

# Android UI Adapters

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# Topics

- AdapterView & Adapter
- AdapterView responsibilities
- ListActivity, ListView, and ListAdapter
- Spinner
- Gallery

# **AdapterView & Adapter**

# What is AdapterView Class?

- The *AdapterView* is a child class of *ViewGroup*
  - > A special kind of container of view objects (list items)
- Typically you are going to use subclasses of *AdapterView* class instead of using it directly
- Example subclasses of *AdapterView* class
  - > *ListView*
  - > *Spinner*
  - > *Gallery*
- An *AdapterView* access the data through *Adapter* object
  - > Instead of accessing data directly itself

# What is an Adapter?

- An *Adapter* object acts as a bridge between an *AdapterView* object and the underlying data for that view.
  - > The Adapter provides access to the data items.
- The Adapter is also responsible for making a View for each item in the data set.
- Types of Adapters - they implement *ListAdapter* interface
  - > *ArrayAdapter*
  - > *CursorAdapter*
  - > *There are a few more*

# Adapter Class Hierarchy

- *BaseAdapter* abstract class implements *ListAdapter* and *SpinnerAdapter* interfaces
- *ArrayAdapter* and *CursorAdapter* classes are subclasses of *BaseAdapter* class
- You can create a custom adaptor by extending *BaseAdapter* class



# **AdapterView Responsibilities**



# AdapterView Responsibilities

- Two main responsibilities of AdapterView
  - > Filling the layout with data (it received through the help of an Adapter)
  - > Handling user selections - when a user selects an item, perform some action

# Filling the Layout with Data

- Inserting data into the layout is typically done by binding the AdapterView class to an Adapter, which retrieves data from an external source (perhaps a list that the code supplies or query results from the device's database).

# Handling User Selections

- You handle the user's selection by setting the class's *AdapterView.OnItemClickListener* member to a listener and catching the selection changes

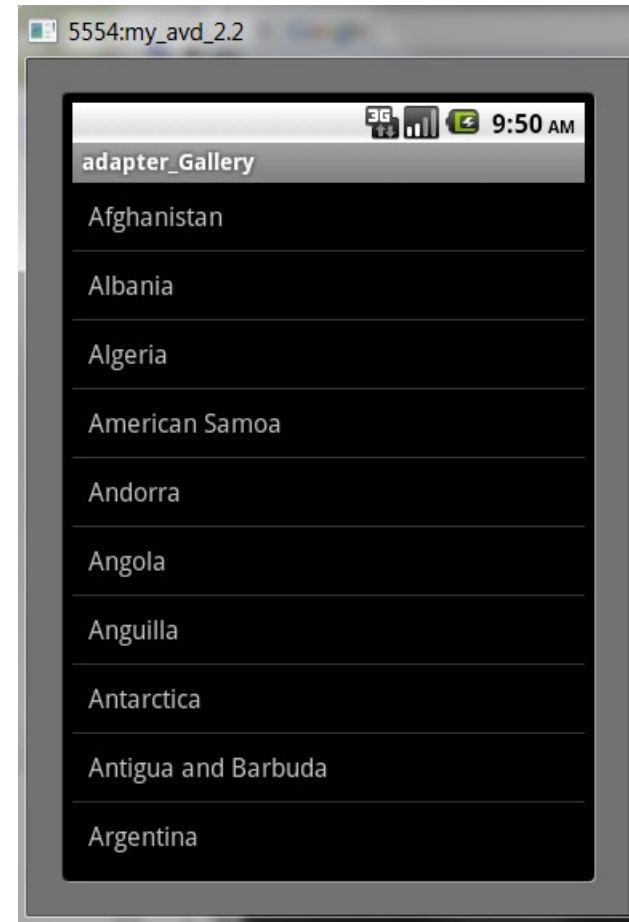
```
// Create a message handling object as an anonymous class.  
private OnItemClickListener mMessageClickedHandler = new  
OnItemClickListener() {  
    public void onItemClick(AdapterView parent, View v, int position, long id) {  
        // Display a messagebox.  
        Toast.makeText(mContext, "You've got an event",  
                        Toast.LENGTH_SHORT).show();  
    }  
};
```

```
// Now hook into our object and set its onItemClickListener member  
// to our class handler object.  
mHistoryView = (ListView)findViewById(R.id.my_list_view);  
mHistoryView.setOnItemClickListener(mMessageClickedHandler);
```

# ListView

# ListView Class

- A child class of AdapterView class
- Shows items in a vertically scrolling list.
- The items come from the ListAdapter associated with this view



# Two Choices of Activity Class

- Option #1 - Your activity extends Activity class
  - > You have to create ListView object yourself from resource file just like any other View object
- Option #2 - Your activity extends ListActivity class
  - > ListView object gets created by the ListActivity's constructor, so you don't need to create it yourself



# Option #1 - Extending Activity Class

```
public class HelloListView extends Activity {  
  
    @Override  
    public void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.main);  
  
        // Since HelloListView extends Activity (instead of ListActivity),  
        // we have to create ListView object ourselves.  
        ListView lv =(ListView)findViewById(R.id.listview);  
  
        ArrayAdapter<String> arrayAdapter = new ArrayAdapter<String>(  
            this, // Application context  
            R.layout.list_item, // layout description for each list item  
            COUNTRIES);  
  
        lv.setAdapter(arrayAdapter);  
  
    }
```

# Example of ListView Layout

```
<?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">
    <ListView
        android:id="@+id/listview"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"/>
</LinearLayout>
```

# Example of List Item Layout

```
<?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="fill_parent"
```

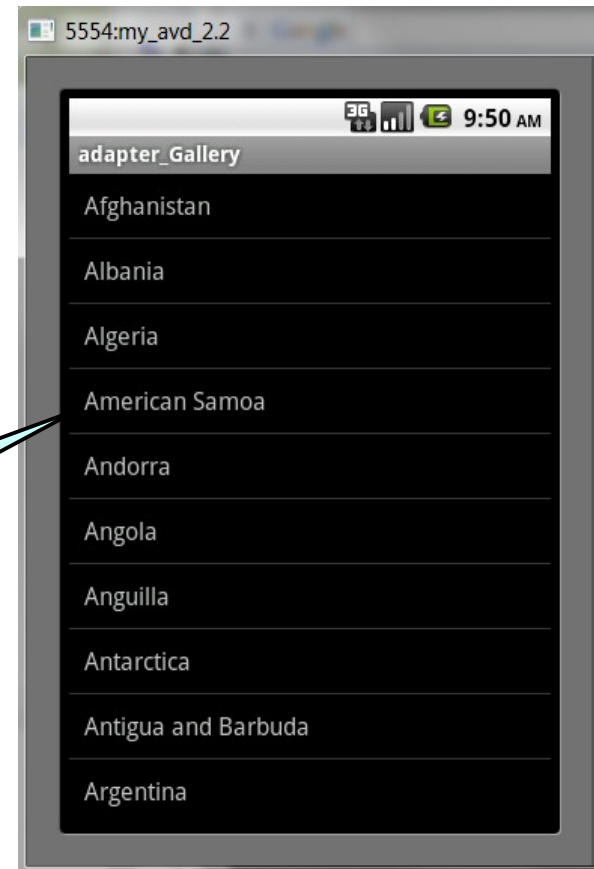
```
    android:padding="10dp"
```

```
    android:textSize="16sp"
```

```
>
```

```
</TextView>
```

List Item Layout



## Option #2: *ListActivity* Activity class

- Android-provided utility class specially designed for displaying a list of items by binding to a data source such as an array or Cursor, and exposes event handlers when the user selects an item.
  - > *ListActivity* hosts a *ListView* object that can be bound through an *adapter* to different data sources, typically either an array or a Cursor holding query results.
  - > *setListAdapter(ListAdapter adapter)* method automatically creates *ListView* object from the *ListAdapter* object
- Has a default layout that consists of a single, full-screen list in the center of the screen

# Option #2: Extending ListActivity

```
public class HelloListView extends ListActivity {  
  
    // Array as a data source  
    static final String[] COUNTRIES = new String[] {  
        "Yemen", "Yugoslavia", "Zambia", "Zimbabwe"  
    };  
  
    @Override  
    public void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
  
        // Create an adapter from Array data source object  
        ArrayAdapter<String> arrayAdapter = new ArrayAdapter<String>(  
            this, // Application context  
            R.layout.list_item, // layout description for each list item  
            COUNTRIES); // String array of countries defined  
  
        // Notice that this does not load a layout file for the Activity (which you  
        // usually do with setContentView(int)). Instead, setListAdapter(ListAdapter)  
        // automatically adds a ListView to fill the entire screen of the ListActivity.  
        setListAdapter(arrayAdapter);  
    }  
}
```

# Spinner



# Spinner Class

- A child class of *AdapterView* class
- Displays one child at a time and lets the user pick among them.
- The items in the Spinner come from the Adapter associated with this view
- There is NO special *SpinnerActivity* class, so you have to create Spinner object yourself

# Example of Spinner

```
public class HelloSpinner extends Activity {  
    /** Called when the activity is first created. */  
    @Override  
    public void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.main);  
  
        Spinner spinner = (Spinner) findViewById(R.id.spinner);  
        ArrayAdapter<CharSequence> adapter =  
            ArrayAdapter.createFromResource(  
                this,  
                R.array.planets_array,  
                android.R.layout.simple_spinner_item);  
  
        adapter.setDropDownViewResource(  
            android.R.layout.simple_spinner_dropdown_item);  
        spinner.setAdapter(adapter);  
        spinner.setOnItemSelectedListener(new MyOnItemSelectedListener());  
    }  
}
```

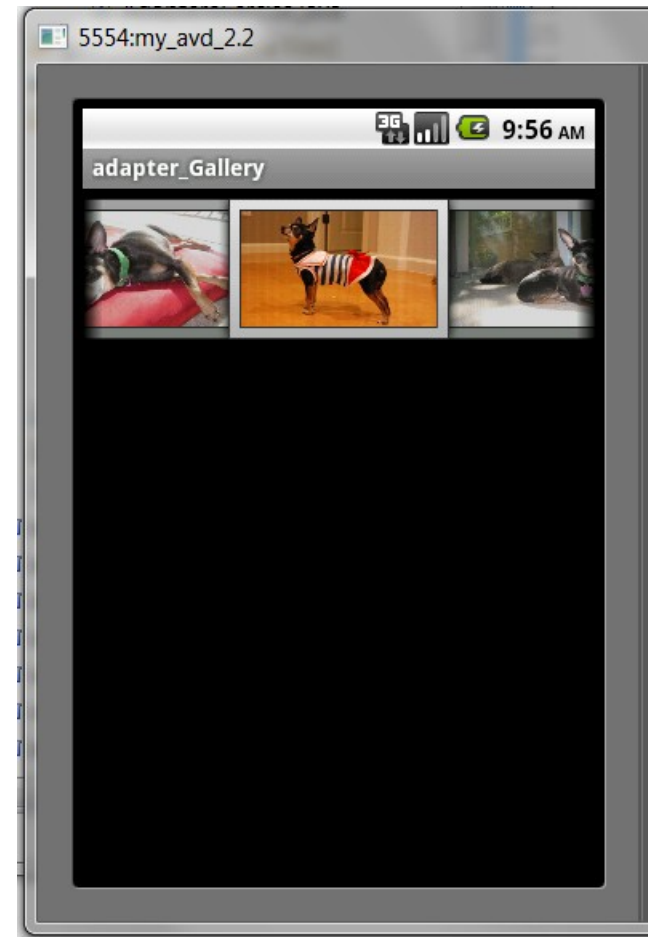
# Example of Spinner Layout

```
<?xml version="1.0" encoding="UTF-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:padding="10dip"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content">
    <TextView
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dip"
        android:layout_marginBottom="10dip"
        android:text="@string/planet_prompt"
    />
    <Spinner
        android:id="@+id/spinner"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:prompt="@string/planet_prompt"
    />
</LinearLayout>
```

# Gallery

# Gallery Class

- A child class of AdapterView class
- A view that shows items in a center-locked, horizontally scrolling list.



# Example of Gallery

```
public class HelloGallery extends Activity {  
    @Override  
    public void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
  
        setContentView(R.layout.main);  
        Gallery g = (Gallery) findViewById(R.id.gallery);  
  
        g.setAdapter(new ImageAdapter(this));  
  
        g.setOnItemClickListener(new OnItemClickListener() {  
            public void onItemClick(AdapterView parent,  
                                    View v, int position, long id) {  
                Toast.makeText(HelloGallery.this, "" +  
                    position, Toast.LENGTH_SHORT).show();  
            }  
        });  
    }  
}
```



# Example of Gallery Layout

```
<?xml version="1.0" encoding="utf-8"?>
<Gallery xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/gallery"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
/>
```

**Thank you!**

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