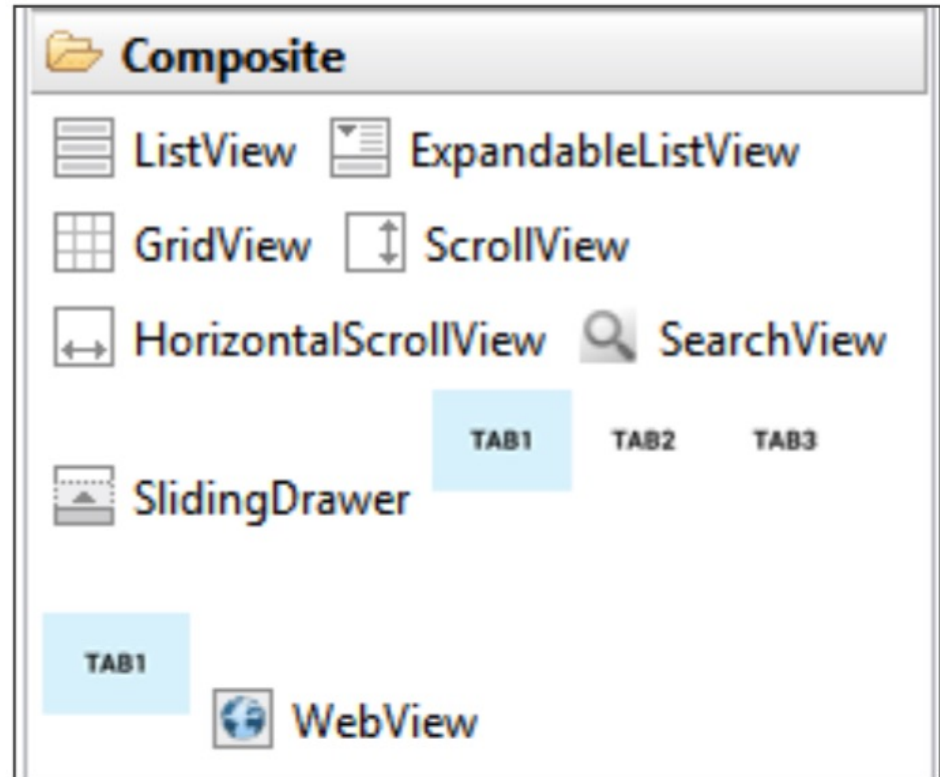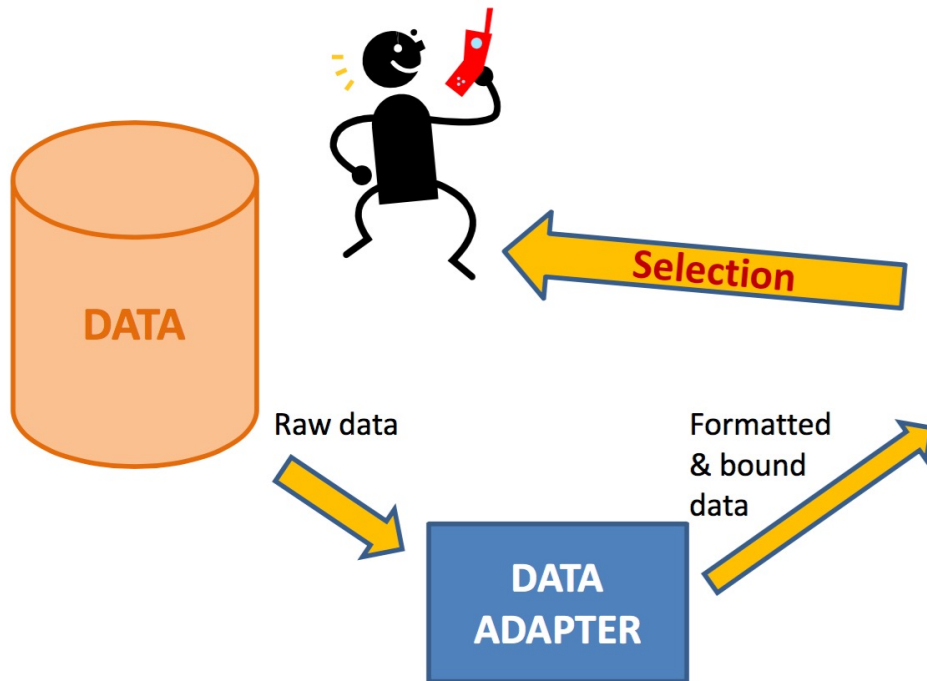# List-Based Widgets

List-Based Widgets

- **RadioButtons** and **CheckButtons** are widgets suitable for selecting options offered by a *small* set of choices.

- When the set of values to choose from is large, other Android **List-Based Widgets** are more appropriate.

- Example of **List-Based Widgets** include:
  - *ListViews,*
  - *RecyclerView*
  - *Spinner,*
  - *GridView*
  - *Image Gallery*
  - *ScrollViews*, etc.

📁 **Composite**

▤ ListView   ▦ ExpandableListView

▦ GridView   ↕ ScrollView

↔ HorizontalScrollView   🔍 SearchView

TAB1   TAB2   TAB3

▤ SlidingDrawer

TAB1

🌐 WebView

List-Based Widgets

- The Android **DataAdapter** class is used to feed a collection of data items to a *List-Based Widget.*
- The *Adapter 's* raw data may come from a variety of sources, such as small arrays as well as large databases.
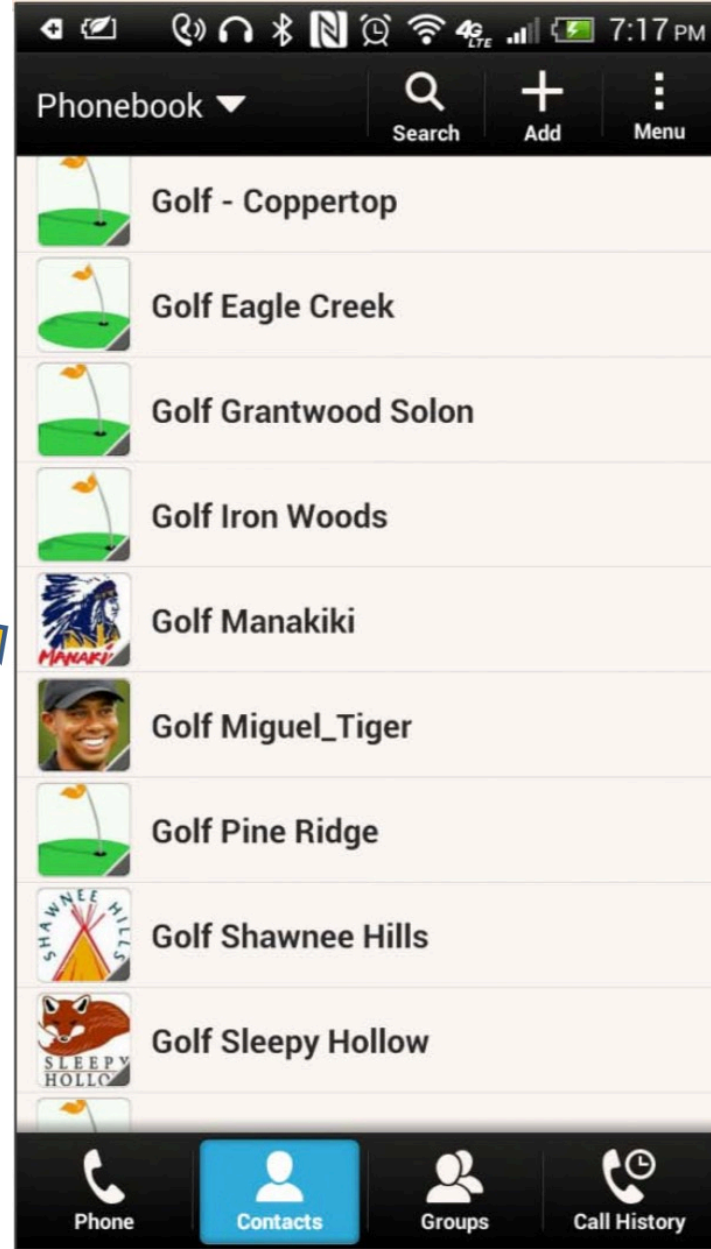
Destination layout Holding a ListView

List-Based App = ListView + Data + DataAdapter

- An **ArrayAdapter<T>** accepts for input an **array** (or **ArrayList**) of objects of some arbitrary type T.
- The adapter works on each object by
  - (a) applying its **toString()** method, and
  - (b) moving its formatted output string to a **TextView**.
- The formatting operation is guided by a user supplied XML layout specification which defines the appearance of the receiving TextView.

List-Based App = ListView + Data + DataAdapter

```java
class Student {
    String id;
    String name;

    @override
    public String toString() {
        return this.id + " - " + this.name;
    }
}
```

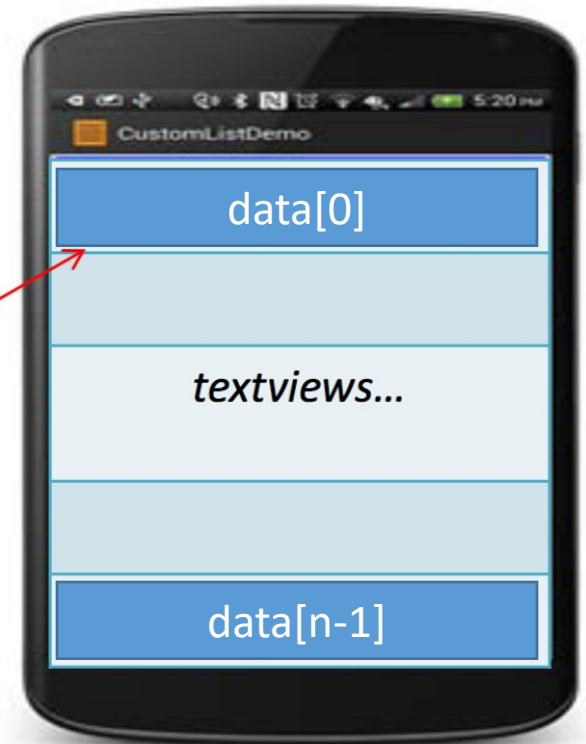| T	ArrayAdapter<T>	Data
T = String	ArrayAdapter<String>	ArrayList<String>
T = Student	ArrayAdapter<Student>	ArrayList<Student>

List-Based App = ListView + Data + DataAdapter

String[] data = new String[] { "str1", "str2", ... };

ArrayAdapter<String>

CustomListDemo

data[0]

textviews...

data[n-1]

Input XML Specification

```xml
<?xml version="1.0" encoding="utf-8"?>
<TextView
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    ...
/>
```
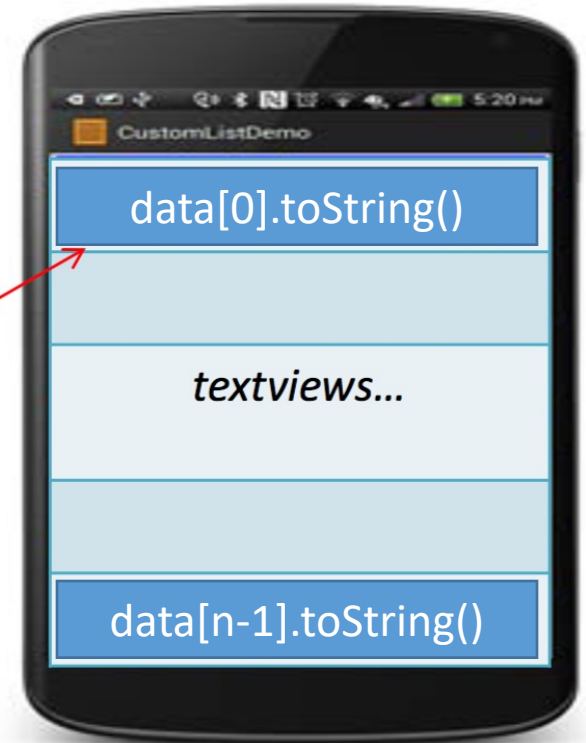
List-Based App = ListView + Data + DataAdapter

Student[] data = new Student[] { object1, ... };

ArrayAdapter<Student>

data[0].toString()

textviews...

data[n-1].toString()

Input XML Specification

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

ArrayAdapter<T>: T = String

```java
String[] data;
ArrayAdapter<String> adapter;
ListView listView;
```

```java
listView = findViewById(R.id.listview);

data = new String[] {"item 1", "item 2", "item 3", ... };

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

listView.setAdapter(adapter);
```

ListView: *simple_list_item_1*

simple_list_item1.xml

```xml
<TextView xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@android:id/text1"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:textAppearance="?android:attr/textAppearanceListItemSmall"
    android:gravity="center_vertical"
    android:paddingStart="?android:attr/listPreferredItemPaddingStart"
    android:paddingEnd="?android:attr/listPreferredItemPaddingEnd"
    android:minHeight="?android:attr/listPreferredItemHeightSmall" />
```

Component Tree
- TwoLineListItem
  - Ab text1
  - Ab text2

simple_list_item2.xml

item 1	✓
item 2	✓
item 3	✓
item 4	✓

simple_list_item_checked

item 1	☐
item 2	☐
item 3	☐
item 4	☐

simple_list_item_multiple_choice

ArrayAdapter<T>: T = Student class

```
String[] data;
ArrayAdapter<Student> adapter;
ListView listView;
```

```
listView = findViewById(R.id.listview);

data = new String[] { object1, object2, object3, ... };

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


listView.setAdapter(adapter);
```

ListView: OnItemClickListener

```java
listView.setOnItemClickListener(new OnItemClickListener() {
    @Override
    public void onItemClick(
        AdapterView<?> parent,
        View view,
        int position,
        long id) {



    }
});
```

Example 1

Laptop	Smartphone	Car
Dell	iPhone	Honda
Apple	Samsung	Toyota
HP	Nokia	KIA
Acer	Oppo	Lexus
Toshiba	LG	Chevrol
Samsung	BPhone	Audi

Bai tap layout ⋮

ListView 1

Laptop

Smartphone

Car

ListView 2

Honda

Toyota

KIA

Lexus

Audi
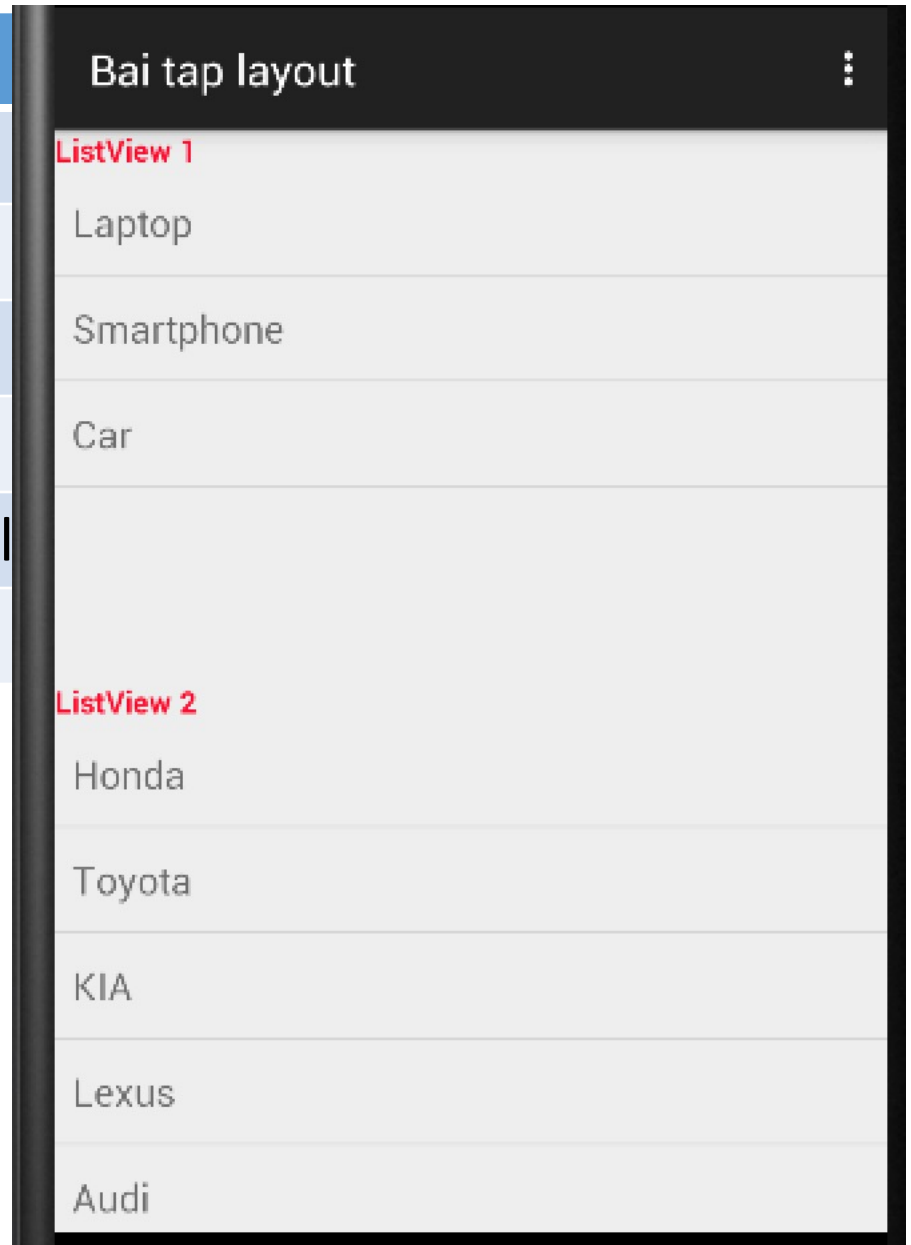
ListView Widgets

- ListView - ListActivity
- ListView - Activity
- ListView – onItemClickListener Event
- **ListView - Customize**

ArrayAdapter Customize
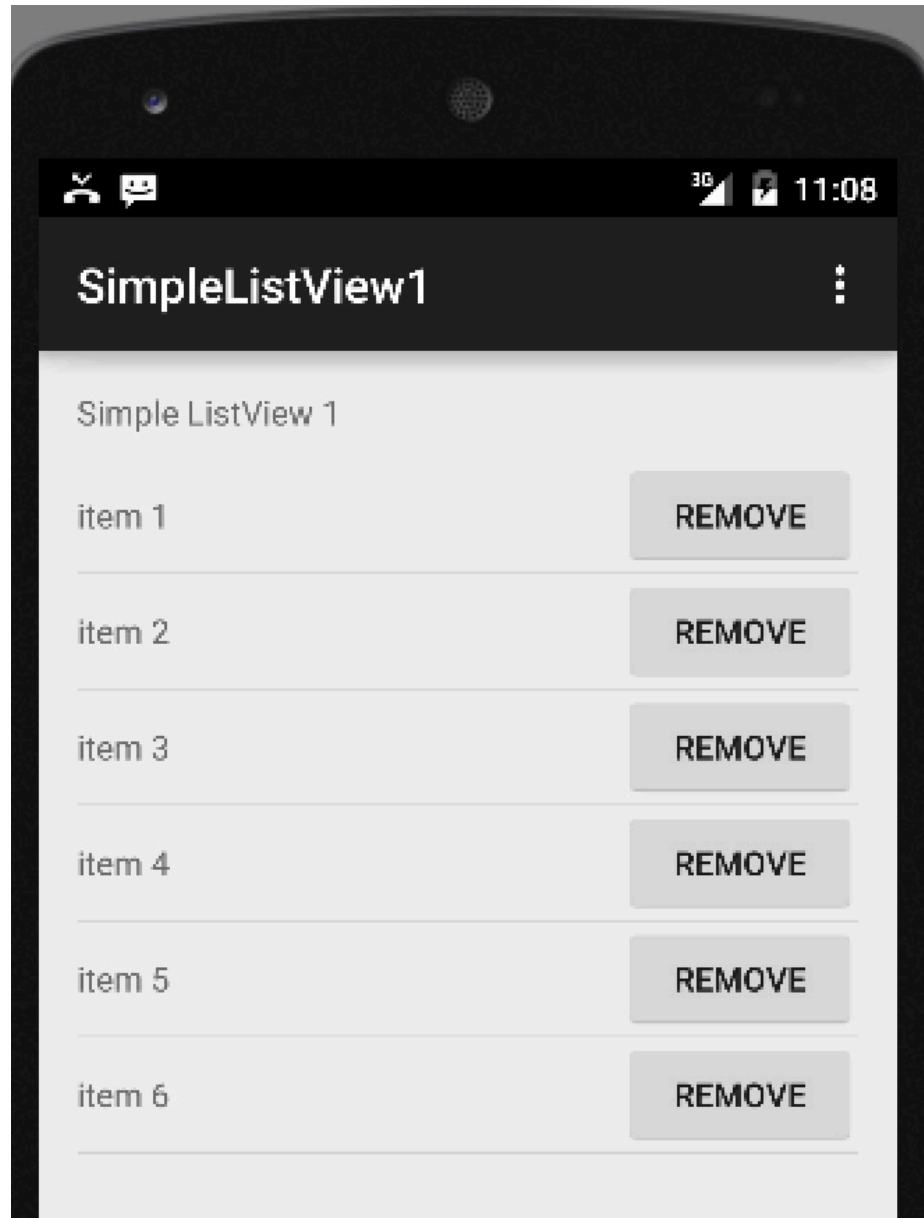
Customize ListView (ArrayAdapter)

```xml
<LinearLayout>
    <TextView
        android:layout_wi
        android:layout_we
        android:layout_he
        android:id="@+id/my_textView"
        android:text="Text Placeholder" />
    <Button
        android:layout_width="100dp"
        android:layout_height="wrap_content"
        android:text="Remove"
        android:id="@+id/btn_remove" />
</LinearLayout>
```
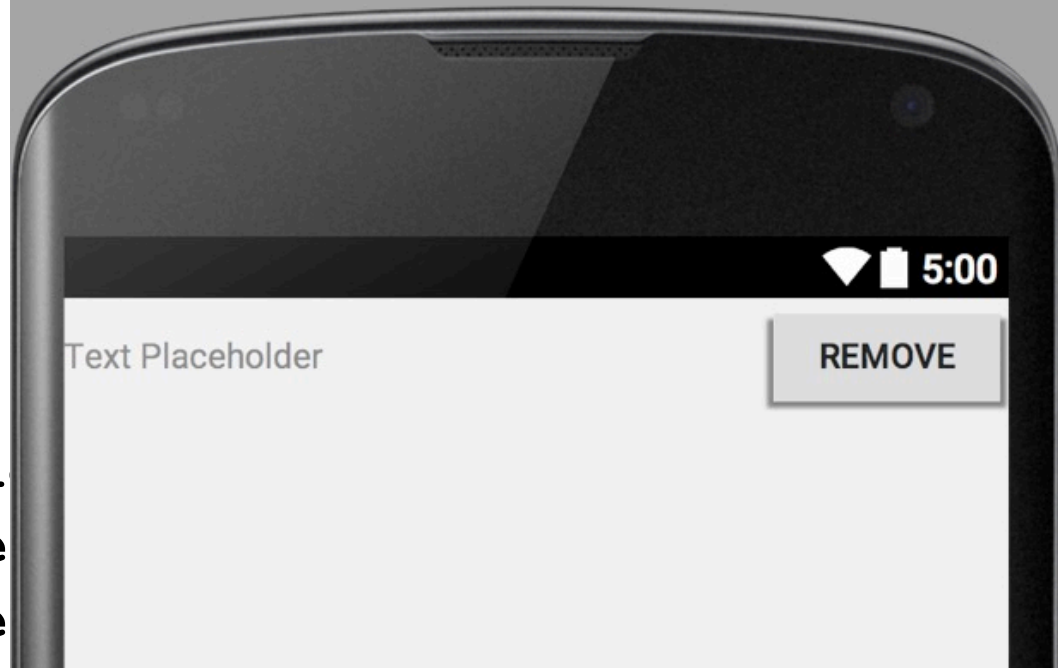
"my_list_item.xml" in layout directory

Customize ListView (ArrayAdapter)

```java
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_1);

    listView = (ListView) findViewById(R.id.myListView1);
    dataProvider = new ArrayList<>(Arrays.asList(
                "item 1", "item 2", "item 3",
                "item 4", "item 5", "item 6"));
    dataAdapter = new ArrayAdapter<String>(
            this,
            R.layout.my_list_item,
            R.id.my_textView
            dataProvider);
    listView.setAdapter(dataAdapter);
}
```
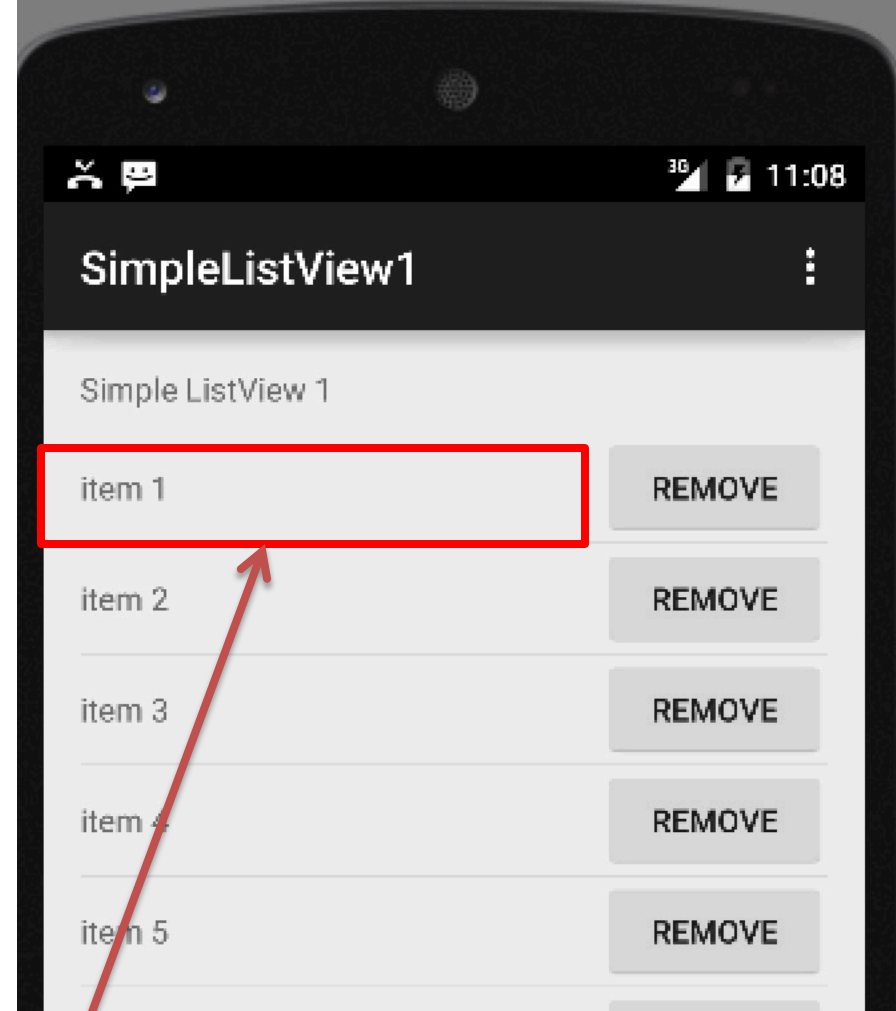
```
dataAdapter = new ArrayAdapter<String>(
                this,
                R.layout.my_list_item,
                R.id.my_textView
                dataProvider);
```

Comparison

```
dataAdapter = new ArrayAdapter<String>(
 this,
 android.R.layout.simple_list_item_1,
 dataProvider
);
```

```
dataAdapter = new ArrayAdapter<String>(
 this,
 android.R.layout.simple_list_item_checked,
 dataProvider
);
```

```
dataAdapter = new ArrayAdapter<String>(
                this,
                R.layout.my_list_item,
                R.id.my_textView
                dataProvider);
```

Example 2