action_email" />
</LinearLayout>
```

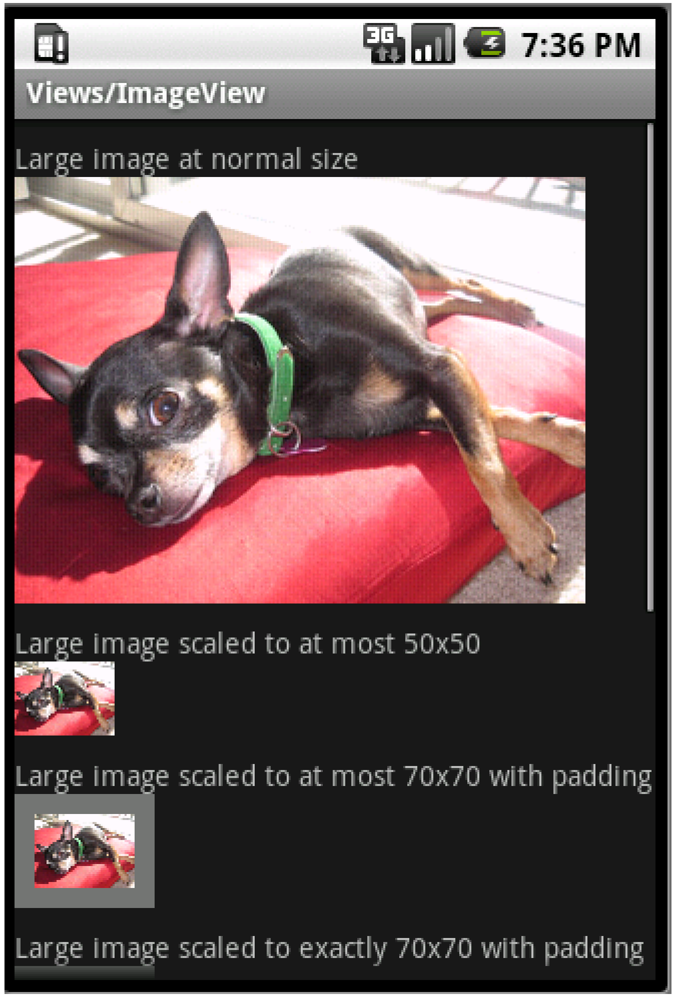
```
public class ImageButton1 extends Activity {

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.image_button_1);
    }
}
```



기본 위젯 : Image

❖ ImageView 예제(APIDemo)

```
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent">

  <LinearLayout
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:orientation="vertical">

    <!-- The following four examples use a large image -->
    <!-- 1. Non-scaled view, for reference -->
    <TextView
      android:layout_width="fill_parent"
      android:layout_height="wrap_content"
      android:paddingTop="10dip"
      android:text="@string/image_view_large_normal"/>
    <ImageView
      android:src="@drawable/sample_1"
      android:adjustViewBounds="true"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content" />

    <!-- 2. Limit to at most 50x50 -->
    <TextView
      android:layout_width="fill_parent"
      android:layout_height="wrap_content"
      android:paddingTop="10dip"
      android:text="@string/image_view_large_at_most"/>
    <ImageView
      android:src="@drawable/sample_1"
      android:adjustViewBounds="true"
      android:maxWidth="50dip"
      android:maxHeight="50dip"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content" />
```



Views/ImageView

Large image at normal size

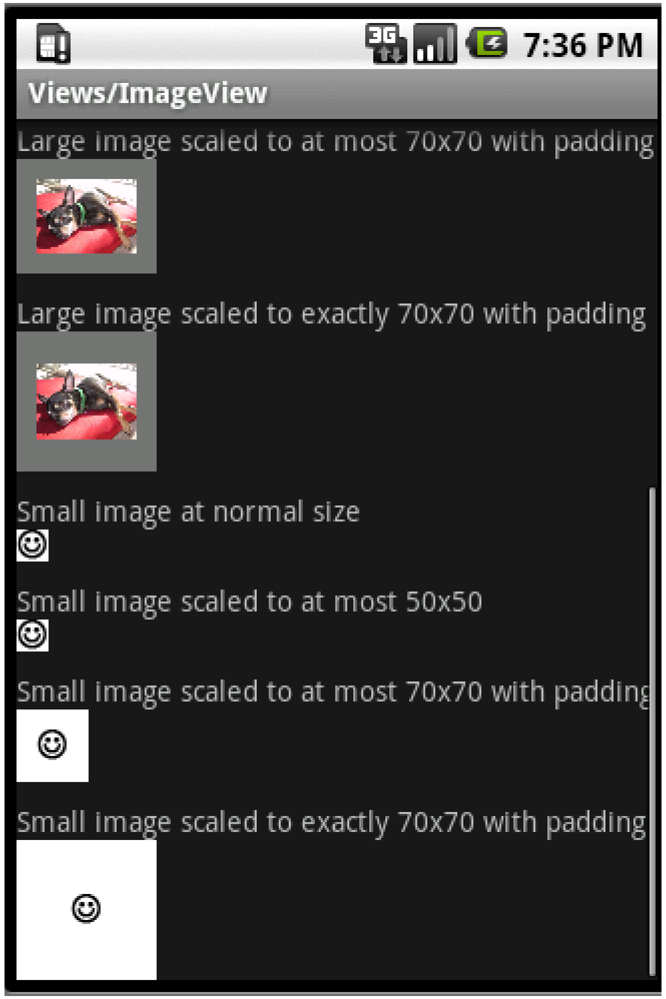
Large image scaled to at most 50x50

Large image scaled to at most 70x70 with padding

Large image scaled to exactly 70x70 with padding

기본 위젯 : Image

❖ ImageView 예제(APIDemo)



Views/ImageView

Large image scaled to at most 70x70 with padding

Large image scaled to exactly 70x70 with padding

Small image at normal size

Small image scaled to at most 50x50

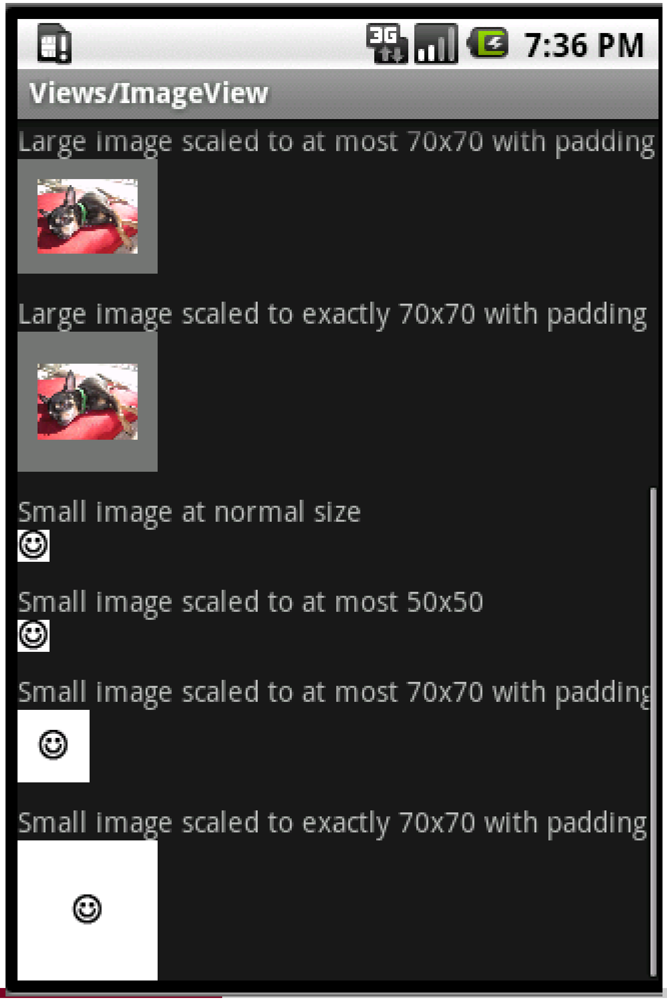
Small image scaled to at most 70x70 with padding

Small image scaled to exactly 70x70 with padding

```
<!-- 3. Limit to at most 70x70, with 10 pixels of padding all around -->
    <TextView
       android:layout_width="fill_parent"
       android:layout_height="wrap_content"
       android:paddingTop="10dip"
       android:text="@string/image_view_large_at_most_padded"/>
   <ImageView
       android:src="@drawable/sample_1"
       android:background="#66FFFFFF"
       android:adjustViewBounds="true"
       android:maxWidth="70dip"
       android:maxHeight="70dip"
       android:padding="10dip"
       android:layout_width="wrap_content"
       android:layout_height="wrap_content" />

    <!-- 4. Limit to exactly 70x70, with 10 pixels of padding all around -->
    <TextView
       android:layout_width="fill_parent"
       android:layout_height="wrap_content"
       android:paddingTop="10dip"
       android:text="@string/image_view_large_exactly_padded"/>
    <ImageView
       android:src="@drawable/sample_1"
       android:background="#66FFFFFF"
       android:scaleType="centerInside"
       android:padding="10dip"
       android:layout_width="70dip"
       android:layout_height="70dip" />

    <!-- Repeating the previous four examples with small image -->
    <!-- 1. Non-scaled view, for reference -->
    <TextView
       android:layout_width="fill_parent"
       android:layout_height="wrap_content"
       android:paddingTop="10dip"
       android:text="@string/image_view_small_normal"/>
    <ImageView
       android:src="@drawable/stat_happy"
       android:background="#FFFFFFFF"
       android:adjustViewBounds="true"
       android:layout_width="wrap_content"
       android:layout_height="wrap_content" />
```

기본 위젯 : Image

❖ ImageView 예제(APIDemo)



7:36 PM

Views/ImageView

Large image scaled to at most 70x70 with padding

Large image scaled to exactly 70x70 with padding

Small image at normal size

Small image scaled to at most 50x50

Small image scaled to at most 70x70 with padding

Small image scaled to exactly 70x70 with padding

```
<!-- 2. Limit to at most 50x50 -->
    <TextView
       android:layout_width="fill_parent"
       android:layout_height="wrap_content"
       android:paddingTop="10dip"
       android:text="@string/image_view_small_at_most"/>
    <ImageView
       android:src="@drawable/stat_happy"
       android:background="#FFFFFFFF"
       android:adjustViewBounds="true"
       android:maxWidth="50dip"
       android:maxHeight="50dip"
       android:layout_width="wrap_content"
       android:layout_height="wrap_content" />

   <!-- 3. Limit to at most 70x70, with 10 pixels of padding all around -->
    <TextView
       android:layout_width="fill_parent"
       android:layout_height="wrap_content"
       android:paddingTop="10dip"
       android:text="@string/image_view_small_at_most_padded"/>
    <ImageView
       android:src="@drawable/stat_happy"
       android:background="#FFFFFFFF"
       android:adjustViewBounds="true"
       android:maxWidth="70dip"
       android:maxHeight="70dip"
       android:padding="10dip"
       android:layout_width="wrap_content"
       android:layout_height="wrap_content" />

    <!-- 4. Limit to exactly 70x70, with 10 pixels of padding all around -->
    <TextView
       android:layout_width="fill_parent"
       android:layout_height="wrap_content"
       android:paddingTop="10dip"
       android:text="@string/image_view_small_exactly_padded"/>
    <ImageView
       android:src="@drawable/stat_happy"
       android:background="#FFFFFFFF"
       android:scaleType="centerInside"
       android:padding="10dip"
       android:layout_width="70dip"
       android:layout_height="70dip" />


  </LinearLayout>
</ScrollView>
```

기본 위젯 : Button

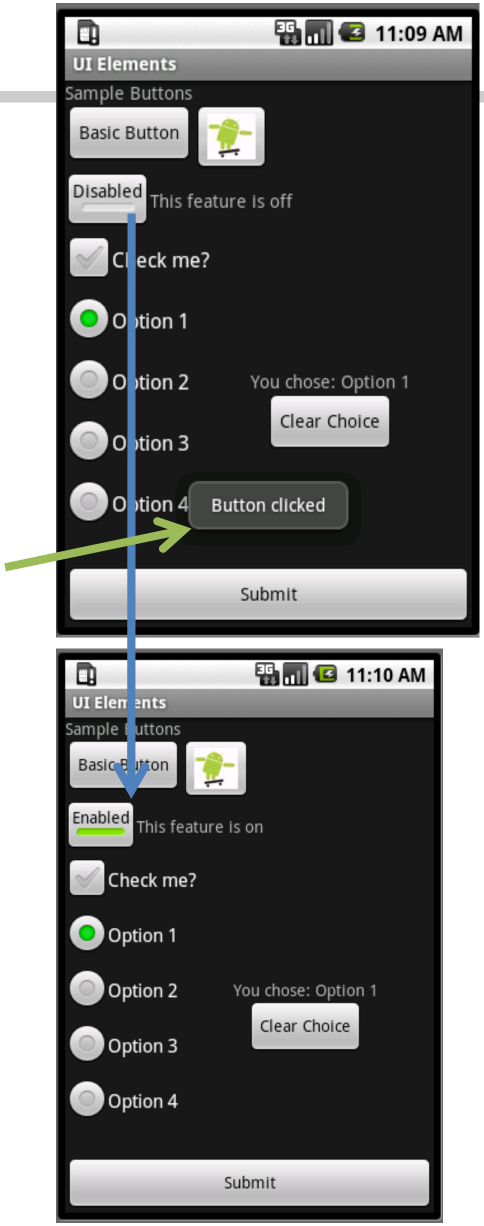
❖ Button의 OnClickListener

✓ Toast를 이용하여 화면에 표시하기

```
final Button basic_button = (Button) findViewById(R.id.basic_button);
basic_button.setOnClickListener(new View.OnClickListener() {
          public void onClick(View v) {
                         Toast.makeText(Buttons.this, "Button clicked",
                         Toast.LENGTH_SHORT).show();
          }
     });
```

✓ 화면 내용 바꾸기

```
final ToggleButton toggle_button = (ToggleButton) findViewById(R.id.toggle_button);
toggle_button.setOnClickListener(new View.OnClickListener() {
    public void onClick(View v) {
            TextView tv = (TextView) findViewById(R.id.text_feature);
            tv.setText( toggle_button.isChecked() ? "This feature is on" : "This feature is off");
            }
});
```



toast

기본 위젯 : Button

❖ RadioButton의 OnCheckedChangeListener

```
final RadioGroup group = (RadioGroup)findViewById(R.id.RadioGroup01);
group.setOnCheckedChangeListener(new RadioGroup.OnCheckedChangeListener() {

        public void onCheckedChanged(RadioGroup group, int checkedId) {
                TextView tv = (TextView) findViewById(R.id.TextView01);
                if (checkedId != -1) {
                                RadioButton rb = (RadioButton) findViewById(checkedId);

                        if (rb != null) {
                                tv.setText("You chose: " + rb.getText());
                        }
                        } else {
                                tv.setText("Choose 1");
                        }
                }
});
```

기본 위젯 : Button

❖ Focus의 이동 설정

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

        <Button android:id="@+id/top“
                android:nextFocusUp="@+id/bottom"
        ... />
        <Button android:id="@+id/bottom"
                android:nextFocusDown="@+id/top"
        ... />

</LinearLayout>
```

기본 위젯 : Button

❖ ClickListener를 구현하는 4가지 방법 : this

```
public class FirstProjActivity extends Activity implements OnClickListener{
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);

        Button bt = (Button)findViewById(R.id.start);
        Button bt1 = (Button)findViewById(R.id.start2);

        bt.setOnClickListener(this);
        bt1.setOnClickListener(this);
    }

 public void onClick(View v) {
  // TODO Auto-generated method stub
  switch (v.getId()){
  case R.id.start:
   Intent i = new Intent(this,SecondActivity.class);
   Toast.makeText(this, R.string.start_string, Toast.LENGTH_SHORT).show();
   break;
  case R.id.start2:
   break;
   default :
    break;
  }
 }

}
```

기본 위젯 : Button

❖ ClickListener를 구현하는 4가지 방법 : Inner Class

```
public class FirstProjActivity extends Activity{
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);

        Button bt = (Button)findViewById(R.id.start);
        Button bt1 = (Button)findViewById(R.id.start2);

        bt.setOnClickListener(new MyHandler());
    }

    class MyHandler implements OnClickListener{

    public void onClick(View v) {
   // TODO Auto-generated method stub

    Toast.makeText(FirstProjActivity.this, R.string.start_string, Toast.LENGTH_SHORT).show();
    }
   }

}
```

기본 위젯 : Button

❖ ClickListener를 구현하는 4가지 방법 : Anonymous Class

```
public class FirstProjActivity extends Activity{
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);

    findViewById(R.id.start).setOnClickListener(new View.OnClickListener() {

                            public void onClick(View v) {
                             // TODO Auto-generated method stub

                            }
                           });
    }
}
```

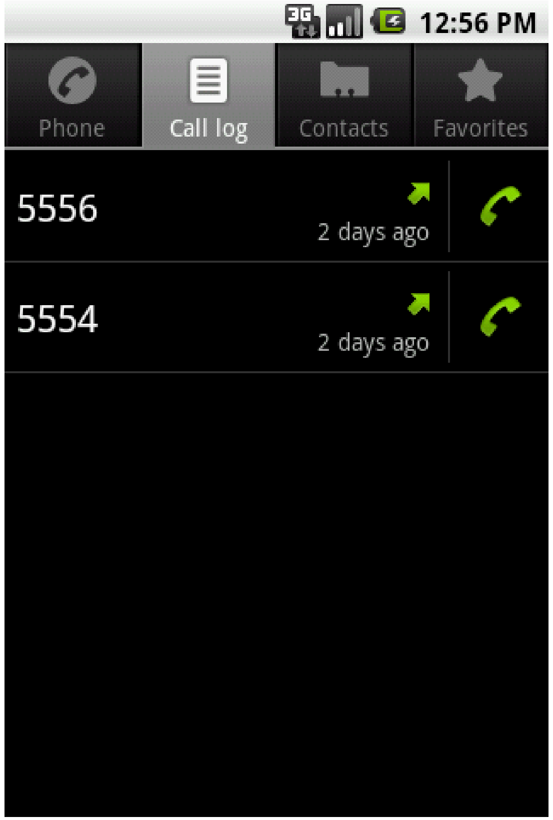
기본 위젯 : Button

❖ ClickListener를 구현하는 4가지 방법 : XML+

```
public class FirstProjActivity extends Activity{
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);

    }
    public void fire(View v){

    }
}

  <Button
        android:id="@+id/test1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="@string/test_string"
        android:onClick="fire" />
```

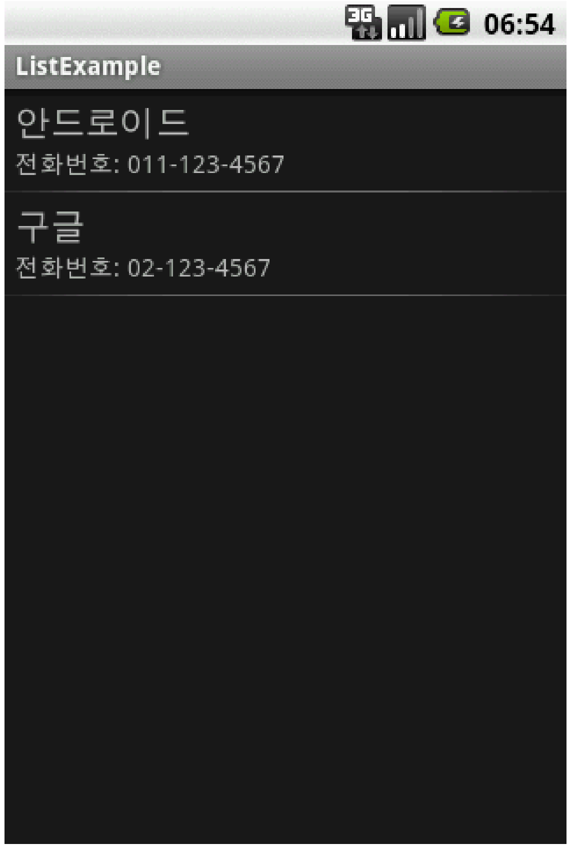
기본위젯 : ListView

❖ ListView 란?



5556
2 days ago

5554
2 days ago



ListExample

안드로이드
전화번호: 011-123-4567

구글
전화번호: 02-123-4567

참조 : http://tigerwoods.tistory.com/, http://androidhuman.tistory.com

기본위젯 : ListView

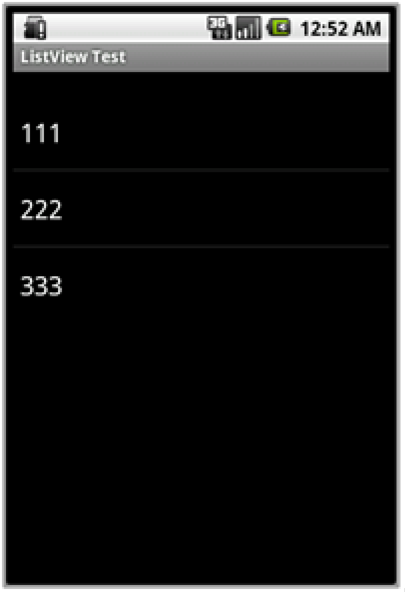
❖ ListView의 구성요소

- ✓ ListView
- ✓ Adapter
- ✓ 원본 데이터

List의 각 아이템을 채워 위한 view의
resource id

android.R.layout.*은 기본제공 위젯

```
String items[] = { "How", "to", "use", "ArrayAdapter?" };

ArrayAdapter <String> aa = new ArrayAdapter <String> (this,
                                                android.R.layout.simple_list_item_1,
                                                items);

ListView lv = (ListView)findViewById(R.id.listview);
lv.setAdapter(aa);
```



ListView Test

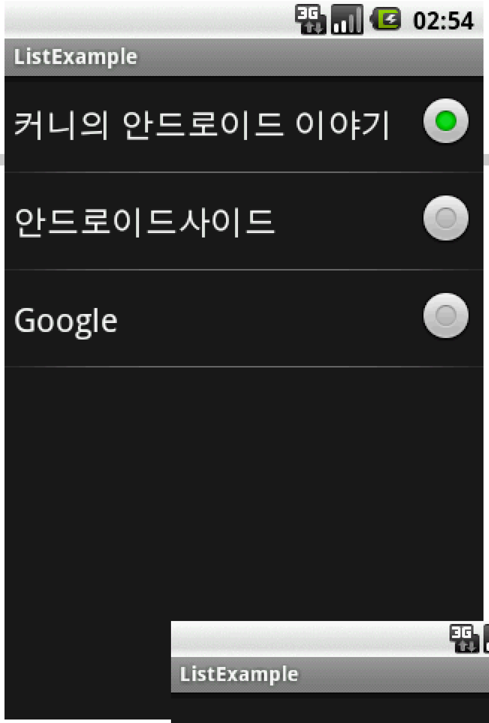
111

222

333

ArrayAdapter<String> aa = new ArrayAdapter<String>(this,
2. android.R.layout.simple_list_item_multiple_choice, list);

기본위젯 : ListView



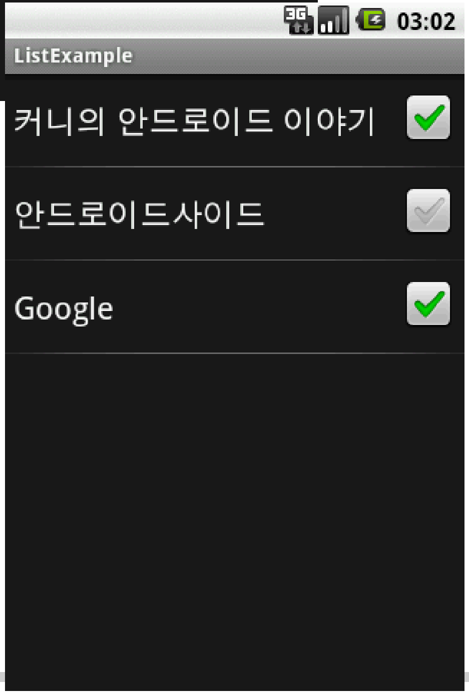
ListExample

커니의 안드로이드 이야기 ●

안드로이드사이드 ○

Google ○

ArrayAdapter<string> aa = new ArrayAdapter<string>(this,
android.R.layout.simple_list_item_single_choice, list);



ListExample

커니의 안드로이드 이야기 ☑

안드로이드사이드 □

Google ☑

ArrayAdapter<string> aa = new ArrayAdapter<string>(this,
android.R.layout.simple_list_item_multiple_choice, list);

기본위젯 : ListView

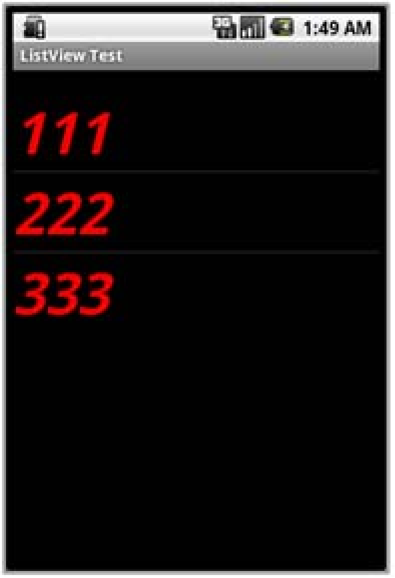
❖ 기본 위젯의 변경

프로그래머가 생성한 위젯을 이용

```
String items[] = { "How", "to", "use", "ArrayAdapter?" };

ArrayAdapter <String> aa = new ArrayAdapter <String> (this,
                                    R.layout.listview_item_layout_01,
                                    items);

ListView lv = (ListView)findViewById(R.id.listview);
lv.setAdapter(aa);
```

Listview_item_layout_01.xml

```
<?xml version="1.0" encoding="utf-8"?>
<TextView
        xmlns:android="http://schemas.android.com/apk/res/android"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:textSize="50px"
        android:textColor="#FF0000"
        android:textStyle="bold|italic" />
```



기본위젯 : ListView

❖ Activity를 상속하여 구현하는 방법

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/androi
android:orientation="vertical"
android:layout_width="fill_parent"
android:layout_height="fill_parent" >

        <!-- ListView중 선택된 아이템을 표시 함 -->
        <TextView
                android:id="@+id/textview"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="No Selection" />

        <!-- ListView의 layout -->
        <ListView
                android:id="@+id/listview"
                android:layout_width="fill_parent"
                android:layout_height="fill_parent" />

</LinearLayout>
```

```
public class MyListView_Activity extends Activity
                implements AdapterView.OnItemClickListener {

    String items[] = { "111", "222", "333" };
    ListView lv;
    TextView tv;

   /** Called when the activity is first created. */
   @Override
   public void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.main);

   ArrayAdapter<String> aa = new ArrayAdapter<String>(this,
                         android.R.layout.simple_list_item_1,
                 items);

    lv = (ListView)findViewById(R.id.listview);

     lv.setAdapter(aa);

     lv.setOnItemClickListener(this);

    tv = (TextView)findViewById(R.id.textview);
   }

   // lv에서 itemclick 이밴트가 발생시 호출되는 callback
   // tv객체는 lv의 선택된 아이템을 표시.
   public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
    if (parent == lv) {
        tv.setText(items[position]);
    }
   }
}
```

기본위젯 : ListView

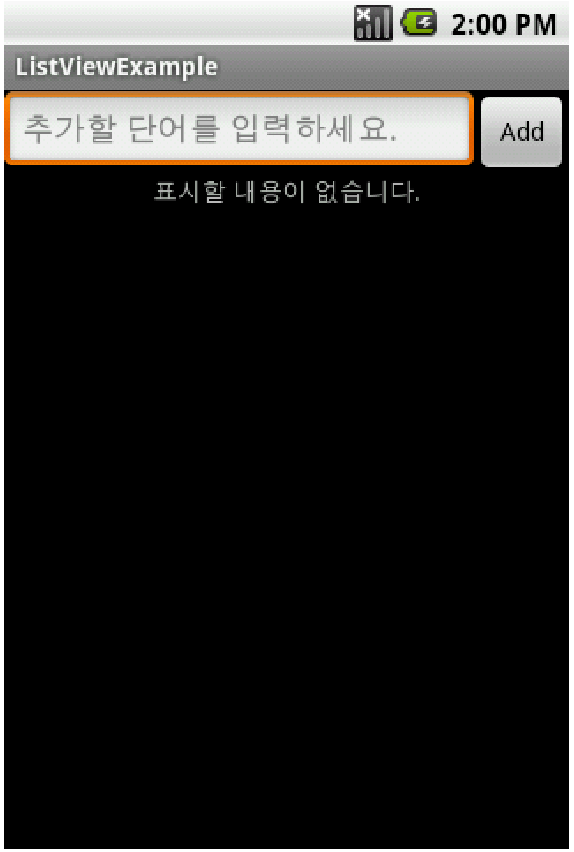
❖ ListActivity를 상속하여 구현하는 방법

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
        android:orientation="vertical"
        android:layout_width="fill_parent"
        android:layout_height="fill_parent" >

        <!-- ListView에서 선택된 item을 표시 함 -->
        <TextView
                android:id="@+id/textview"
                android:layout_width="fill_parent"
                android:layout_height="wrap_content"
                android:text="No Selection" />

        <!-- ListActivity에서 상속받은 객체는 항상  main view로 사용될  -->
        <!-- ListView "@id/android:list" 가 필요함 -->
        <ListView
                android:id="@id/android:list"
                android:layout_width="fill_parent"
                android:layout_height="fill_parent" />

        <!-- ListActivity에서 상속받은 객체는 ListView가 비어있으면  -->
        <!-- "@id/android:empty"로 id가 붙여진 TextView를 activity에 표시-->
        <TextView
                android:id="@id/android:empty"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="No Item" />
</LinearLayout>
```

```
public class MyListView_ListActivity extends ListActivity {

     // ListView에 뿌릴 data
    String items[] = { "111", "222", "333" };

    // ListView중 선택된 item을 표시할 TextView
     TextView tv;

     /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);

        ArrayAdapter <String> aa = new ArrayAdapter<String>(this,
                                android.R.layout.simple_list_item_1,
                                items);
      setListAdapter(aa);

        tv = (TextView)findViewById(R.id.textview);
    }

    // ListActivity의 메소드인 onListitemClick을 오버라이딩 하여
    // tv에 선택된 item의 text가 표시 되도록 함.
    public void onListItemClick(ListView l, View v, int position, long id) {
     tv.setText(items[position]);
    }
}
```

기본위젯 : ListView

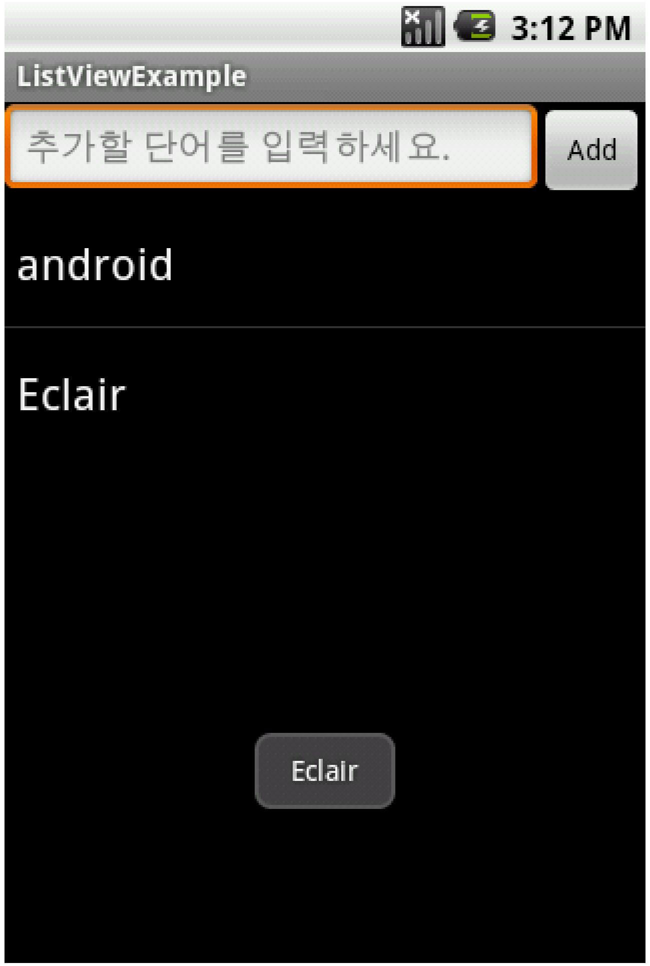
❖ Example : 단어 추가앱



ListActivity를 사용할 경우 필수

```
<ListView android:layout_height="wrap_content"
          android:id="@android:id/list"
             android:layout_width="fill_parent"/>

       <TextView android:layout_width="wrap_content"
             android:id="@android:id/empty"
             android:text="표시할 내용이 없습니다."
             android:layout_height="wrap_content"
             android:layout_gravity="center_horizontal"/>

<EditText android:layout_height="wrap_content"
       android:id="@+id/inputText"
       android:layout_width="0dp"
       android:layout_weight="5"
       android:hint="추가할 단어를 입력하세요."/>

<Button android:layout_height="wrap_content"
       android:layout_width="0dp"
       android:layout_weight="1"
       android:id="@+id/inputButton"
       android:text="Add"/>
```

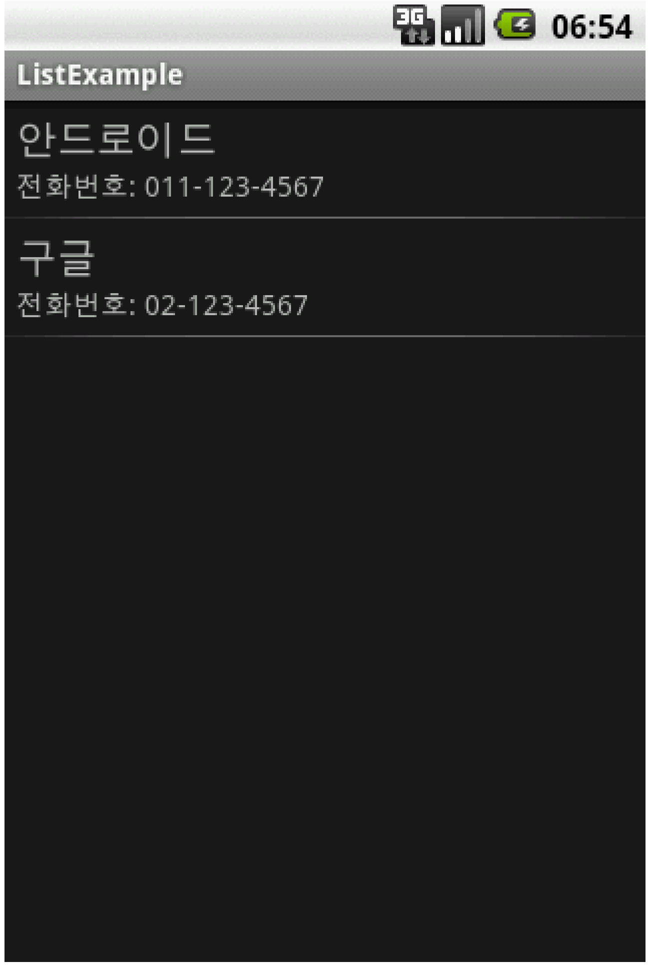
기본위젯 : ListView



```
public class ListViewExample extends ListActivity {
    private ArrayList<String> list;
    private ArrayAdapter<String> adapter;
    private EditText inputText;
    private Button inputButton;

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);

        inputText = (EditText)findViewById(R.id.inputText);
        inputButton = (Button)findViewById(R.id.inputButton);
        list = new ArrayList<String>();

        inputButton.setOnClickListener(new OnClickListener(){

                @Override
                public void onClick(View v) {
                    list.add(inputText.getText().toString());
                    inputText.setText("");
                    adapter.notifyDataSetChanged();
                }

        });

        adapter = new ArrayAdapter<String>(this,
                android.R.layout.simple_list_item_1, list);

        setListAdapter(adapter);
    }
}

@Override
protected void onListItemClick (ListView l, View v, int position, long id){
     super.onListItemClick(l, v, position, id);
     Toast.makeText(this, list.get(position), Toast.LENGTH_SHORT).show();
}
```

기본위젯 : ListView

❖ CustomAdapter의 구현



ListExample

안드로이드
전화번호: 011-123-4567

구글
전화번호: 02-123-4567

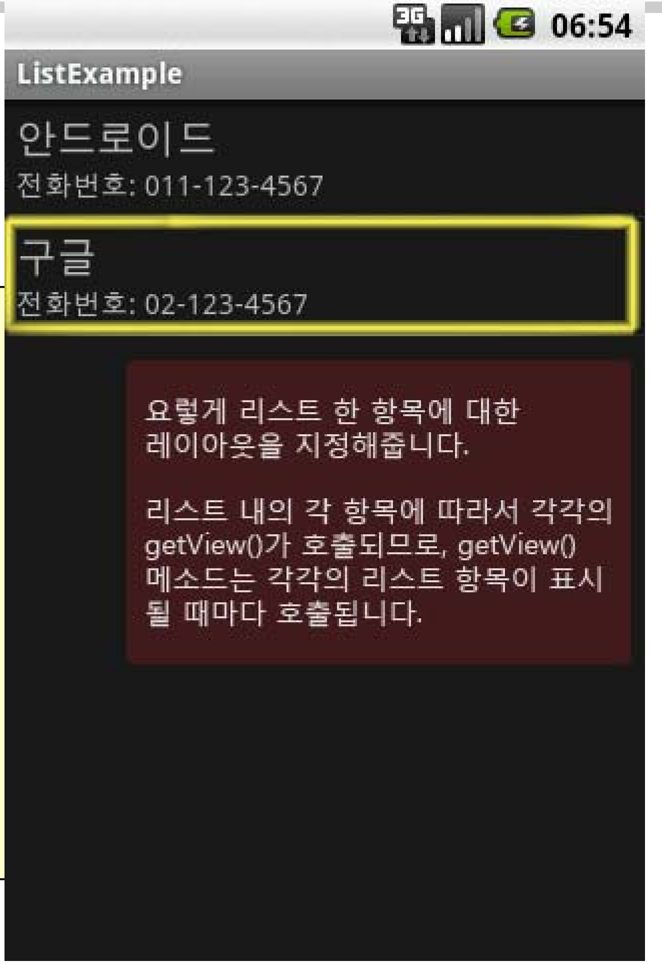
```
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.main);
    ArrayList<Person> m_orders = new ArrayList<Person>();

    Person p1 = new Person("안드로이드", "011-123-4567"); // 리스트에 추가할 객체입니다.
    Person p2 = new Person("구글", "02-123-4567"); // 리스트에 추가할 객체입니다.

    m_orders.add(p1); // 리스트에 객체를 추가합니다.
    m_orders.add(p2); // 리스트에 객체를 추가합니다.

    PersonAdapter m_adapter = new PersonAdapter(this, R.layout.row, m_orders); // 어댑터를 생성합니다.
    setListAdapter(m_adapter); //

  }

private class PersonAdapter extends ArrayAdapter<Person> {

    private ArrayList<Person> items;

    public PersonAdapter(Context context, int textViewResourceId, ArrayList<Person> items) {
        super(context, textViewResourceId, items);
        this.items = items;
    }
    @Override
    public View getView(int position, View convertView, ViewGroup parent) {
        View v = convertView;
        if (v == null) {
          LayoutInflater vi = (LayoutInflater)getSystemService(Context.LAYOUT_INFLATER_SERVICE);
          v = vi.inflate(R.layout.row, null);
        }
        Person p = items.get(position);
        if (p != null) {
            TextView tt = (TextView) v.findViewById(R.id.toptext);
            TextView bt = (TextView) v.findViewById(R.id.bottomtext);
            if (tt != null){
              tt.setText(p.getName());
            }
            if(bt != null){
                 bt.setText("전화번호: "+ p.getNumber());
            }
        }
        return v;
    }
```

기본위젯 : ListView

❖ CustomAdapter의 구현

Row.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="fill_parent"
   android:layout_height="wrap_content"
   android:padding="6dip" android:orientation="vertical">
      <TextView
         android:id="@+id/toptext"
         android:layout_width="fill_parent"
         android:gravity="center_vertical"
      android:layout_height="wrap_content" android:textSize="20px"/>
      <TextView
         android:layout_width="fill_parent"
         android:id="@+id/bottomtext"
         android:singleLine="true"
         android:ellipsize="marquee"
      android:layout_height="wrap_content"/>

</LinearLayout>
```



안드로이드
전화번호: 011-123-4567

구글
전화번호: 02-123-4567

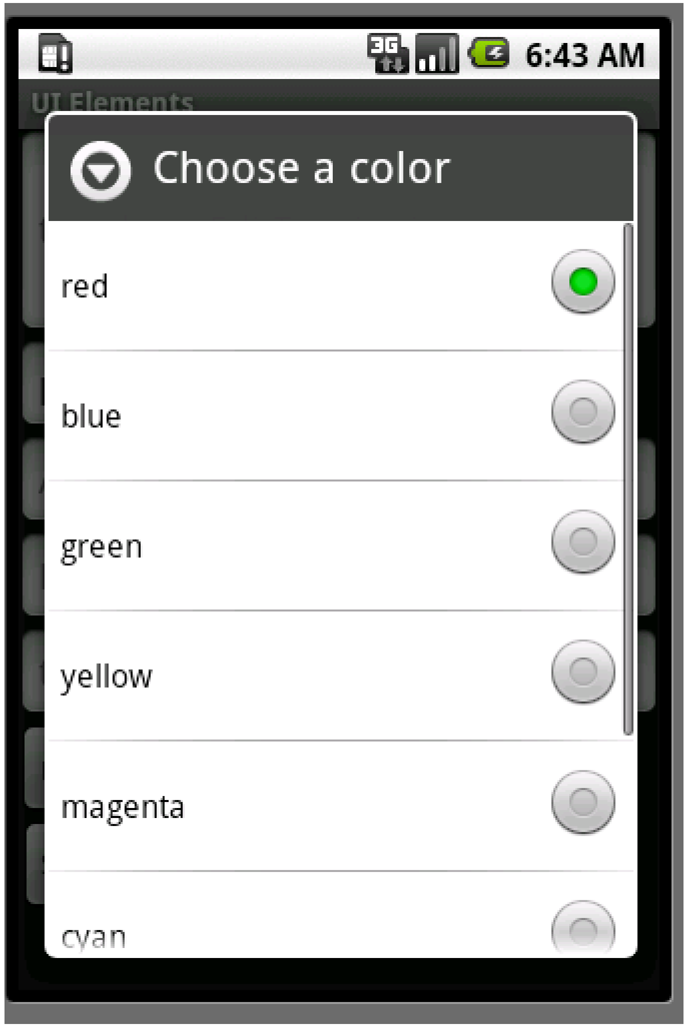
요렇게 리스트 한 항목에 대한 레이아웃을 지정해줍니다.

리스트 내의 각 항목에 따라서 각각의 getView()가 호출되므로, getView() 메소드는 각각의 리스트 항목이 표시될 때마다 호출됩니다.

기본 위젯 : Spinner

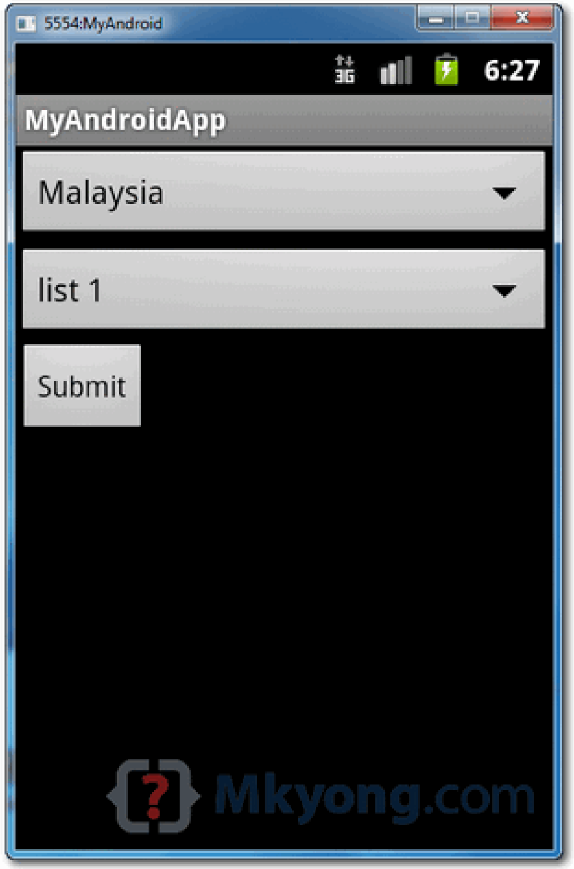
❖ Spinner 의 예

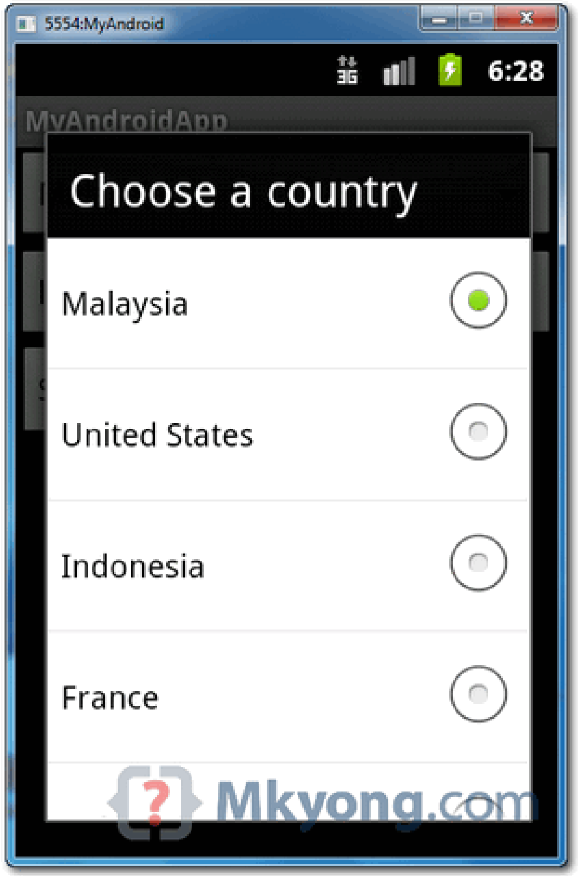
```
<Spinner
        android:id="@+id/Spinner01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:entries="@array/colors"
        android:prompt="@string/spin_prompt" />
```



기본 위젯 : Spinner

❖ Example





기본 위젯 : Spinner

- **xml**

strings.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>

    <string name="app_name">MyAndroidApp</string>
    <string name="country_prompt">Choose a country</string>

    <string-array name="country_arrays">
        <item>Malaysia</item>
        <item>United States</item>
        <item>Indonesia</item>
        <item>France</item>
        <item>Italy</item>
        <item>Singapore</item>
        <item>New Zealand</item>
        <item>India</item>
    </string-array>

</resources>
```

Main.xml

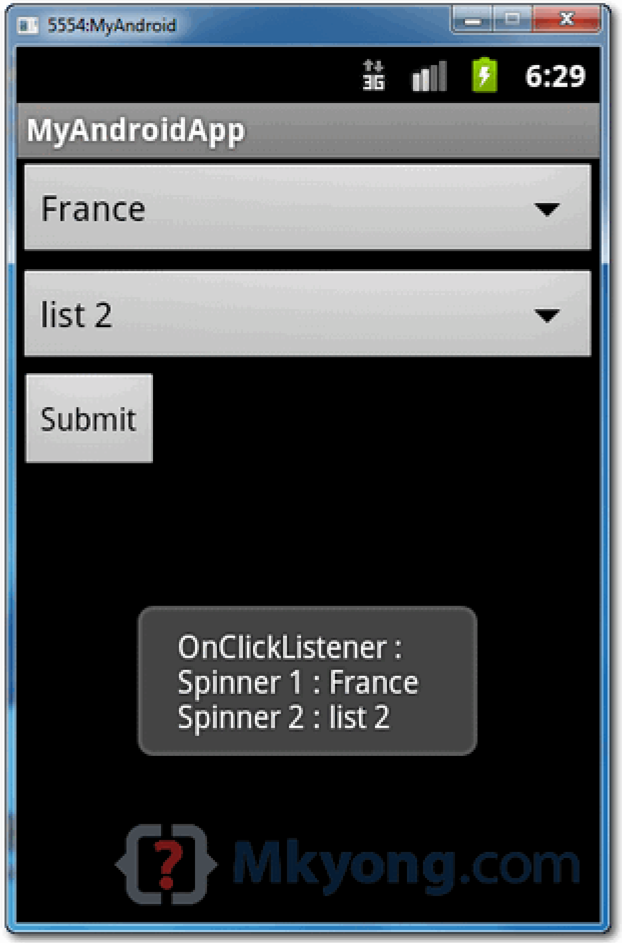
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:orientation="vertical" >

    <Spinner
        android:id="@+id/spinner1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:entries="@array/country_arrays"
        android:prompt="@string/country_prompt" />

    <Spinner
        android:id="@+id/spinner2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <Button
        android:id="@+id/btnSubmit"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Submit" />

</LinearLayout>
```

기본 위젯 : Spinner

```
public class MyAndroidAppActivity extends Activity {

  private Spinner spinner1, spinner2;
  private Button btnSubmit;

  @Override
  public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.main);

    addItemsOnSpinner2();
    addListenerOnButton();
    addListenerOnSpinnerItemSelection();
  }

  // add items into spinner dynamically
  public void addItemsOnSpinner2() {

    spinner2 = (Spinner) findViewById(R.id.spinner2);
    List<String> list = new ArrayList<String>();
    list.add("list 1");
    list.add("list 2");
    list.add("list 3");
    ArrayAdapter<String> dataAdapter = new ArrayAdapter<String>(this,
                                                      android.R.layout.simple_spinner_item, list);
    dataAdapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
    spinner2.setAdapter(dataAdapter);
  }
```

기본 위젯 : Spinner

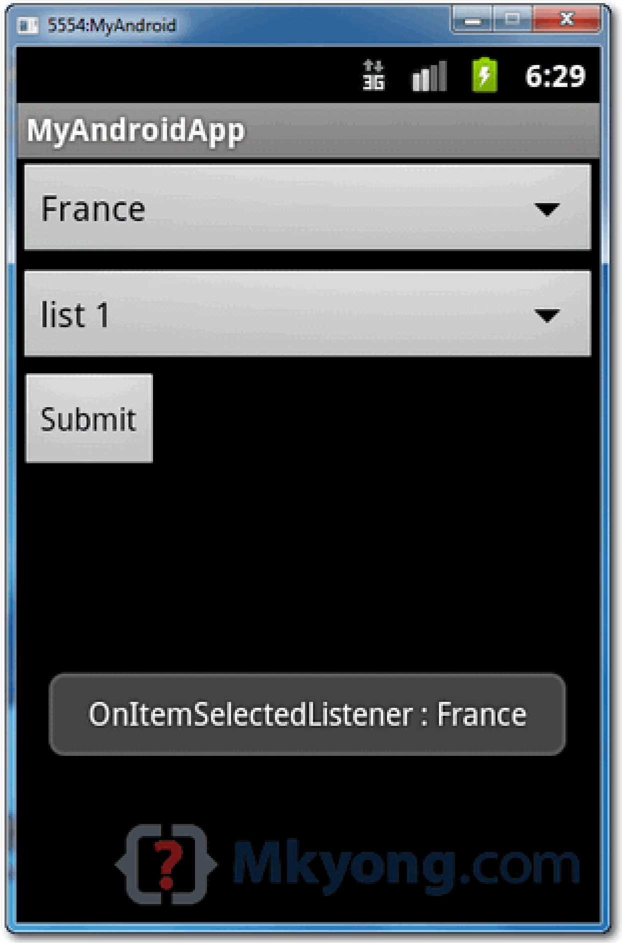
```
public void addListenerOnSpinnerItemSelection() {
    spinner1 = (Spinner) findViewById(R.id.spinner1);
    spinner1.setOnItemSelectedListener(new CustomOnItemSelectedListener());
 }

 // get the selected dropdown list value
 public void addListenerOnButton() {

    spinner1 = (Spinner) findViewById(R.id.spinner1);
    spinner2 = (Spinner) findViewById(R.id.spinner2);
    btnSubmit = (Button) findViewById(R.id.btnSubmit);

    btnSubmit.setOnClickListener(new OnClickListener() {

      @Override
      public void onClick(View v) {

        Toast.makeText(MyAndroidAppActivity.this,
         "OnClickListener : " +
              "\nSpinner 1 : "+ String.valueOf(spinner1.getSelectedItem()) +
              "\nSpinner 2 : "+ String.valueOf(spinner2.getSelectedItem()),
             Toast.LENGTH_SHORT).show();
      }

    });
 }
```



OnClickListener :
Spinner 1 : France
Spinner 2 : list 2

기본 위젯 : Spinner

```
public class CustomOnItemSelectedListener implements OnItemSelectedListener {

  public void onItemSelected(AdapterView<?> parent, View view, int pos,long id) {
     Toast.makeText(parent.getContext(),
          "OnItemSelectedListener : " + parent.getItemAtPosition(pos).toString(),
          Toast.LENGTH_SHORT).show();
  }

  @Override
  public void onNothingSelected(AdapterView<?> arg0) {
     // TODO Auto-generated method stub
  }

}
```

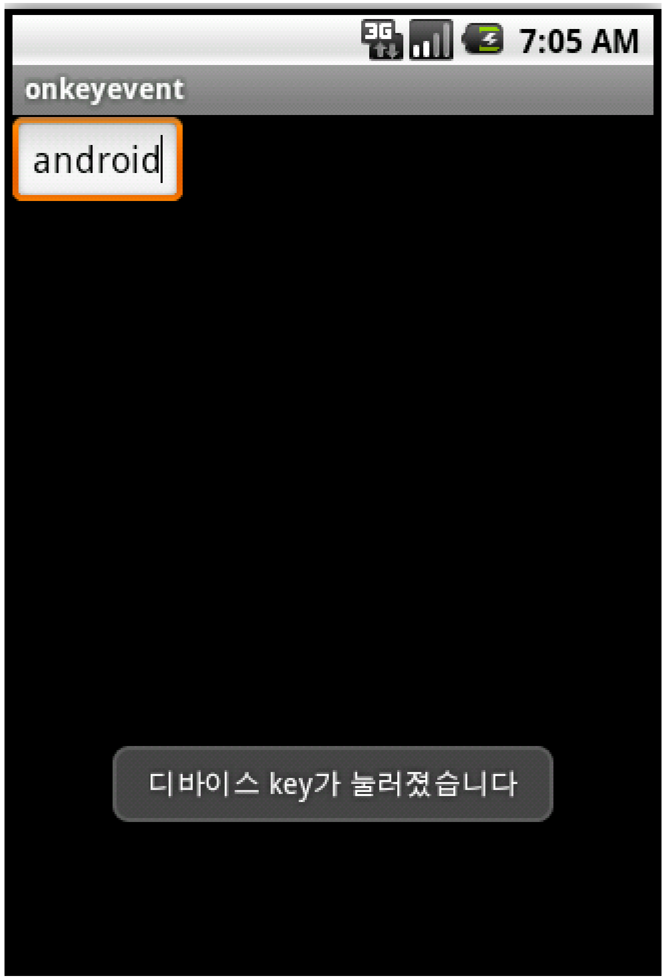


OnItemSelectedListener : France

View 공통 Events

- **onClick()**
  - ✓ View.OnClickListener.
- **onLongClick()**
  - ✓ View.OnLongClickListener.
- **onFocusChange()**
  - ✓ From View.OnFocusChangeListener.
- **onKey()**
  - ✓ View.OnKeyListener.
- **onTouch()**
  - ✓ View.OnTouchListener.
- **onCreateContextMenu()**
  - ✓ View.OnCreateContextMenuListener.

View 공통 Events



디바이스 key가 눌러졌습니다

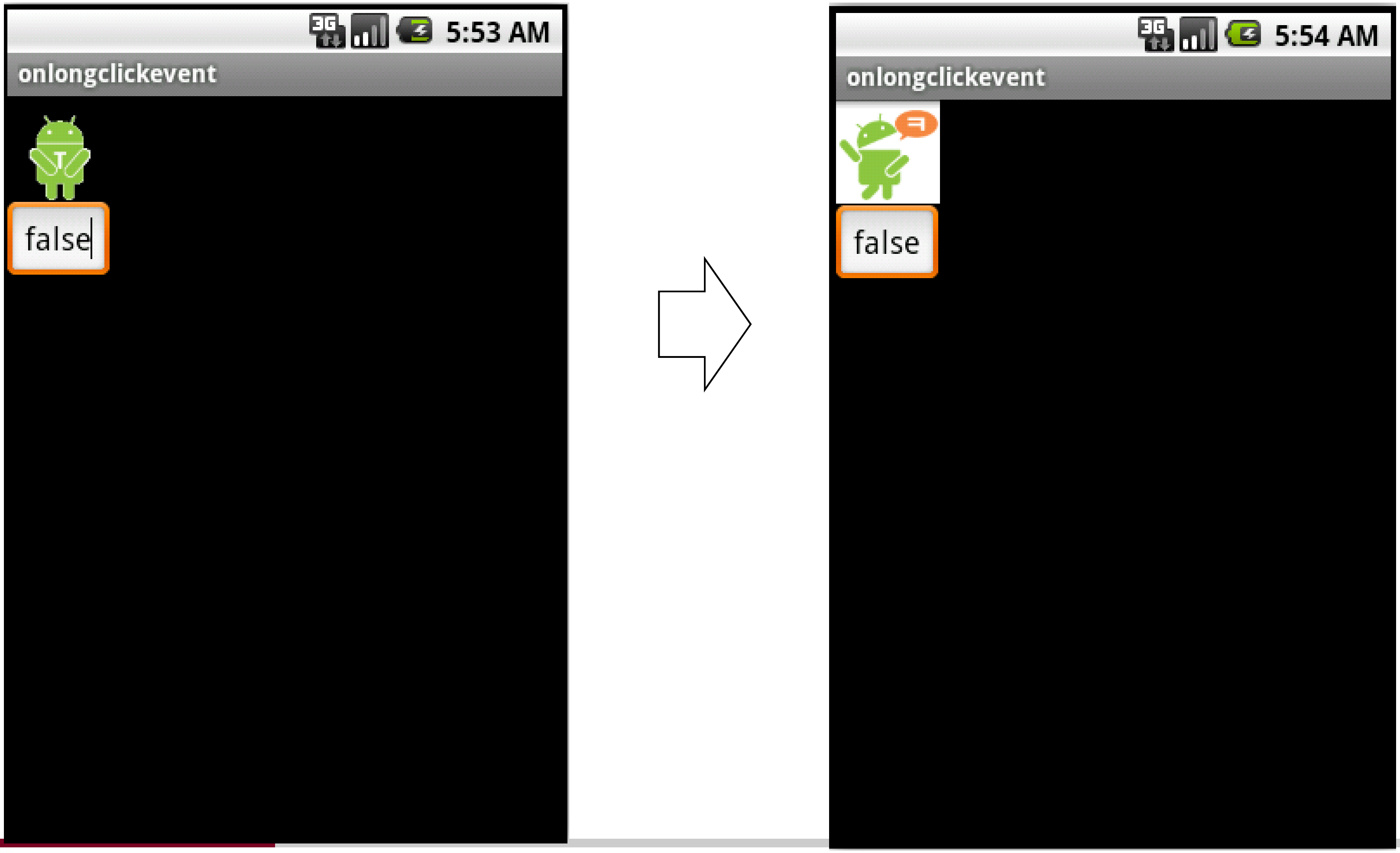
```
public class onkeyevent extends Activity {
    /** Called when the activity is first created. */

    private boolean clear = false;
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);
        final EditText et = (EditText)findViewById(R.id.EditText01);
        et.setOnKeyListener(new OnKeyListener(){

                @Override
                public boolean onKey(View v, int keyCode, KeyEvent event) {
                    // TODO Auto-generated method stub
                    showTempMag("디바이스 key가 눌러졌습니다");
                    if(clear == false){
                        et.setText("");
                        clear = true;
                    }
                    return false;
                }});
    }
    private void showTempMag(String strData){
     Toast tmpToast = Toast.makeText(this, strData, Toast.LENGTH_SHORT);
     tmpToast.show();
    }
}
```

↑

Toast.LENGTH_LONG

View 공통 Events

❖ View.OnLongClickListener.



View 공통 Events

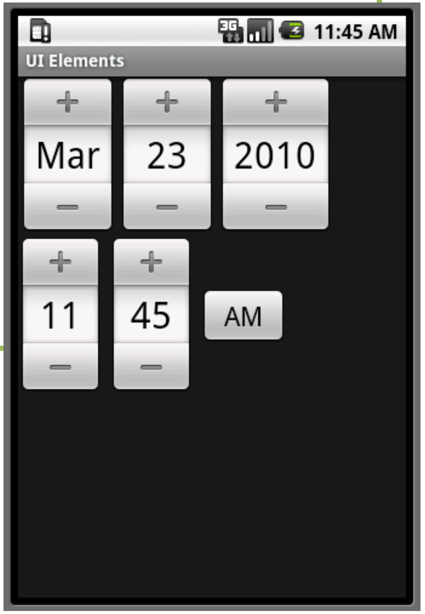
```
public class onlongclickevent extends Activity {
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);

        ImageView iv = (ImageView)findViewById(R.id.ImageView01);
        iv.setOnLongClickListener(new OnLongClickListener(){

               @Override
               public boolean onLongClick(View v) {
                    changeImg();
                    return false;
               }});

        EditText et = (EditText)findViewById(R.id.EditText01);
        et.setOnLongClickListener(new OnLongClickListener(){

               @Override
               public boolean onLongClick(View v) {
                         showTempMsg("Long Click event Test");
                    return false;
               }});
    }
     private void showTempMsg(String strData){
     Toast tmpToast = Toast.makeText(this, strData, Toast.LENGTH_SHORT);
     tmpToast.show();
    }
     private void changeImg(){
          ImageView iv = (ImageView)findViewById(R.id.ImageView01);
          iv.setBackgroundResource(R.drawable.after_loang_click);// TODO Auto-generated
method stub
    }
}
```

고급 위젯 : Picker

❖ DatePicker와 TimePicker

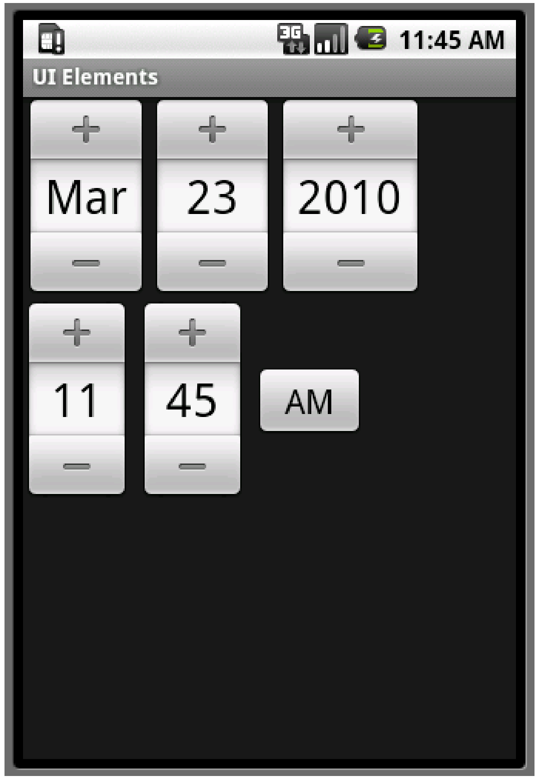
picker.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
        android:id="@+id/LinearLayout01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        xmlns:android="http://schemas.android.com/apk/res/android"
        android:orientation="vertical">
        <DatePicker
                android:id="@+id/DatePicker01"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"></DatePicker>
        <TimePicker
                android:id="@+id/TimePicker01"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"></TimePicker>
        <TextView
                android:id="@+id/text_datetime"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"></TextView>
</LinearLayout
```



고급 위젯 : Picker

❖ DatePicker

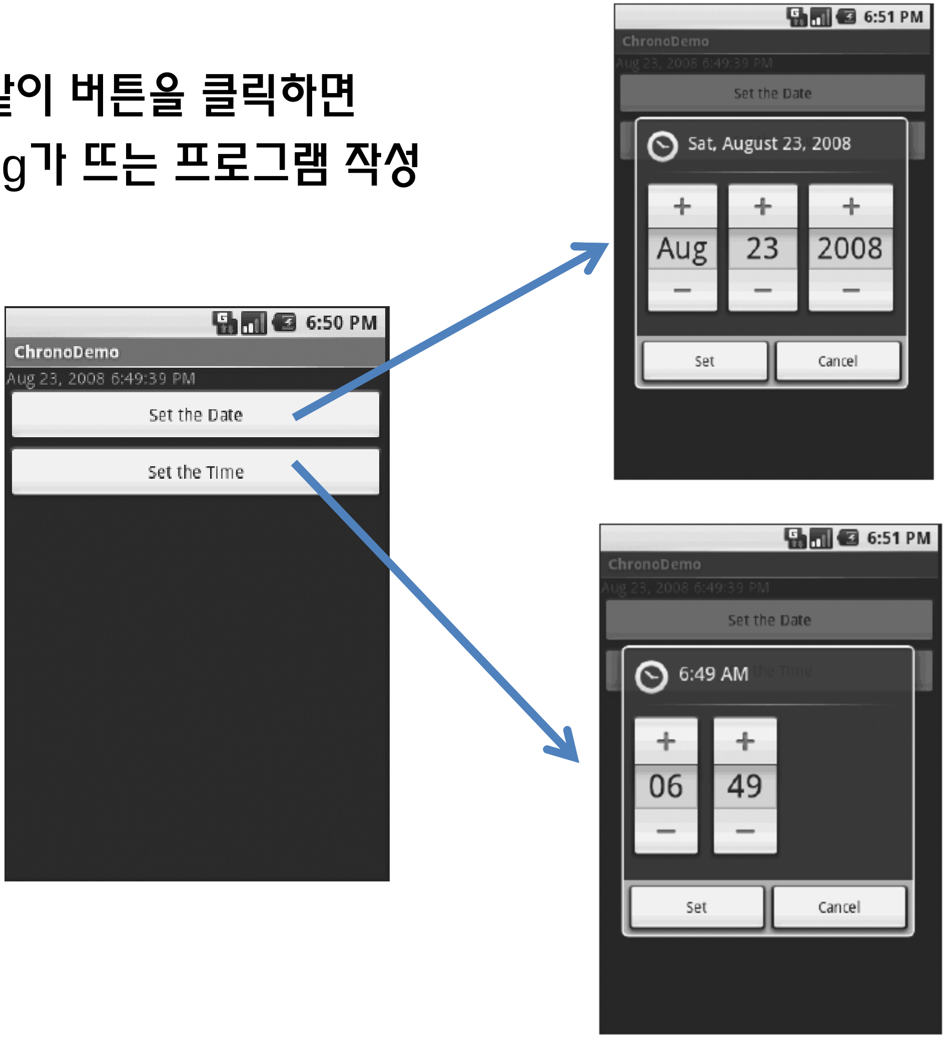


```
public class Pickers extends Activity {

@Override
protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        setContentView(R.layout.pickers);

        final TextView text =(TextView)findViewById(R.id.text_datetime);
        final DatePicker date = (DatePicker)findViewById(R.id.DatePicker01);
        final TimePicker time = (TimePicker)findViewById(R.id.TimePicker01);

        time.setOnTimeChangedListener(new TimePicker.OnTimeChangedListener(){

                public void onTimeChanged(TimePicker view, int hourOfDay, int minute) {

                Date dt = new Date(date.getYear(), date.getMonth(), date.getDayOfMonth(),
                hourOfDay, minute);
                text.setText(dt.toString());
        }
});
        date.init(date.getYear(), date.getMonth(), date.getDayOfMonth(),
                 new DatePicker.OnDateChangedListener() {

                        public void onDateChanged(DatePicker view, int year,
                        int monthOfYear, int dayOfMonth) {

                        Date dt = new Date(year-1900, monthOfYear, dayOfMonth,
                        time.getCurrentHour(), time.getCurrentMinute());
                        text.setText(dt.toString());
                }

        });
}
}
```

고급 위젯 : Picker

❖ Picker 예제

- ✓ 다음 그림과 같이 버튼을 클릭하면
- ✓ Picker dialog가 뜨는 프로그램 작성



고급 위젯 : Picker

❖ Picker 예제

xml

```
<LinearLayout
        android:orientation="vertical"
        android:layout_width="fill_parent"
        android:layout_height="fill_parent"
        >
<TextView android:id="@+id/dateAndTime"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        />
<Button android:id="@+id/dateBtn"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Set the Date"
        />
<Button android:id="@+id/timeBtn"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Set the Time"
        />
</LinearLayout>
```

java

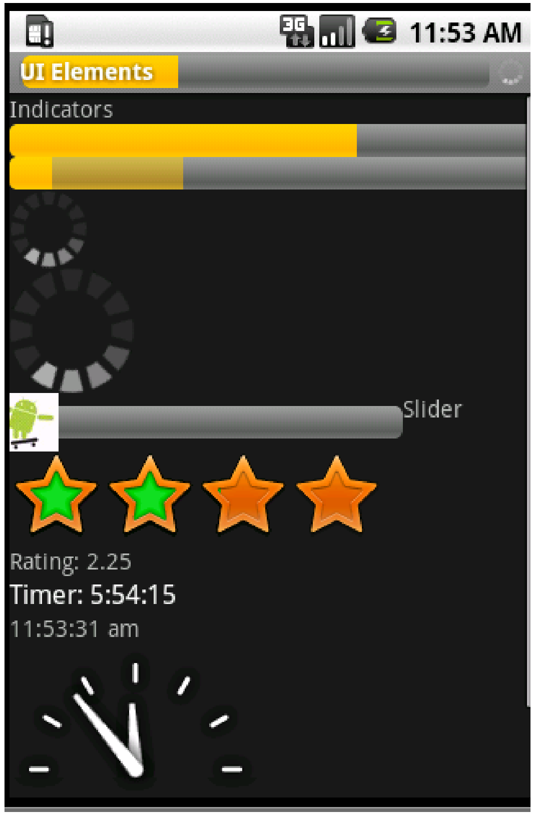
```
public class ChronoDemo extends Activity {
        DateFormat fmtDateAndTime=DateFormat.getDateTimeInstance();
        TextView dateAndTimeLabel;
        Calendar dateAndTime=Calendar.getInstance();
        DatePickerDialog.OnDateSetListener d=new DatePickerDialog.OnDateSetListener() {
                public void onDateSet(DatePicker view, int year, int monthOfYear,
                int dayOfMonth) {
                        dateAndTime.set(Calendar.YEAR, year);
                        dateAndTime.set(Calendar.MONTH, monthOfYear);
                        dateAndTime.set(Calendar.DAY_OF_MONTH, dayOfMonth);
                        updateLabel();
                }
   };
        TimePickerDialog.OnTimeSetListener t=new TimePickerDialog.OnTimeSetListener() {
                public void onTimeSet(TimePicker view, int hourOfDay,
                int minute) {
                dateAndTime.set(Calendar.HOUR_OF_DAY, hourOfDay);
                dateAndTime.set(Calendar.MINUTE, minute);
                updateLabel();
        }
   };
@Override
        public void onCreate(Bundle icicle) {
                super.onCreate(icicle);
                setContentView(R.layout.main);
                Button btn=(Button)findViewById(R.id.dateBtn);
                btn.setOnClickListener(new View.OnClickListener() {
                        public void onClick(View v) {
                        new DatePickerDialog(ChronoDemo.this,
                        d,
                        dateAndTime.get(Calendar.YEAR),
                        dateAndTime.get(Calendar.MONTH),
                        dateAndTime.get(Calendar.DAY_OF_MONTH)).show();
                        }
                });
```

고급 위젯 : Picker

```
btn=(Button)findViewById(R.id.timeBtn);
btn.setOnClickListener(new View.OnClickListener() {
        public void onClick(View v) {
        new TimePickerDialog(ChronoDemo.this,
        t,
        dateAndTime.get(Calendar.HOUR_OF_DAY),
        dateAndTime.get(Calendar.MINUTE),
        true).show();
        }
        });
dateAndTimeLabel=(TextView)findViewById(R.id.dateAndTime);
updateLabel();
private void updateLabel() {
        dateAndTimeLabel.setText(fmtDateAndTime
        .format(dateAndTime.getTime()));
        }
}
```

고급 위젯 : Indicator

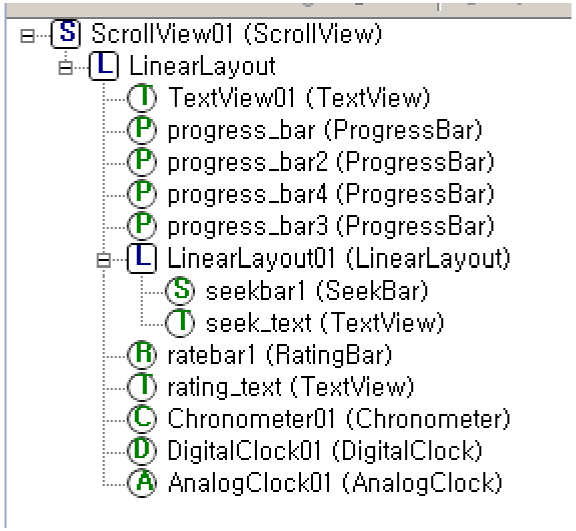
❖ ProgressBar



Rating: 2.25

Timer: 5:54:15

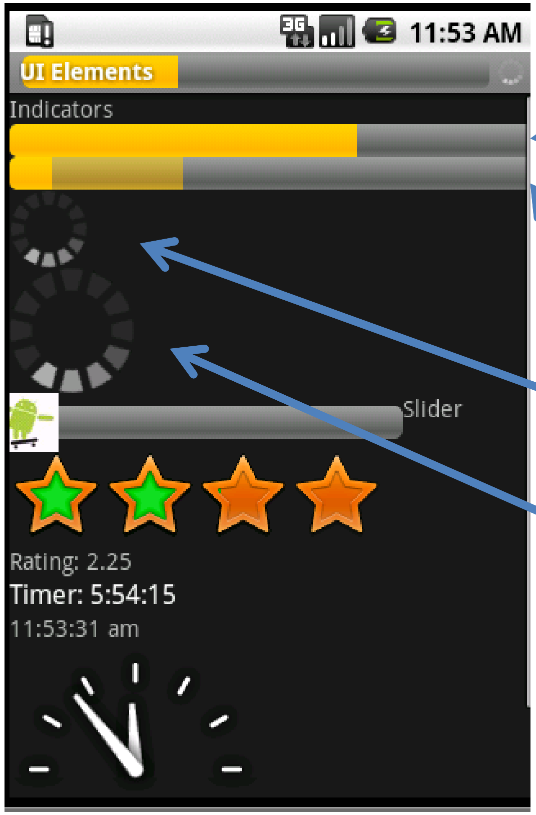
11:53:31 am



```
⊟ S ScrollView01 (ScrollView)
   ⊟ L LinearLayout
       T TextView01 (TextView)
       P progress_bar (ProgressBar)
       P progress_bar2 (ProgressBar)
       P progress_bar4 (ProgressBar)
       P progress_bar3 (ProgressBar)
     ⊟ L LinearLayout01 (LinearLayout)
           S seekbar1 (SeekBar)
           T seek_text (TextView)
       R ratebar1 (RatingBar)
       T rating_text (TextView)
       C Chronometer01 (Chronometer)
       D DigitalClock01 (DigitalClock)
       A AnalogClock01 (AnalogClock)
```

고급 위젯 : Indicator

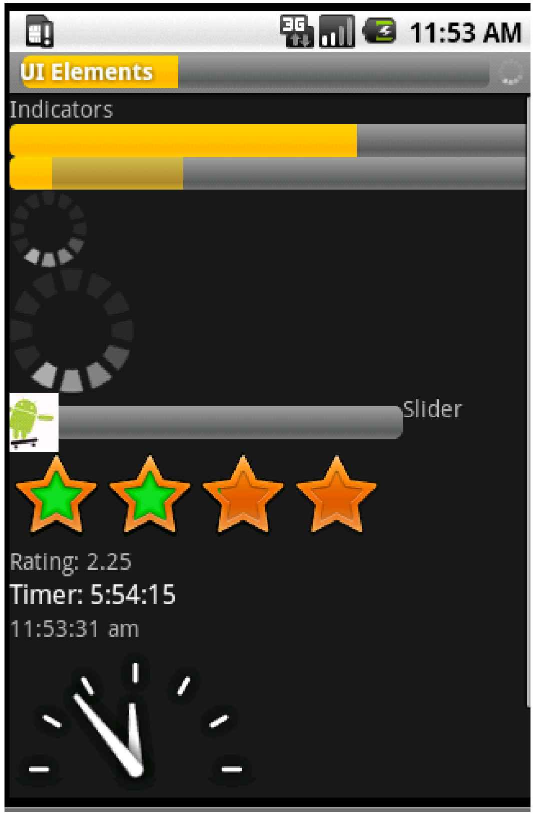
❖ ProgressBar



```
<ProgressBar
        android:id="@+id/progress_bar"
        style="?android:attr/progressBarStyleHorizontal"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:max="100" />
<ProgressBar
        android:id="@+id/progress_bar2"
        style="?android:attr/progressBarStyleHorizontal"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:max="100" />
<ProgressBar
        android:id="@+id/progress_bar4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" />
<ProgressBar
        android:id="@+id/progress_bar3"
        style="?android:attr/progressBarStyleLarge"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" />
```

고급 위젯 : Indicator

❖ Thread를 이용해 ProgressBar 표시

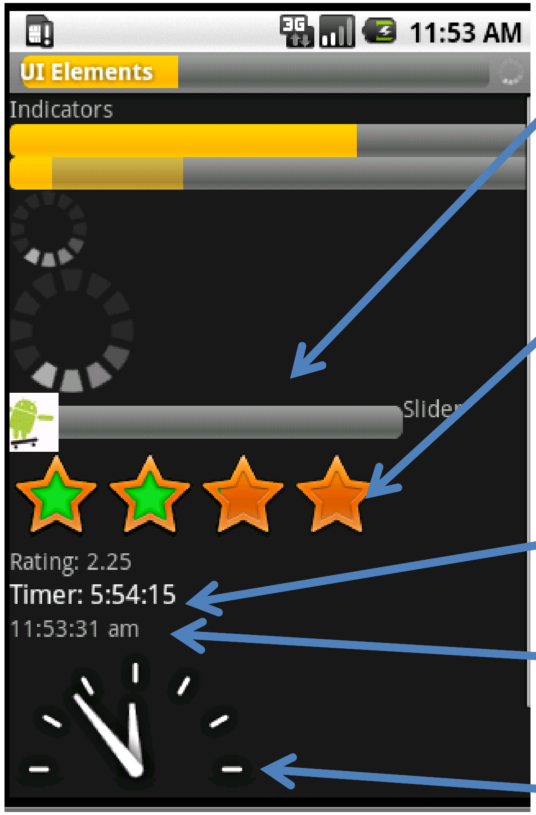


Rating: 2.25
Timer: 5:54:15
11:53:31 am

```
mProgress = (ProgressBar) findViewById(R.id.progress_bar);

// Start lengthy operation in a background thread
new Thread(new Runnable() {
    public void run() {
        while (mProgressStatus < 100) {
            try {
                synchronized (this) {
                    wait(50);
                }
            } catch (Exception e) {
                Log.e(ViewsMenu.debugTag, "wait failed", e);
            }
            mProgressStatus++;

            // Update the progress bar
            mHandler.post(new Runnable() {
                public void run() {
                    mProgress.setProgress(mProgressStatus);
                }
            });
        }
    }
}).start();
```

고급 위젯 : Indicator

❖ SeekBar 와 RatingBar



UI Elements

Indicators

Rating: 2.25

Timer: 5:54:15

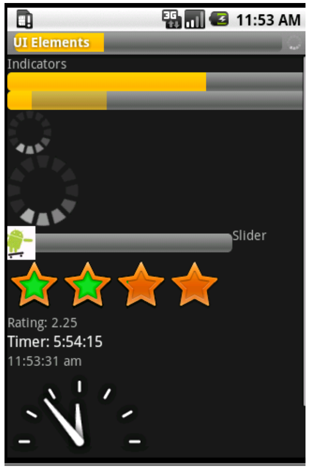
11:53:31 am

```
<SeekBar
        android:id="@+id/seekbar1"
        android:layout_height="wrap_content"
        android:layout_width="240px"
        android:max="512"
android:thumb="@drawable/droid" />
<RatingBar
        android:id="@+id/ratebar1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:numStars="4"
        android:stepSize="0.25" android:focusable="true"
        android:focusableInTouchMode="true"
        android:soundEffectsEnabled="true"></RatingBar>
<TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/rating_text"></TextView>
<Chronometer
        android:id="@+id/Chronometer01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:format="Timer: %s" android:focusable="false"
        android:focusableInTouchMode="false"></Chronometer>
<DigitalClock
        android:id="@+id/DigitalClock01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"></DigitalClock>
<AnalogClock
        android:id="@+id/AnalogClock01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"></AnalogClock>
```

고급 위젯 : Indicator

❖ SeekBar 구현

```
<SeekBar
        android:id="@+id/seekbar1"
        android:layout_height="wrap_content"
        android:layout_width="240px"
        android:max="512"
android:thumb="@drawable/droid" />
```



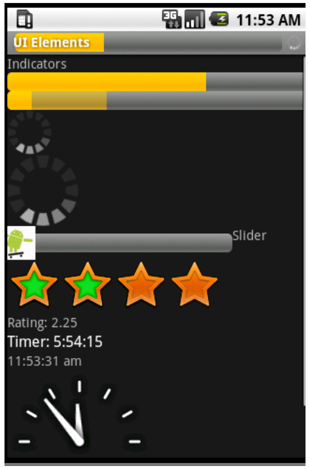
```
SeekBar seek = (SeekBar) findViewById(R.id.seekbar1);
seek.setOnSeekBarChangeListener(new SeekBar.OnSeekBarChangeListener() {

    public void onProgressChanged(SeekBar seekBar, int progress,
            boolean fromTouch) {

        Log.d(ViewsMenu.debugTag, "progress = " + progress + " fromTouch = " + fromTouch);
        ((TextView)findViewById(R.id.seek_text))
            .setText("Value: "+progress);

        seekBar.setSecondaryProgress((progress+seekBar.getMax())/2);

    }

    public void onStartTrackingTouch(SeekBar seekBar) {
        // TODO Auto-generated method stub

    }

    public void onStopTrackingTouch(SeekBar seekBar) {
        // TODO Auto-generated method stub

    }

});
```

고급 위젯 : Indicator

❖ RatingBar 구현

```
<RatingBar
android:id="@+id/ratebar1"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:numStars="4"
android:stepSize="0.25"
android:focusable="true"
android:focusableInTouchMode="true"
android:soundEffectsEnabled="true">
</RatingBar>
```

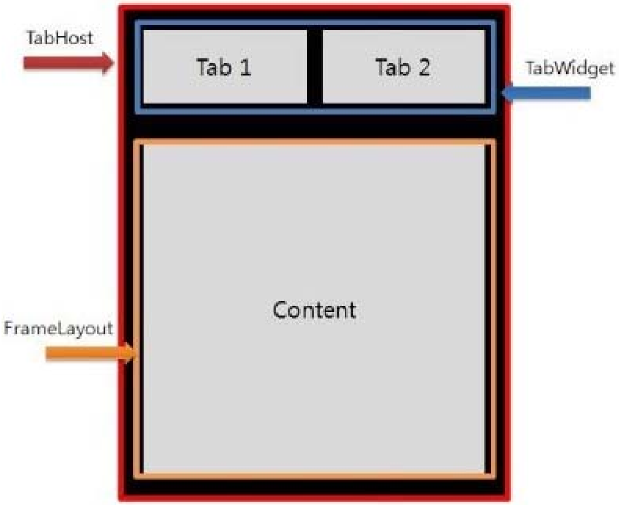
```
RatingBar rate = (RatingBar) findViewById(R.id.ratebar1);
rate.setOnRatingBarChangeListener(new RatingBar.OnRatingBarChangeListener() {

    public void onRatingChanged(RatingBar ratingBar, float rating,
            boolean fromTouch) {
        Log.d(ViewsMenu.debugTag, "rating = " + rating + " fromTouch = " + fromTouch);
        ((TextView)findViewById(R.id.rating_text)).setText("Rating: "+ rating);
    }
});
```



고급 위젯 : Tab

❖ 탭 구성요소

- ✓ TabHost 클래스 : 탭 버튼과 내용을 포함하는 탭 컨테이너
- ✓ TabWidget 클래스 : 탭 버튼 목록을 관리. 아이콘 설정 가능
- ✓ FrameLayout : 탭 내용을 관리



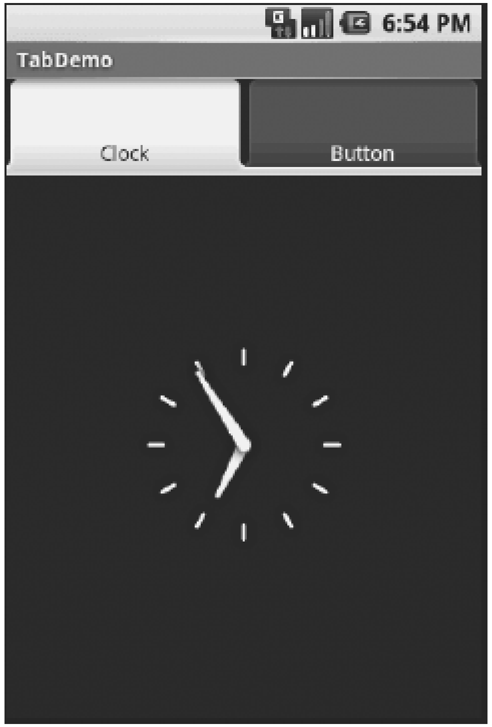
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
        android:orientation="vertical"
        android:layout_width="fill_parent"
        android:layout_height="fill_parent">
        <TabHost android:id="@+id/tabhost"
        android:layout_width="fill_parent"
        android:layout_height="fill_parent">
                <TabWidget android:id="@android:id/tabs"
                android:layout_width="fill_parent"
                android:layout_height="wrap_content"
                />
                <FrameLayout android:id="@android:id/tabcontent"
                android:layout_width="fill_parent"
                android:layout_height="fill_parent"
                android:paddingTop="62px">
                <AnalogClock android:id="@+id/tab1"
                android:layout_width="fill_parent"
                android:layout_height="fill_parent"
                android:layout_centerHorizontal="true"
                />
                <Button android:id="@+id/tab2"
                android:layout_width="fill_parent"
                android:layout_height="fill_parent"
                android:text="A semi-random button"
                />
                </FrameLayout>
        </TabHost>
</LinearLayout>
```

TabWidget의 id는
항상 "@android:id/tabs“이어야함
FrameLayout의 id는
항상 “@android:id/tabcontent”

고급 위젯 : Tab

❖ 간단한 Tab 예제

```
import android.app.Activity;
import android.os.Bundle;
import android.widget.TabHost;
public class TabDemo extends Activity {
        @Override
        public void onCreate(Bundle icicle) {
                super.onCreate(icicle);
                setContentView(R.layout.main);
                TabHost tabs=(TabHost)findViewById(R.id.tabhost);
                tabs.setup();

                TabHost.TabSpec spec=tabs.newTabSpec("tag1");
                spec.setContent(R.id.tab1);
                spec.setIndicator("Clock");
                tabs.addTab(spec);

                spec=tabs.newTabSpec("tag2");
                spec.setContent(R.id.tab2);
                spec.setIndicator("Button");
                tabs.addTab(spec);

                tabs.setCurrentTab(0);
        }
}
```

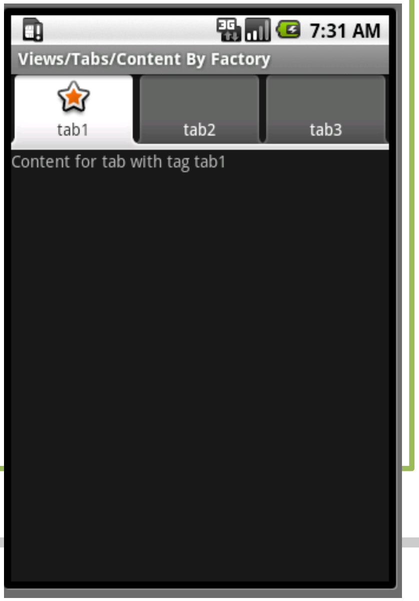


고급 위젯 : Tab

❖ Tab을 생성하는 또다른 방법

icon 설정

```
public class Tabs1 extends TabActivity {

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      TabHost tabHost = getTabHost();

      LayoutInflater.from(this).inflate(R.layout.tabs1, tabHost.getTabContentView(), true);

      tabHost.addTab(tabHost.newTabSpec("tab1")
              .setIndicator("tab1")
              .setContent(R.id.view1));
      tabHost.addTab(tabHost.newTabSpec("tab3")
              .setIndicator("tab2")
              .setContent(R.id.view2));
      tabHost.addTab(tabHost.newTabSpec("tab3")
              .setIndicator("tab3")
              .setContent(R.id.view3));
   }
}
```



Content for tab with tag tab1

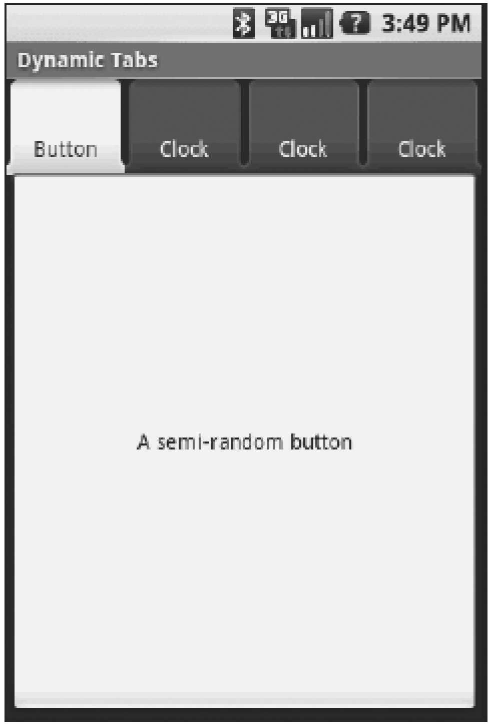
```
<FrameLayout
   android:layout_width="fill_parent"
   android:layout_height="fill_parent">

   <TextView android:id="@+id/view1"
      android:background="@drawable/blue"
      android:layout_width="fill_parent"
      android:layout_height="fill_parent"
      android:text="@string/tabs_1_tab_1"/>

   <TextView android:id="@+id/view2"
      android:background="@drawable/red"
      android:layout_width="fill_parent"
      android:layout_height="fill_parent"
      android:text="@string/tabs_1_tab_2"/>

   <TextView android:id="@+id/view3"
      android:background="@drawable/green"
      android:layout_width="fill_parent"
      android:layout_height="fill_parent"
      android:text="@string/tabs_1_tab_3"/>

</FrameLayout>
```

고급 위젯 : Tab

❖ 동적으로 Tab 생성하기

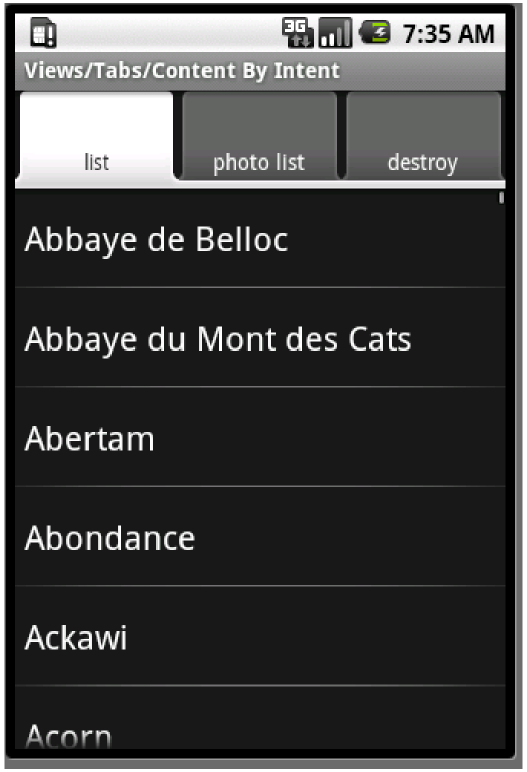
- ✓ 버튼을 누르면 Tab을 생성

```
Button btn=(Button)tabs.getCurrentView().findViewById(R.id.buttontab);
btn.setOnClickListener(new View.OnClickListener() {
        public void onClick(View view) {
                TabHost.TabSpec spec=tabs.newTabSpec("tag1");
                spec.setContent(new TabHost.TabContentFactory() {
                        public View createTabContent(String tag) {
                                return(new AnalogClock(DynamicTabDemo.this));
                        }
                });
                spec.setIndicator("Clock");
                tabs.addTab(spec);
                }
                });
        }
}
```



고급 위젯 : Tab

❖ **예제**



7:35 AM

Views/Tabs/Content By Intent

list | photo list | destroy

Abbaye de Belloc

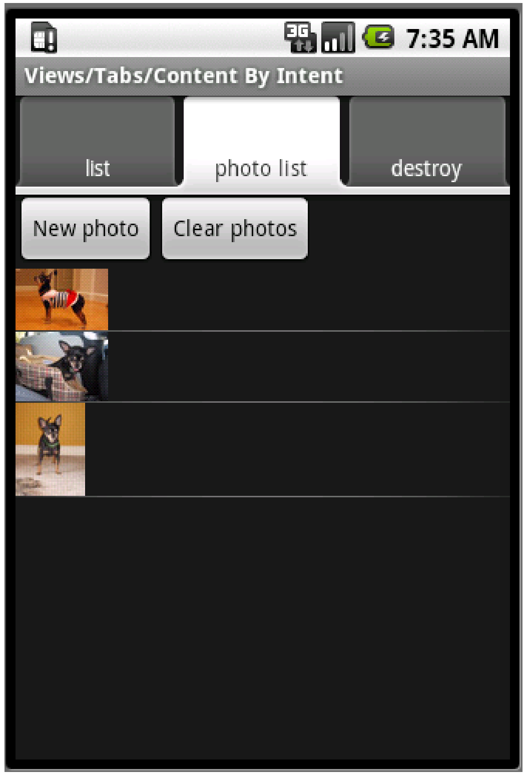
Abbaye du Mont des Cats

Abertam

Abondance

Ackawi

Acorn

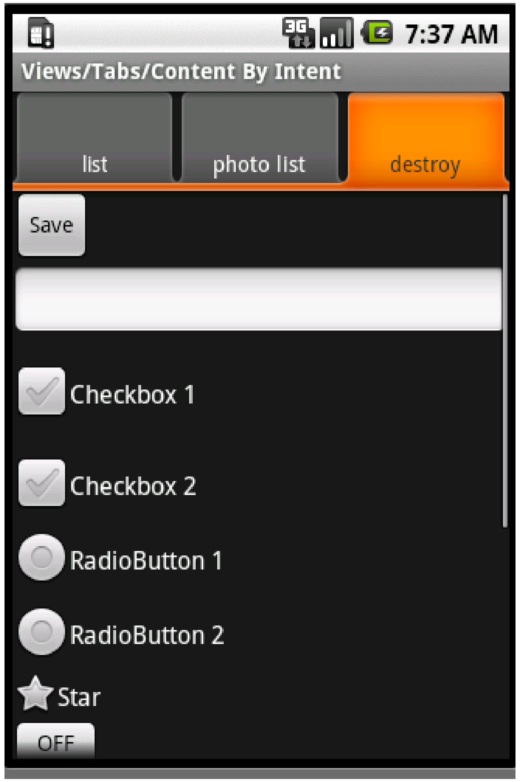


7:35 AM

Views/Tabs/Content By Intent

list | photo list | destroy

New photo | Clear photos



7:37 AM

Views/Tabs/Content By Intent

list | photo list | destroy

Save

☑ Checkbox 1

☑ Checkbox 2

○ RadioButton 1

○ RadioButton 2

☆ Star

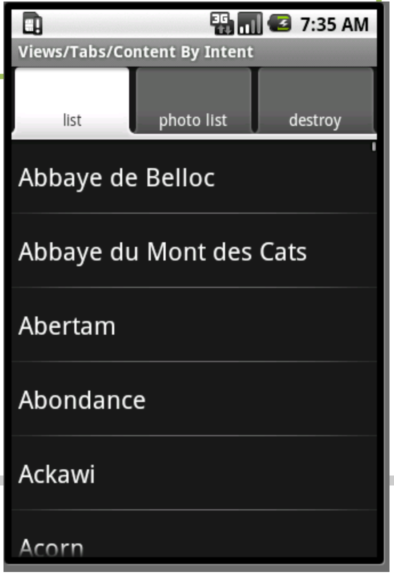
OFF

고급 위젯 : Tab

❖ Tab 예제

```
public class Tabs3 extends TabActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        final TabHost tabHost = getTabHost();

        tabHost.addTab(tabHost.newTabSpec("tab1")
                .setIndicator("list")
                .setContent(new Intent(this, List1.class)));

        tabHost.addTab(tabHost.newTabSpec("tab2")
                .setIndicator("photo list")
                .setContent(new Intent(this, List8.class)));

        // This tab sets the intent flag so that it is recreated each time
        // the tab is clicked.
        tabHost.addTab(tabHost.newTabSpec("tab3")
                .setIndicator("destroy")
                .setContent(new Intent(this, Controls2.class)
                        .addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP)));
    }
}
```

```
public class List1 extends ListActivity {

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        // Use an existing ListAdapter that will map an array
        // of strings to TextViews
        setListAdapter(new ArrayAdapter<String>(this,
                android.R.layout.simple_list_item_1, mStrings));
        getListView().setTextFilterEnabled(true);
    }

    private String[] mStrings = {
            "Abbaye de Belloc", "Abbaye du Mont des Cats", "Abertam",
"Abondance", "Ackawi",
            "Acorn", "Adelost", "Affidelice au Chablis", "Afuega'l Pitu",
"Airag", "Airedale“}
```



Views/Tabs/Content By Intent

Abbaye de Belloc

Abbaye du Mont des Cats

Abertam

Abondance

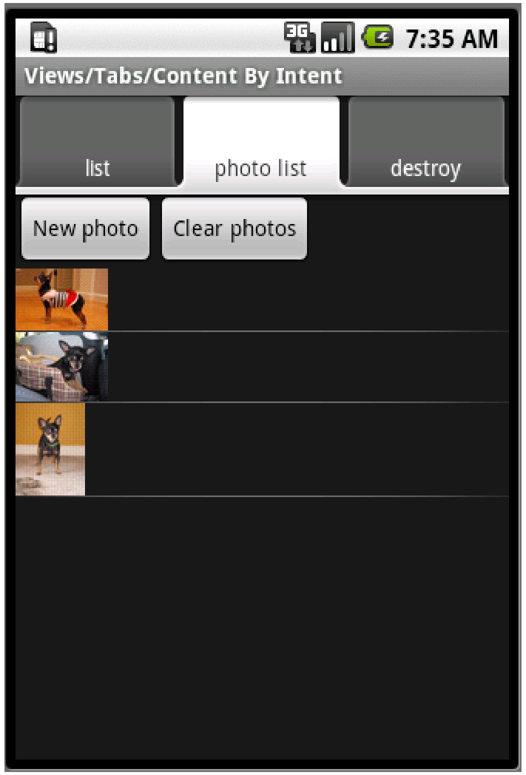
Ackawi

Acorn

고급 위젯 : Tab

❖ Tab 예제

```
public class List8 extends ListActivity {

    PhotoAdapter mAdapter;

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        // Use a custom layout file
        setContentView(R.layout.list_8);

        // Tell the list view which view to display when the list is empty
        getListView().setEmptyView(findViewById(R.id.empty));

        // Set up our adapter
        mAdapter = new PhotoAdapter(this);
        setListAdapter(mAdapter);

        // Wire up the clear button to remove all photos
        Button clear = (Button) findViewById(R.id.clear);
        clear.setOnClickListener(new View.OnClickListener() {

            public void onClick(View v) {
                mAdapter.clearPhotos();
            } });

        // Wire up the add button to add a new photo
        Button add = (Button) findViewById(R.id.add);
        add.setOnClickListener(new View.OnClickListener() {

            public void onClick(View v) {
                mAdapter.addPhotos();
            } });
    }
```



고급 위젯 : Tab

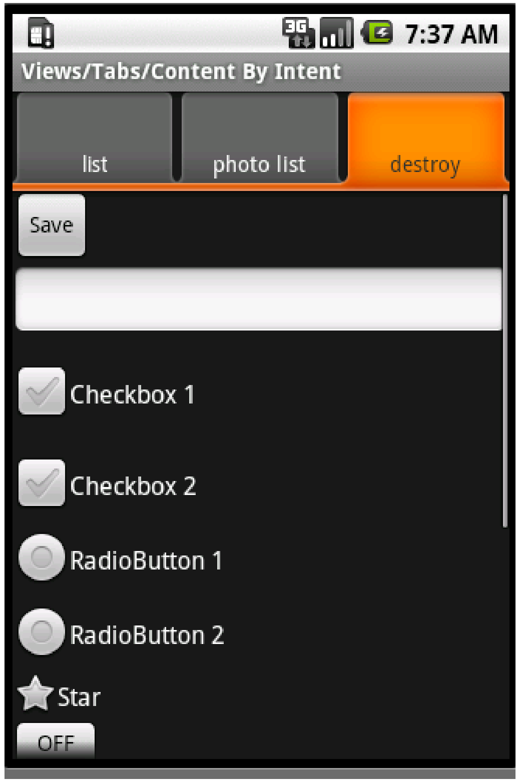
```
public class PhotoAdapter extends BaseAdapter {

    private Integer[] mPhotoPool = {
        R.drawable.sample_thumb_0, R.drawable.sample_thumb_1, R.drawable.sample_thumb_2,
        R.drawable.sample_thumb_3, R.drawable.sample_thumb_4, R.drawable.sample_thumb_5,
        R.drawable.sample_thumb_6, R.drawable.sample_thumb_7};

    private ArrayList<Integer> mPhotos = new ArrayList<Integer>();

    public PhotoAdapter(Context c) {
      mContext = c;
    }

    public int getCount() {
      return mPhotos.size();
    }

    public Object getItem(int position) {
      return position;
    }

    public long getItemId(int position) {
      return position;
    }

    public View getView(int position, View convertView, ViewGroup parent) {
      // Make an ImageView to show a photo
      ImageView i = new ImageView(mContext);

      i.setImageResource(mPhotos.get(position));
      i.setAdjustViewBounds(true);
      i.setLayoutParams(new AbsListView.LayoutParams(LayoutParams.WRAP_CONTENT,
          LayoutParams.WRAP_CONTENT));
      // Give it a nice background
      i.setBackgroundResource(R.drawable.picture_frame);
      return i;
    }
```

```
private Context mContext;

    public void clearPhotos() {
      mPhotos.clear();
      notifyDataSetChanged();
    }

    public void addPhotos() {
      int whichPhoto = (int)Math.round(Math.random() * (mPhotoPool.length - 1));
      int newPhoto = mPhotoPool[whichPhoto];
      mPhotos.add(newPhoto);
      notifyDataSetChanged();
    }

  }
}
```

고급 위젯 : Tab

❖ Tab 예제

```
public class Controls2 extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.controls_1);

        Spinner s1 = (Spinner) findViewById(R.id.spinner1);
        ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
                android.R.layout.simple_spinner_item, mStrings);
        adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
        s1.setAdapter(adapter);
    }

    private static final String[] mStrings = {
    "Mercury", "Venus", "Earth", "Mars", "Jupiter", "Saturn", "Uranus", "Neptune"
    };
}
```



LayoutInflater/inflate

❖ LayoutInflater의 개념

- ✓ Res아래의 XML파일들을 이용하여 View 객체들을 인스턴스화 하는 클래스

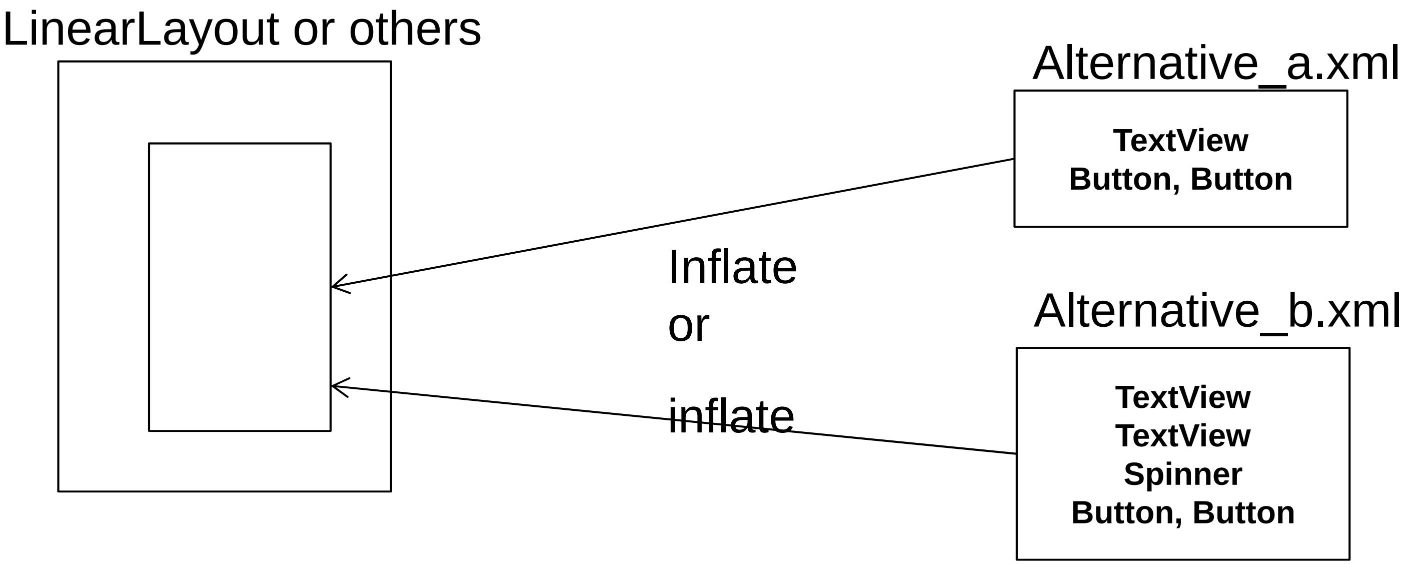
```
LayoutInflater inflater =
                    (LayoutInflater)getContext.getSystemService(Context.LAYOUT_INFLATER_SERVICE);
LinearLayout mainLayout = (LinearLayout)inflater.inflate( R.layout.main_layout, null );

setContentView(mainLayout);
```

- ✓ LayoutInflator를 생성하는 다른 방법

```
LayoutInflater inflater = Layoutinflater.from( this );

LayoutInflater inflater = getLayoutInflater(); ( @activity )
```

LayoutInflater/inflate

```
LayoutInflater inflater =
                    (LayoutInflater)getContext.getSystemService(Context.LAYOUT_INFLATER_SERVICE);
LinearLayout mainLayout = (LinearLayout)inflater.inflate( R.layout.main_layout, null );

ViewGroup alt = inflater.inflate( R.layout.alternative_a, null );
mainLayout.add( alt ) ;
setContentView(mainLayout);
```



LinearLayout or others

Alternative_a.xml

TextView
Button, Button

Inflate
or

inflate

Alternative_b.xml

TextView
TextView
Spinner
Button, Button

LayoutInflater/inflate

```
View inflate(int resource, ViewGroup root)
View inflate(XmlPullParser parser, ViewGroup root)
View inflate(XmlPullParser parser, ViewGroup root, boolean attachToRoot)
inflate(int resource, ViewGroup root, boolean attachToRoot)
```

LayoutInflater/inflate

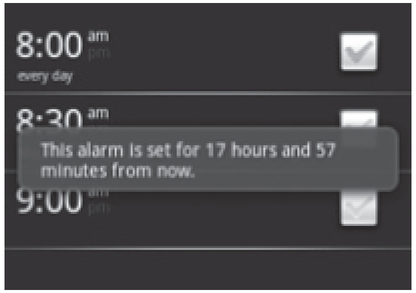
❖ 예 : Custom Dialog

```
public class AlertCustom extends Activity {
...
        @Override
        protected Dialog onCreateDialog(int id) {
                switch(id) {
                        case CUSTOM_DIALOG :
                                AlertDialog.Builder builder;
                                AlertDialog alertDialog;
                                LayoutInflater inflater =
                                (LayoutInflater)getSystemService(LAYOUT_INFLATER_SERVICE);
                                View layout = inflater.inflate(R.layout.custom_dialog,
                                                (ViewGroup) findViewById(R.id.layout_root));
                                TextView text = (TextView) layout.findViewById(R.id.text);
                                text.setText("Hello, this is a custom dialog!");
                                ImageView image = (ImageView) layout.findViewById(R.id.image);
                                image.setImageResource(R.drawable.icon);
                                builder = new AlertDialog.Builder(this);
                                builder.setView(layout);
                                alertDialog = builder.create();
                                return alertDialog;
                }
        return null;
        }
}
```

사용자에게 통보하기

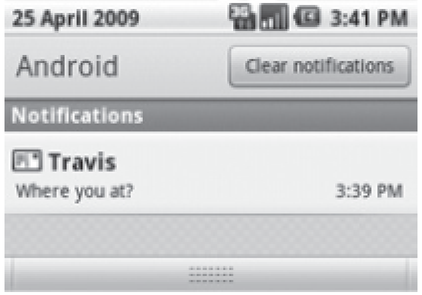
❖ Notification의 종류

- ✓ 토스트 노티피케이션(Toast Notification)
  - – 백그라운드로부터 오는 짧은 메시지를 위한 것.

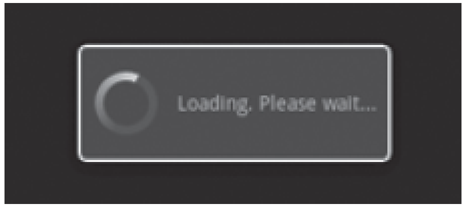


This alarm is set for 17 hours and 57 minutes from now.

- ✓ 상태바 노티피케이션(Status Bar Notification)
  - – 백그라운드로부터 와서 사용자에게 응답 요청을 지속적으로 상기reminder시키기 위한 것.
- ✓ 다이얼로그 노티피케이션(Dialog Notification)
  - – 액티비티와 관련된 노티피케이션



Travis
Where you at? 3:39 PM



Loading. Please wait...

사용자에게 통보하기

❖ Toast Notification

✓ 기본 구현 방법

```
Context context = getApplicationContext();
CharSequence text = “Hello toast!”;
int duration = Toast.LENGTH_SHORT;
Toast toast = Toast.makeText(context, text, duration);
toast.show();
```

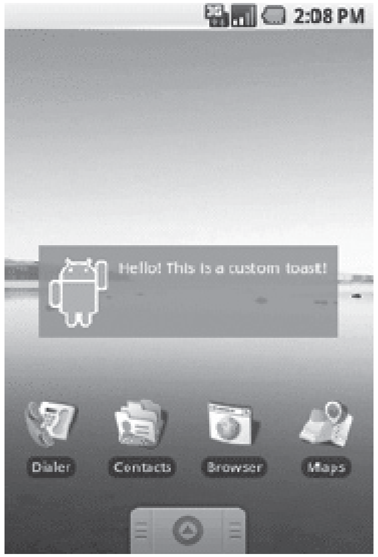
✓ 위치 지정하기

```
toast.setGravity(Gravity.TOP|Gravity.LEFT, 0, 0);
```

사용자에게 통보하기

❖ Custom Toast Notification 생성하기

✓ Icon 있는 Toast 생성하기



Hello! This is a custom toast!

```
<LinearLayout
        xmlns:android=”http://schemas.android.com/apk/res/android”
        android:id=”@+id/toast_layout_root”
        android:orientation=”horizontal”
        android:layout_width=”fill_parent”
        android:layout_height=”fill_parent”
        android:padding=”10dp”
        android:background=”#DAAA” >
        <ImageView android:id=”@+id/image”
                android:layout_width=”wrap_content”
                android:layout_height=”fill_parent”
                android:layout_marginRight=”10dp”
                />
        <TextView android:id=”@+id/text”
                android:layout_width=”wrap_content”
                android:layout_height=”fill_parent”
                android:textColor=”#FFF”
                />
</LinearLayout>
```

```
LayoutInflater inflater = getLayoutInflater();
View layout = inflater.inflate(R.layout.toast_layout,
    (ViewGroup) findViewById(R.id.toast_layout_root));

ImageView image = (ImageView) layout.findViewById(R.id.image);
image.setImageResource(R.drawable.android);
TextView text = (TextView) layout.findViewById(R.id.text);
text.setText(“Hello! This is a custom toast!”);

Toast toast = new Toast(getApplicationContext());
toast.setGravity(Gravity.CENTER_VERTICAL, 0, 0);
toast.setDuration(Toast.LENGTH_LONG);
toast.setView(layout);
toast.show();
```

사용자에게 통보하기

❖ Status Bar Notification 구현하기

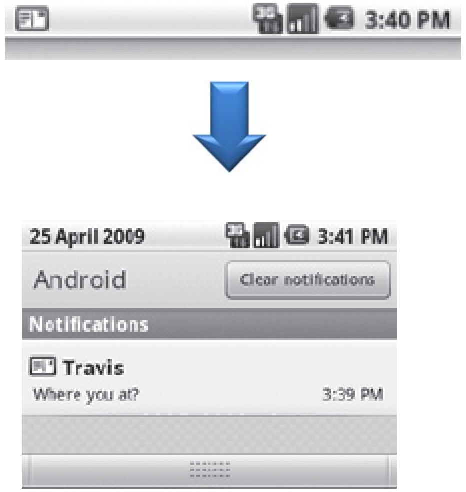
- ✓ 상태바 노티피케이션의 구현전 설계
  - – 상태 바에 대한 아이콘.
  - – 확장 뷰에 대한 타이틀과 확장 메시지(만약 여러분이 커스텀 확장 뷰를 정의하지 않는다면).
  - – 노티피케이션이 선택될 때 일어나도록 하기 위한 PendingIntent.
- ✓ 상태바 노티피케이션에 대한 선택적인 설정
  - – 상태바에 대한 조회 텍스트(ticker-text) 메시지
  - – 경보 사운드
  - – 진동 설정
  - – 발광 LED 설정

사용자에게 통보하기

❖ Status Bar Notification 구현하기

✓ 시스템으로 부터 NotificationManager 획득

```
String ns = Context.NOTIFICATION_SERVICE;
NotificationManager mNotificationManager = (NotificationManager)getSystemService(ns);
```



✓ Notification을 생성

```
int icon = R.drawable.notification_icon;
CharSequence tickerText = “Hello”;
long when = System.currentTimeMillis();
Notification notification = new Notification(icon, tickerText, when);
```

✓ 확장 메시지와 Intent를 정의하라

```
Context context = getApplicationContext();
CharSequence contentTitle = “My notification”;
CharSequence contentText = “Hello World!”;
Intent notificationIntent = new Intent(this, MyClass.class);
PendingIntent contentIntent = PendingIntent.getActivity(this, 0, notificationIntent, 0);
notification.setLatestEventInfo(context, contentTitle,contentText, contentIntent);
```

✓ Notification 전달

```
private static final int HELLO_ID = 1;
mNotificationManager.notify(HELLO_ID, notification);
```

사용자에게 통보하기

❖ Status Bar Notification 구현확장

- ✓ Sound를 추가하기
  - – default를 확장

```
notification.defaults |= Notification.DEFAULT_SOUND;
```

  - – SD카드의 사운드를 지정

```
notification.sound = Uri.parse(“file:///sdcard/notification/ringer.mp3”);
```

  - – mediaStore 컨텐트 프로바이더에서 지정

```
notification.sound = Uri.withAppendedPath(Audio.Media.INTERNAL_CONTENT_URI, “6”);
```

- ✓ 진동을 추가하기

```
long[] vibrate = {0,100,200,300};
notification.vibrate = vibrate;
```

사용자에게 통보하기

❖ Status Bar Notification 구현확장

- ✓ Flashing Lights를 추가하기

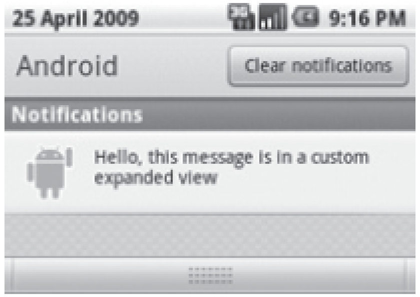
```
notification.defaults |= Notification.DEFAULT_LIGHTS;

notification.ledARGB = 0xff00ff00;
notification.ledOnMS = 300;
notification.ledOffMS = 1000;
notification.flags |= Notification.FLAG_SHOW_LIGHTS;
```

사용자에게 통보하기

❖ Status Bar Notification 구현확장

✓ Custom View로 확장하기

```
<LinearLayout
        xmlns:android=”http://schemas.android.com/apk/res/android”
        android:orientation=”horizontal”
        android:layout_width=”fill_parent”
        android:layout_height=”fill_parent”
        android:padding=”3dp”
        >
        <ImageView android:id=”@+id/image”
                android:layout_width=”wrap_content”
                android:layout_height=”fill_parent”
                android:layout_marginRight=”10dp” />
        <TextView android:id=”@+id/text”
                android:layout_width=”wrap_content” android:layout_height=”fill_parent”
                android:textColor=”#000”
                />
</LinearLayout>
```



Hello, this message is in a custom expanded view

✓ RemoteView로 설정

```
RemoteViews contentView = new RemoteViews(getPackageName(),
R.layout.custom_notification_layout);
contentView.setImageViewResource(R.id.image,
R.drawable.notification_image);
contentView.setTextViewText(R.id.text, “Hello, this message is in a custom expanded view”);
notification.contentView = contentView;
```

사용자에게 통보하기

❖ Status Bar Notification 구현확장

- ✓ Intent 설정

```
Intent notificationIntent = new Intent(this, MyClass.class);
PendingIntent contentIntent = PendingIntent.getActivity(this, 0, notificationIntent,0);
notification.contentIntent = contentIntent;
```