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Basic Todo App Tutorial

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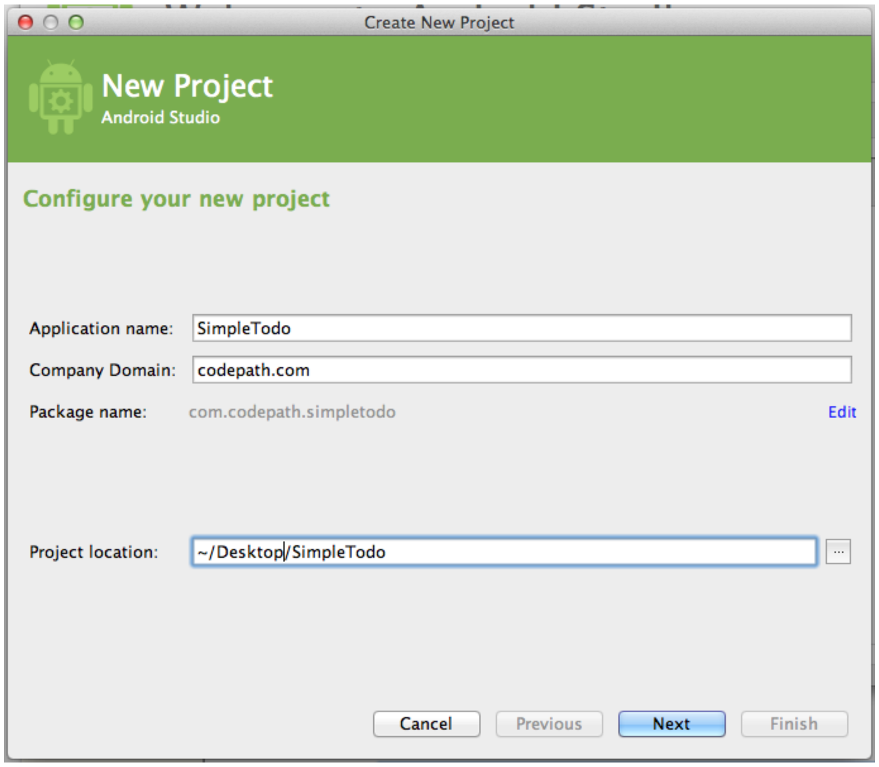
Peter So edited this page on Jan 24, 2016 · 15 revisions

This tutorial is a complementary reference which can be used in conjunction with this Todo app presentation to reference the source code step-by-step.

Note: This tutorial is designed for Android Studio and not for Eclipse. For building this in Eclipse, see this slide presentation.

Creating the Project

First, we create a new Android project with **minimum SDK 14** named `SimpleTodo` and then select "Empty Activity". Hit Finish to generate the project.



Application name: SimpleTodo
Company Domain: codepath.com
Package name: com.codepath.simpletodo
Project location: ~/Desktop/SimpleTodo

Configuring Android Studio

Go into Preferences for Android Studio. On a Mac through `Android Studio => Preferences` or on Windows with `File -> Settings`. Then find `Editor -> General -> Auto Import` and for Java we need to:

- Change `Insert imports on paste` to `All`
- Check `Add unambiguious imports on the fly` option

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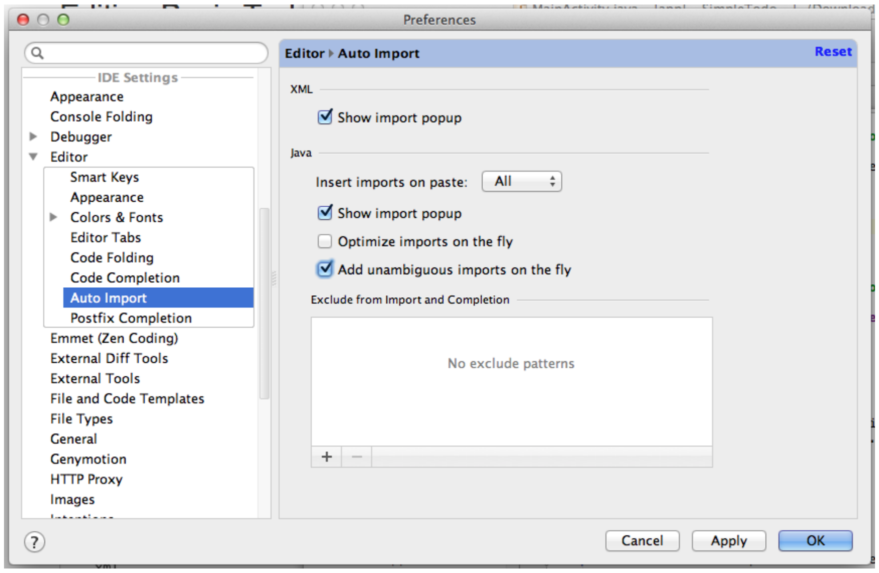
https://github.com/codepath

Clone in Desktop



Editor ▸ Auto Import

XML

- [✓] Show import popup

Java

Insert imports on paste: All

- [✓] Show import popup
- [ ] Optimize imports on the fly
- [✓] Add unambiguous imports on the fly

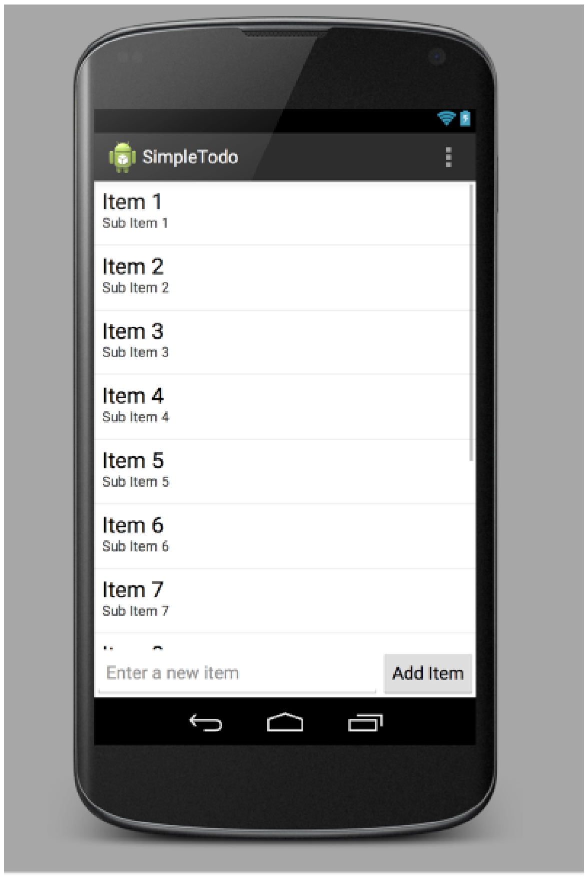
Exclude from Import and Completion

Creating our Layout

Next, we need to define the layout of our views. In particular, we want to add `Button` , a `EditText` and a `ListView` to our Activity in `app/src/main/res/layout/activity_main.xml` :

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <ListView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/lvItems"
        android:layout_alignParentTop="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_above="@+id/btnAddItem" />

    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/etNewItem"
        android:layout_alignTop="@+id/btnAddItem"
        android:hint="Enter a new item"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_toLeftOf="@+id/btnAddItem"
        android:layout_toStartOf="@+id/btnAddItem"
        android:layout_alignParentBottom="true" />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Add Item"
        android:id="@+id/btnAddItem"
        android:layout_alignParentBottom="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentEnd="true" />

</RelativeLayout>
```

which results in this layout for our Todo app:



Modifying our Activity

Now we need to open up our generated Activity java source file in `app/src/main/java/.../MainActivity.java` which looks like this **by default**:

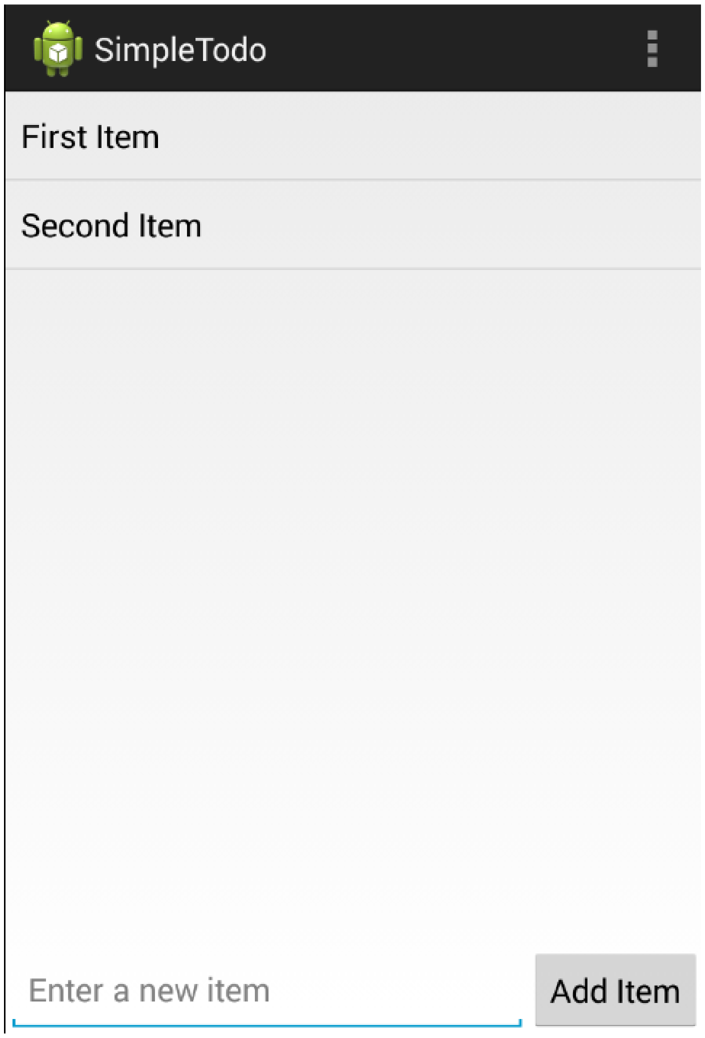
```
public class MainActivity extends Activity {

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


    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action bar if it is present.
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }
}
```

Creating List of Items

We need to create a list of todo items to display and an adapter to display them in our `ListView` within the `Activity` java file:

```
public class MainActivity extends Activity {
    private ArrayList<String> items;
    private ArrayAdapter<String> itemsAdapter;
    private ListView lvItems;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        // ADD HERE
        lvItems = (ListView) findViewById(R.id.lvItems);
        items = new ArrayList<String>();
        itemsAdapter = new ArrayAdapter<String>(this,
                        android.R.layout.simple_list_item_1, items);
        lvItems.setAdapter(itemsAdapter);
        items.add("First Item");
        items.add("Second Item");
    }
}
```

which when we run the app with `Run => 'app'` results in:



Adding Items

First, let's add an `android:onClick` handler to our layout XML file in `app/src/main/res/layout/activity_main.xml`:

```
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Add Item"
    android:id="@+id/btnAddItem"
    android:layout_alignParentBottom="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentEnd="true"
    android:onClick="onAddItem"
/>
```

and then add the following method handler to the Activity java file:

```
public class MainActivity extends Activity {

    // ...onCreate method

    public void onAddItem(View v) {
        EditText etNewItem = (EditText) findViewById(R.id.etNewItem);
        String itemText = etNewItem.getText().toString();
        itemsAdapter.add(itemText);
        etNewItem.setText("");
    }

    // ...
}
```

And now we are able to add items to the list.

Removing Items

Let's hook up an event handler so that when an item is long clicked (pressed and held), the item will be removed:

```
public class MainActivity extends Activity {

    // ... variable declarations

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        // ... existing code ...
        items.add("Second Item");
        // Setup remove listener method call
        setupListViewListener();
    }

    // Attaches a long click listener to the listview
    private void setupListViewListener() {
        lvItems.setOnItemLongClickListener(
                new AdapterView.OnItemLongClickListener() {
            @Override
            public boolean onItemLongClick(AdapterView<?> adapter,
                                           View item, int pos, long id) {
                // Remove the item within array at position
                items.remove(pos);
                // Refresh the adapter
                itemsAdapter.notifyDataSetChanged();
                // Return true consumes the long click event (marks it handled)
                return true;
            }

        });
    }

    // ...onAddItem method

}
```

and now we are able to remove items from the list.

Persist Items to File

First, we need to add the `commons.io` library into our gradle file dependencies to make reading and writing easier by modifying `app/build.gradle` :

```
dependencies {
    compile 'org.apache.commons:commons-io:1.3.2'
}
```

Select `Tools => Android => Sync Project with Gradle Files` to reload the dependencies.

With the library loaded, we need to define the methods to read and write the data to a file:

```
public class MainActivity extends Activity {

    private void readItems() {
        File filesDir = getFilesDir();
        File todoFile = new File(filesDir, "todo.txt");
        try {
            items = new ArrayList<String>(FileUtils.readLines(todoFile));
        } catch (IOException e) {
            items = new ArrayList<String>();
        }
    }

    private void writeItems() {
        File filesDir = getFilesDir();
        File todoFile = new File(filesDir, "todo.txt");
        try {
            FileUtils.writeLines(todoFile, items);
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}
```

and then call those methods when the app is launched (read from disk) and then write to disk when items change (items added or removed) within the `Activity` :

```
public class MainActivity extends Activity {

   @Override
    protected void onCreate(Bundle savedInstanceState) {
        // ... super, setContentView, define lvItems
        readItems(); // <---- Add this line
        itemsAdapter = new ArrayAdapter<String>(this,
                android.R.layout.simple_list_item_1, items);
        // ... rest of existing code
    }

    private void setupListViewListener() {
        lvItems.setOnItemLongClickListener(
                new AdapterView.OnItemLongClickListener() {
            @Override
            public boolean onItemLongClick(AdapterView<?> adapter,
                                           View item, int pos, long id) {
                items.remove(pos);
                itemsAdapter.notifyDataSetChanged();
                writeItems(); // <---- Add this line
                return true;
            }

        });
    }

    public void onAddItem(View v) {
        EditText etNewItem = (EditText) findViewById(R.id.etNewItem);
        String itemText = etNewItem.getText().toString();
        itemsAdapter.add(itemText);
        etNewItem.setText("");
        writeItems(); // <---- Add this line
        }

    }
```