




Java programming (including Android), under Eclipse or Android Studio



Copyright © 2007-2021 by [Eric D. Piehl](http://ericpiehl.com). This work is made available under terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License <http://creativecommons.org/licenses/by-nc-sa/3.0/>."

Based on (1) [GRCC](http://www.grcc.edu) CO117 Java 2007-09-12; and [Grand Rapids Java User's Group GRJUG](http://www.gr-jug.org) events (2) "Intro to Eclipse" by Carlus Henry, SageTech LLC 2007-02-20, and (3) "Android Xperience" 2013-06-18/10-15 www.meetup.com/gr-jug/events. For date this file last updated, please see page footer. For information on  green or `</>` other programming subjects, please see a list of [this document's sister docs](#).

Contents

Java programming (including ) , under  Eclipse or Android Studio	1
1 Architecture	2
2 Ideas	2
3 Install Eclipse (or other IDE listed in Tools)	3
3.1 Android	3
3.2 Other	4
4 Run Eclipse	5
4.1 Android	5
4.2 All	5
5 Create a new Java Project	6
6 To find Classes	6
7 To import code or library (e.g., .jar file) into workspace /lib folder	6
7.1 Non-Android?	6
7.2 Android	6
8 To create a Class	7
9 To hack your source file	8
9.1 External Strings	8
9.2 To add an Activity (Android screen)	8
9.3 To add an Action Bar menu Options button to an Activity (Android screen)	9
9.4 To externalize control off to a Service, to survive Activity destroy/create	10
9.5 To separate Service off to frontend/backend Model–View–Controller MVC	11
9.6 All	11
10 To compile or run your app	12
10.1 Non-Android	12
10.2 Android	12
10.3 Build	12
11 To debug your app	13
12 To beautify—make it look pretty	13
13 To create Javadoc	13
14 To publish: create a .jar file	14
15 To submit to Instructor	14
16 TODO	15

Android Studio

Launch

If you get "Error launching Android Studio" "No JVM installation found. Please install a 64-bit JDK. If you already have a JDK installed, define a JAVA_HOME variable in Computer > System Properties > System Settings > Environmental Variables.", then do so from <https://duckduckgo.com/?q=jdk> or <https://google.com/search?q=jdk>.

C:\Program Files\Java\jdk1.7.0_51\

JDK info <http://docs.oracle.com/javase/>

<https://plus.google.com/s/gr-jug>

New Project...

2014-07-15 uninstalling Android Studio 0.4.2, so I can install new 0.8.2.
It got rid of everything under C:\Apps\Android\android-studio.
Deleted Eclipse from C:\Apps\EclipseAndroidDeveloperToolsADT. Now up to 100 Gb free.

Need to install Android Studio 0.8.2. from <http://developer.android.com/sdk/installing/studio.html#download> and <http://developer.android.com/sdk/installing/index.html?pkg=studio> and <http://developer.android.com/sdk/installing/adding-packages.html>.

Done.
Put in C:\Users\EricPiehl\AppData\Local\Android\android-studio\sdk instead of C:\Apps\Android\android-studio\sdk.

Do Help > Check for Updates.
Do button SKD Manager.

1 Architecture

OSGi Open Services Gateway interface
Bundle providers
Innoopract
IBM
BEA
Actuate
...

2 Ideas

Eclipse—the greatest **Java IDE** of all time.
"Java in a Nutshell", by O'Reilly is paper Javadoc.
[A Brief History of Java and JDBC.](#)

Reference = pointer.
Methods = member functions, or routines.

Workspace
Projects
classes
files
objects
UML objects ----- arrow points to parent -----
Name	----->	Name
-----		-----
Data		Data
-----		-----
Behavior		Behavior
-----		-----

"Has-A" = Composition Relationship.
Needs more data to go from one class to the other.
Hierarchical, but not in Generalization-Specialization Relationship.
Car ---- SteeringWheel.
Side-by-side, no arrow, in UML.
If your class "has-a"nother class, implement by instantiating an object of that other class.

"May-be-associated-with" = Aggregation Relationship. Fuzzier than Composition Relationship.
Ponds ----- Ducks.

"Is-like-a" = Substitution Relationship.
DVD "is-like-a" VideoTape.

Could both extend a Player class.

"Is-A" = Generalization-Specialization Relationship = Inheritance Relationship = Substitution.
Polymorphism. Overriding. Subtyping.
Hierarchical.

Circle ----> Shape.

Parent over the other, with arrow to the parent, in UML.

Helps reuse code with little or no mods.

If your class "is-a" nother class, implement by child class "extends" the parent class.

upcast	Primitive Types	downcast
A	-----	lossy
not		
lossy*	double	allowed
	float	only by
allowed	int	casting
by Java	bool	V

* = more room to store all information in lower types, and more.

upcast	Complex Types, ancestor class	downcast
A	-----	allows use of override**
not	door shape	
lossy*	A A	allowed
		only by
allowed		casting
by Java	slider securityDoor circle rectangle	V
Is-A	derived class	Inherit

* = keeps the attributes and methods of the child type even if stored in a parent type object.

** allows use of override methods and non-applicable attributes?

3 Install Eclipse (or other IDE listed in [Tools](#))

<http://cs.calvin.edu/curriculum/cs/112/resources/installingEclipse/videos/> nice **video instructions**, thanks to Calvin College Prof. **Joel Adams**.

Better for professionals—put only what you need in each Workspace

<http://download.eclipse.org/eclipse/downloads/> > Latest Release > Platform Runtime Binary > *yourOS*, etc.

-OR-

Easy—all-at-once www.eclipse.org > Download > tab Packages > Eclipse IDE for Java [EE] Developers > *yourOS*, etc. [Was Europa 3.2 when I wrote this. Later Helios 3.6.1. Now 4.2.1.]

-OR-

3.1 Android

If you want to do Android development, download the **Android SDK with Android Developer Tools ADT** Bundled for Windows <http://developer.android.com/sdk/> > "Download the Android SDK ADT Bundle for Windows".

-OR-

Install the new **Android Studio** from <http://developer.android.com/sdk/installing/studio.html>, but as of 2013-06-18, the Android Studio is said to be "Early Access Release", have bugs, and crash every 15 minutes.

Follow other Android prerequisites from <https://groups.google.com/forum/#!topic/grand-rapids-java-user-group/eIwrk4nXdnE>:

- Follow other installation steps from "C:\Users\EricPiehl\Documents\EricPiehlEdu\EclipseAndroidDeveloperToolsADT\Quick Installation Guide for ADT - Google Drive.pdf".
 - "Unpack the files into a directory and take note of the path to the SDK.
 - [Open Eclipse](#).
 - Install **Eclipse Plugin**:
 - **Help > Install New Software.**

- Click button **Add** in the upper right corner.
- Enter Name=**ADT**, and Location=<https://dl-ssl.google.com/android/eclipse/>, and click OK.
- Next check the checkbox next to **Developer Tools** and click **Next > Next >** accept terms **> Finish**.
- **Restart** Eclipse. When Eclipse opens you will be asked to point to the SDK.
- Select Use Existing SDKs, and navigate to the path where the SDK was unpacked (above).
- **Configure Virtual Device**
In order to run your Android Applications locally; you are going to need an emulator for an Android Device. Here are the steps necessary to configure the emulator that we will be using.
 - Eclipse > Window > **Android Virtual Device Manager**.
 - Click **New** to add a new Virtual Device.
 - If you don't have something better, set AVD Name=Nexus_One, Device=Nexus One (3.7", 480 x 800 hdpi), Target: Android 4.2.2 – API Level 17, Hardware keyboard present, Display a skin with hardware controls, RAM=512, VM Heap=32, Internal Storage=200 MiB, and select OK.
- **Check Environment**
Let's verify that we have everything working by running one of the example Android applications from Google. Once this has been verified, you are all set to go.
Install Samples:
 - Eclipse > Window > **Android SDK Manager**.
 - Select for your "Android v.v.v" of interest, "**SDK Platform**" and "**Samples for SDK**".
 - Select "Extras" "**Google USB Driver**" and anything else you need.
 - Click button **Install packages > Accept License > Install**.
 - When installation is complete, you can view the samples under path `<sdk>/samples/android<version>/` (for me, `"C:\Apps\EclipseAndroidDeveloperToolsADT\sdk\samples\android<version>"`).
- **Run ContactManager Sample**
There are many sample projects that come with Samples for SDK. I chose ContactManager. The steps below will walk you through importing a project, start the Virtual Device, and run an Android Application.
 - From Eclipse right click in **Package Explorer > Import....**
 - **Android > Existing Android Code into workspace > Next**.
 - The samples folder is installed under sdk. Open the samples folder `"C:\Apps\EclipseAndroidDeveloperToolsADT\sdk\samples\android<version>"` > ContactManger > OK > select > Finish.
 - [Compile and run as below.](#)

3.2 Other

<http://download.eclipse.org/webtools/downloads/>

<http://code.google.com/webtoolkit/> GWT Google web toolkit

www.csszengarden.com

web page debugging Firebug (see [Tools](#))

source control Subversion or Git (see [Tools](#))

www.springsource.com GUI

[Javatester](#), including a nice [tester of which Java version your browser is using](#).

[Another Java tester](#). [Old Java version uninstall tool](#).

4 Run Eclipse

Launch **Eclipse.exe**:

- **Android Studio** is at "<file:///C:/Apps/Android/android-studio/bin/studio64.exe>".
-OR-
- A long time ago, I put Eclipse somewhere else. For me after reinstall mid-2013, Eclipse is at "<file:///C:/Apps/EclipseAndroidDeveloperToolsADT/eclipse/eclipse.exe>".
 - **TODO:** *Actually, that doesn't work, but "<file:///C:/Apps/EclipseAndroidDeveloperToolsADT/SDK Manager.exe>" does.*

If portable, put **Workspace** on a flash-drive/jumpdrive/thumbdrive/USB-drive/USB-key/USB-stick
<F:\eclipse\workspace>.

Else maybe [%USERPROFILE%\Documents\GRLUG\eclipse\workspace](#). (For me after reinstall mid-2013, is at "<file:///C:/Users/EricPiehl/Documents/EricPiehlEdu/EclipseAndroidDeveloperToolsADT/>".)

Periodically (monthly?) **update** at:

- Help > **Check for Updates**.
- Eclipse > Window > Android **SDK Manager** > check items with Status="Update available:..." > "Install n packages...".

4.1 Android

Start your Virtual Device via Eclipse > **Window** > **Android Virtual Device Manager**.

Highlight the [Android Virtual Device you created earlier](#), click button  **Start...** on the right > **Launch**.

Do it now—you will need it [later](#), and it takes forever to initialize itself.

If problems, look at Eclipse pane **Console**, or "**LogCat**" for application errors.

4.2 All

Save a test Perspective.

If delete a frame, bring back with Window > Show View. Can bring back to default, with Window > Reset Perspective.

Something like:

Package Explorer	Text Editor	Outline	Help
Hierarchy		Ant	

Problems

Javadoc

Declaration

Console

Put Javadoc in SE pane.

To change Eclipse Options so that Ctrl-Shift-F (right-click Source > Format) will put my "{" on a new line, set Window > Preferences > Java > Code Style > Formatter > New Profile > Edit... > Braces tab > set every dropdown box to Next line > correct settings on tab White Space, Blank Lines, New Lines, Control Statements, Line Wrapping and Comments > OK > OK.

5 Create a new Java Project

Either here, or Import whole tree as in [two sections down](#).

In pane **Package Explorer**, [right-click|File >] New > Project...

In the **New Project...** dialog, select:

- **Java Project** (your choice on ordinary, or "from Existing Ant Buildfile"), or
- **Android Project** (your choice on "Application", "Sample" or "from Existing Code").

In the New <projectType> Project dialog, give it:

Project name: in **UpperCamel**, e.g., *YourProject* or *PiehlAssignmentZero*.

Create new project in workspace.

Contents: Use default JRE

Project Layout: Create separate folders for sources and class files.

Working set: no Add project to working set.

In Android, uncheck Create customer launcher, check Create Activity.

Finish.

Use **Package Explorer** to open and manage all project files.

When Create Activity, blank Activity, name=*YourProject*.

```
package com.ericpiehl.col117.assignmentzero
```

```
Packages com.polarseal.database.window v. com.polarseal.gui.window
```

6 To find Classes

www.gotapi.com for HTML, SQL, etc.

www.javapolis.com.

<http://jakarta.apache.org/commons> for http client, net, I/O, database, JDBC html CCS.

www.google.com/codesearch

www.archive.org

7 To import code or library (e.g., .jar file) into workspace /lib folder

7.1 Non-Android?

1. In the Package Explorer pane, click on *yourProject*, and select File > New > Folder > lib.
2. Preferably in Navigator pane, drop in the .jar file from wherever into the workspace/project/lib folder.

If you didn't do the above in the Navigator pane, F5 or Right-click project > Refresh.

3. Back in the Package Explorer pane, right-click on the .jar > Build Path > Add to Build Path.

Note in the Package Explorer pane, that the .jar moved from the lib folder to Referenced Library.

4. Right-click on the .jar > Properties > Javadoc Location > select "Javadoc in archive" > select "Workspace file" > Archive path Browse... to the .jar > OK > Path within Archive Browse... > select the documentation, which is usually the /doc folder > OK > Validate > OK > OK.

Javadocs will now appear when a class, object or method is selected or when you hover.

Window > ShowView > Javadoc: the Javadoc view also works with this and gives a bit more room to view the documentation and the source.

5. If the jar has source, right-click on the .jar > Properties > Java Source Attachment > Workspace... > select the jar > OK > OK.

6? Right-click on the .jar > "Add to Classpath"? <*DataAbstraction.ppt s/l13 Finding Classes*.

7.2 Android

To use Sample that came from Android:

- From Eclipse right click in **Package Explorer** > **Import...**
- **Android** > **Existing Android Code into workspace** > **Next.**

- The samples folder is installed under sdk. Open the samples folder
`"C:\Apps\EclipseAndroidDeveloperToolsADT\sdk\samples\android<version>" >`
`yourSample > OK > select > Finish.`

If you want code or samples from **GitHub**:

- **One-time:**
 - Install **GitHub Desktop** <https://desktop.github.com/>. [I did so on 2018-02-26 and 2016-10-02 (different machines). I installed the older **GitHub for Windows** <http://windows.github.com/> on 2016-04-21 and 2013-08-20 (different machines).]
 - Read Guide <https://guides.github.com/activities/hello-world/>.
- For each project's **GitHub repository**:
 - **GRJUG** at <https://github.com/grjug> such as week one "Favorite Colors",
 - **iNaturalist** at <https://github.com/inaturalist> repertories for Rails, Android, iOS, iPadOS, etc.,
 - **USTreeAtlas** clone <https://github.com/wpetry/USTreeAtlas>,
 - or in general, <https://github.com/> . . .
- **ForK** → **Clone or download** > **Open in Desktop** **Clone in Desktop** > wait > Save prj to your computer and use it in GitHub Desktop.
 - Hover over the repository to see where it is.
 - In Android Studio or Eclipse, **Import** **Project? that at its internal .gradle file.**
 - **Build it and run it.**
- If you want the Master branch (tip-of-the-tree):
 - Drag the repository blue-on-white name to your **Start** > **GitHub, Inc.** > **GitHub** > little icon "drag a repository here to add". [I did that, then copied to `"C:\Users\EricPiehl\Documents\EricPiehlEdu\EclipseAndroidDeveloperToolsADT\YourProject_GITHUB_GRJUG"`.]
- If you want another branch, click "releases", chose the release you want, then download the zip or tar.gz version, unzip it yourself, then Eclipse > File > **Import**.

I got project **DroidSheep** v36 via:

- **One-time:** Install SVN via [Tools](#),
- <http://droidsheep.de> > <https://code.google.com/p/droidsheep/source/checkout> `"svn checkout http://droidsheep.googlecode.com/svn/trunk/ droidsheep-read-only"` > copied to `"C:\Users\EricPiehl\Documents\EricPiehlEdu\EclipseAndroidDeveloperToolsADT\droidsheep-read-only_DROIDSHEEP_DE"`.

To get Android assets, such as icons, see <http://android-ui-utils.googlecode.com/hg/asset-studio/dist/icons-launcher.html#foreground.space.trim=1&foreground.space.pad=0&foreColor=33b5e5%2C0&crop=0&backgroundShape=bevel&backColor=ffffff%2C100>.

8 To create a Class

In the Package Explorer panel, src folder, [right-click|File >] New > Class.

Package #package "com.ericpiehl.project" or "edu.grcc.co117.examples"

Name=**YourProject**.

Select Public as the modifier.

The superclass should be `java.lang.Object` by default (usually, exceptions below).

Select `public static void main(String args[])` as a method stub to create.

If you want to create a constructor stub in the code, select "Constructors from superclass".

Select Generate comments.

Create new **Application Class** via File > New > Java Class > Name=**YourProjectApplication** and Superclass=**android.app.Application** > Finish.

Leave all other fields blank.

Click all checkboxes > Finish.

```
#import
public class YourProject {
    public static void Main() {
    }}
```

Use Package Explorer > package > Properties > Java Build Path > Source tab, put "eclipse" in output folder somewhere to remove confusion.

Update `main()`, by...

9 To hack your source file

Example string array:

```
String[] myColors = new String[]{"Blue", "Red", "Yellow", "Orange"};
```

Not `String Array:String[]` ?

If you see wavy red lines under something:

- Hover > choose an **Import** option.
- If that doesn't work, see lots of stuff in [last subsection in this section](#).

9.1 External Strings

Externalize your strings in `yourProject\res\values\strings.xml`, by adding XML element `string` with attribute `name`, such as `<string name="myColors">Red Yellow Green Blue</string>`.

9.2 To add an Activity (Android screen)

An **Activity** is a combination of a **Class** and a **Layout**.

Roughly, a **screen showing right now** is a combination of an **instantiation of an Activity class**, and a **Layout**.

If you created an Activity while creating the project, set `tbd=blank`, `name=yourActivity`. Then:

- To `yourProject\src\packageValueFromRootAndroidManifestXmlWithSlashesInsteadOfDots\yourActivity.java`, verify that it includes:

```
protected void onCreate(Bundle savedInstanceState) {  
super.onCreate(savedInstanceState);  
setContentView(R.layout.yourActivity);  
    ListView lv = (ListView) findViewById(R.id.yourProjectListView);  
    String[] myColors = new String[]{"Blue", "Red", "Yellow", "Orange"};  
    ListAdapter fcAdapter = new ArrayAdapter<String>(this,  
        R.layout.yourActivity_list_item, myColors);  
lv.setAdapter(fcAdapter);  
}
```
- Clone `yourProject\src\packageValueFromAboveWithSlashesInsteadOfDots\yourExistingActivity.java`, to `yourNewActivity.java`.
- Edit its class name from `YourExistingActivity` to `YourNewActivity`.

[For week one 2013-06-18 Android Xperience ListView Challenge, this was called **FavoriteColor**. At first, I misspelled `FavoriateColor`, but later refactored.]

To add items to screen layout, add one or more Controls to the screen in `yourProject\res\layout\activity_yourProject.xml`:, inside tag `RelativeLayout`, add one or more of:

- ```
<ListView android:id="@+id/yourProjectListView"
 android:layout_width="match_parent"
 android:layout_height="wrap_content"
 android:layout_alignParentLeft="true"
 android:layout_alignParentTop="true" />
```
- ```
<TextView android:id="@+id/textView1"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="@string/hello_world" />
```
- ```
<TextView android:id="@+id/textView2"
 android:layout_width="wrap_content"
 android:layout_height="wrap_content"
 android:layout_alignLeft="@+id/textView1"
 android:layout_below="@+id/textView1"
```



- ```

        android:layout_marginTop="34dp"
        android:text="@string/myColors" />
    
```
- ```

 <EditText android:id="@+id/editText1"
 android:layout_width="wrap_content"
 android:layout_height="wrap_content"
 android:layout_alignParentLeft="true"
 android:layout_below="@+id/textView2"
 android:layout_marginTop="36dp"
 android:ems="10" />

```

Add a list view via Create Android XML file.

~~Add Action Bar menu:~~

Folder src has .java code

Folder res\layout has .xml files

AndroidManifest.xml

ListView

ListAdapter

RelativeLayout (R.layout.activity\_YourProject)

TextView

To **create** a new **Activity** (Android screen):

- To `yourProject\AndroidManifest.xml`, within tag `application`, add tag:
 

```

 <activity android:name="packageValueFromAbove.yourNewActivity"
 android:label="@string/app_name"></activity>

```
- Clone `yourProject\src\packageValueFromAboveWithSlashesInsteadOfDots\yourExistingActivity.java`, to `yourNewActivity.java`.
- Edit its class name from `YourExistingActivity` to `YourNewActivity`.

### 9.3 To add an Action Bar menu Options button to an Activity (Android screen)

In an **Activity**, **hook up** an **Action Bar** menu **Options** button:

- To `yourProject\src\packageValueFromAboveWithSlashesInsteadOfDots\yourActivity.java`, within class `YourActivity`, add:

```

@Override
public boolean onOptionsItemSelected(MenuItem item) {
 switch (item.getItemId()) {
 case R.id.menu_myMenu:
 Intent intent = new Intent();
 intent.setClass(this, YourOtherActivity.class);
 startActivity(intent);
 return true;
 default:
 return super.onOptionsItemSelected(item);
 }
}

```

To **show** that **Action Bar** menu **Options** button in an Activity (Android screen):

- To `yourProject\res\menu\yourActivityMenu.xml`:
  - Change tag `item` attribute `android:showAsAction` from value `"never"` to `"always"`.

If you want to **show** another **Options** button in an Activity (Android screen):

- To `yourProject\res\menu\yourActivityMenu.xml`:
  - Clone tag `item` to another one.
  - Change tag `item` attribute `android:orderInCategory` to 100 more than its source attribute.

If you want to make that **Options** button show a **particular icon** in an Activity (Android screen):

- To `yourProject\res\menu\yourActivityMenu.xml`:
  - Add tag `item` attribute `android:icon="@drawable/iconName"`, where `iconName` is a `.png` file that exists in folder `yourProject\res\drawable-size`.

You may have gotten these by dragging a folder tree of these icons from Windows File Explorer over into Eclipse > Package Explorer > folder `yourProject/res/`.

- o ???Change tag `item` attribute `android:id` from value `"@+id/action_settings"` to `"@+id/menu_myMenu"???`

**Shift-Ctrl-R** = open a **Resource** via patter, e.g., `".manifest"` or `"strings"`.

*TODO: Is this supposed to be useful? `yourProject/res/values/strings.xml` ?*

**Shift-Ctrl-C** = see the activity.

## 9.4 To externalize control off to a Service, to survive Activity destroy/create

Create new **Service Class** via File > New > Java Class > Name=`YourProjectService` (default Superclass) > Finish.

Populate it with (in green):

```
public class YourProjectService {
 private List<String> colors = new ArrayList<String>(); //this needs to survive
 public YourProjectService() { //need a constructor
 colors.add("Yellow");
 colors.add("Green");
 colors.add("Red");
 colors.add("Blue");} //initial list--more will be added at runtime by addColor()
 public List<String> getColors() {return colors;} //getter
 public void addColor(String newColor) {colors.add(newColor);} //add at runtime
}
```

Create new **Application Class** via File > New > Java Class > Name=`YourProjectApplication` and Superclass=`android.app.Application` > Finish.

Populate it with (in green):

```
public class YourProjectApplication extends Application {
 private YourProjectService service = new YourProjectService(); //need survive
 public String getStatusMsg() {return "in getStatusMsg()";}
 public YourProjectService getService() {return service;} }
```

Hook up the above: select project root `AndroidManifest.xml` (if it looks like a webform, click lower-tab to show in XML format), to element `application`, add attribute `android:name=".YourProjectApplication"`, as:

```
<application android:allowBackup="true"
 android:icon="@drawable/ic_launcher"
 android:label="@string/app_name"
 android:theme="@android:style/Theme.Holo.Light"
 android:name=".YourProjectApplication">
 <activity android:name="com.example.yourProject.YourActivity"
 android:label="@string/app_name">
```

In `YourActivity.java`, populate it with (in green):

```
public class YourActivity extends Activity {
 ArrayAdapter<String> fcAdapter; // moved here to survive Activity delete/recreate
 @Override
 protected void onCreate(Bundle savedInstanceState) {
 super.onCreate(savedInstanceState);
 // get Service, so this app's data can survive Activity delete/recreate
 Application application = getApplication(); // get app > my app >
 YourProjectApplication thisApp = (YourProjectApplication) application;
 String msg = thisApp.getStatusMsg(); // optional msg and
 Log.w("in YourActivity()", msg); // optional logging >
 YourProjectService service = thisApp.getService(); // Service.
 setContentView(R.layout.yourActivity);
 ListView lv = (ListView) findViewById(R.id.yourProjectListView);
 // get these from Service instead of being hardcoded
 // String[] yourProject = new String[] {"Blue", "Red", "Yellow", "Orange"};
```

```

 List<String> yourProject = service.getColors();
 ListAdapter fcAdapter = new ListAdapter ArrayAdapter<String>(this,
 R.layout.yourActivity_list_item, myColors);
 lv.setAdapter(fcAdapter);
}
...
@Override
// added so Activity can be resurrected by Service
protected void onResume() {super.onResume();
 fcAdapter.notifyDataSetChanged();} }

```

In `NewColorActivity.java`, populate it with (in green):

```

public class NewColorActivity extends Activity {
 EditText txtColorName;
 YourProjectService service; //get Service to survive Activity create/recreate
 @Override
 protected void onCreate(Bundle savedInstanceState) {
 super.onCreate(savedInstanceState);
 setContentView(R.layout.yourActivity);
 // get Service, so this app's data can survive Activity delete/recreate
 Application application = getApplication(); // get app > my app >
 YourProjectApplication thisApp = (YourProjectApplication) application;
 //String msg = thisApp.getStatusMsg(); // optional msg and
 //Log.w("in NewColorActivity()", msg); // optional logging >
 service = thisApp.getService(); // Service.
 txtColorName = (EditText) this.findViewById(R.id.txtFirstName);
 txtColorName.requestFocus();}
 @Override
 public boolean onCreateOptionsMenu(Menu menu) {
 // Inflate the menu; this adds items to the action bar if it is present.
 getMenuInflater().inflate(R.menu.yourActivityMenu, menu);
 return true;}
 @Override
 public boolean onOptionsItemSelected(MenuItem item) {
 switch (item.getItemId()) {
 case R.id.menu_myMenu:
 String newColor = txtColorName.getText().toString(); //get string typed by user
 service.addColor(newColor); // and add it to the list
 NewColorActivity.this.finish();
 return true;
 default:
 return super.onOptionsItemSelected(item);} }
}

```

## 9.5 To separate Service off to frontend/backend Model-View-Controller MVC

TODO: fill this in from Compare of C:\Users\EricPiehl\Downloads\FavoriteColors-1.1 v C:\Users\EricPiehl\Downloads\FavoriteColors-1.2.

## 9.6 All

--package (to move a package, right-click > Refactor > Move package).  
 --import has an uppercase Class name at the end.  
 --Javadocs  
 --Declaration

"." is the member operator.

To see methods, type "*object*."

**object.clone** method copies the contents.

**object = object** makes the other pointer point to the **same** object.

**Ctrl-space** = "help me": expand Sysout, etc.

**Ctrl-1** = "fix it": show lots of stuff.  
**Ctrl-/** = comment out or de-comment out.  
**Ctrl-Shift-F** = Format, auto-indent source.  
**Ctrl-2 undo** = undo something real fancy.  
**Ctrl-hover** = goes to that routine.  
Toggle markers and **Ctrl-K** helps finds.  
Help > Tips and tricks.  
templates.

If you see red wavy lines under something, hover > choose an **Import** option.

If your call "*cannot be resolved*", do a **Ctrl-Shift-O** or click Source > **Organize Imports** to organize your Imports.

If having **weird troubles**, do a **Clean**.

Use [Math.PI](#).

## 10 To compile or run your app

### 10.1 Non-Android

**Alt-Shift-X, J** run as Java App.

-OR-

Right-click source > **Run As** > **Java App**.

### 10.2 Android

If you haven't done so earlier:

- Start your Virtual Device via Eclipse > **Window** > **Android Virtual Device Manager**.
- Highlight the [Android Virtual Device you created earlier](#), click button **Start...** on right > **Launch**.
- If problems, look at pane **Console**, or "**LogCat**" for application errors.

Once the VD has started...

In Package Explorer:

- select *yourProject*, and **Ctrl-F11** or click green arrow **Run**, or
- right-click *yourProject* > **Run as** > **Android Application**.

*yourProject* may start, or just pop up under Applications.

If **bad**, see errors in panes **Problems** or **Console**.

If you see build errors, right click *yourProject* > **Android Tools** > **Fix Project Properties**, and retry.

If you see on pane **Console**:

The connection to adb is down, and a severe error has occurred.

You must restart adb and Eclipse.

Please ensure that adb is correctly located at 'path\jdk\platform-tools\adb.exe' and can be executed.

then reread [launching the Android Virtual Device window](#) you should have done earlier.

If you see on pane **Console** "**ActivityManager: Warning: Activity not started, its current task has been brought to the front**", then exit your app on the emulator, and retry.

If you get compile errors related to file (**R.class** or **R.java?**), do a clean & build within Eclipse. Never check in file (**R.class** or **R.java?**) into a version control system—it is different for everyone. Nor check in folders `bin`, `gen`, nor `assets`.

### 10.3 Build

Ant > Internal ant.

## 11 To debug your app

**TODO:** *write this part.*

More in [Tools](#) section Testing.

## 12 To beautify—make it look pretty

In each source file:

Click **Source** > **Clean Up...** will fix lots of optional stuff (Code Style tab: Use block in if/while/for/do statements=Always, Use parentheses around conditions=Always, Use modifier 'final' where possible=Always; Member Access tab: Use 'this' qualifier for method accesses=Always, Use declaring class as qualifier, Change all access through subtypes (indirect accesses), Change all access through instances; Unnecessary Code tab: Remove unnecessary casts, Remove unnecessary '\$NON-NLS\$' tabs).

**Ctrl-Shift-O** or  
click Source > **Organize Imports** will organize your **Imports**.

**Ctrl-Shift-F** Format or  
click Source > **Format** will auto-indent source, and make it look pretty.

## 13 To create Javadoc

Reruns can just right-click `doc\javadoc.xml` > Open Javadoc Wizard > Next > Next > Open generated index file in browser > Finish.

If first time:

Right-click your project > Export...

In the Export dialog, select Javadoc.

In the Generate Javadoc dialog, give it:

Javadoc command: your computer's javadoc.exe file.

Select your project and any subordinate files.

Private.

Use Standard Doclet in yourWorkspace\`yourProject`\doc.

Next.

Document title optional, perhaps "Javadoc of Eric Piehl's CO117 application, AssignmentThree."

Basic Options: select all

Document these tabs: select all.

No archives.

No Style sheet.

Next.

No overview.

No VM options.

No Extra Javadoc options.

Save the settings of this Javadoc export as Ant Script: `yourWorkspace\yourProject\javadoc.xml`.

Yes Open generated index file in browser.

Finish.

If Update Javadoc Location box seems reasonable, click Yes.

If you hit **Refresh F5**, you will see `javadoc.xml` appear in the Package Explorer pane doc folder.

Wait until Console pane show "<terminated> Javadoc Generation".

In batch: `F:\eclipse\workspace\HelloDate>javadoc -classpath . java`

## 14 To publish: create a .jar file

**TODO:** add **Android** section.

Reruns can just right-click ...jar > Delete, right-click ....jardesc > Create JAR.

If first time:

Refresh F5.

library jar dependent on

Right-click your project > Export...

In the Export dialog, select JAR file.

In the JAR File Specification dialog, give it:

Select the project source and default package.

Select Export generated class files and resource.

No select Export all output folders for checked project.

Select Export java source files and resources

No select Export refractoring for checked projects.

Select the export destination yourWorkspace\**yourProject**\PiehlAssignmentZero.jar.

There is no need to include the .classpath or .project files or any additional library jars (??).

No compress

No Add directory entries.

Click Next.

Select Export class files with compile errors

Select Export class files with compile warnings.

Save the description of this JAR in the workspace **yourProject**/PiehlAssignmentZero.jardesc.

Next.

From the JAR Manifest Specification dialog,

Select Generate the Manifest file and save it in the project as **yourProject**/MANIFEST.MF. Always use the Browse button to name the file.

Always select the Main() class using the Browse button.

Click Finish. The jar file will appear in the project.

To paranoia-check:

Run the app with:

```
java -classpath <directory location of the jar>/col17Utilities.jar;<directory location of the jar>/<YourLastName>Assignment<Number>.jar <MainClassName>
```

For example:

```
java -classpath
C:\Java\col17\code\AssignmentZero\lib\col17Utilities.jar;.\MishAssignmentOne.jar
Temperature
```

Or view with any zip utility, including the Windows compressed file or [7-Zip](#).

My favorite:

1. Copy the .jar to your favorite trash folder.
2. Rename the .jar to .zip.
3. Right-click > Extract to All... to somewhere in this trash folder.
4. Drill down this directory to see:
  - a. that the source and class files are all there, and
  - b. Open the manifest file META-INF\MANIFEST.MF in your favorite text editor, and see that it has a Main-Class specified.
5. If in a trash folder, leave it, cleaning out the folder occasionally. If live, rename it back to .jar.

## 15 To submit to Instructor

Submit to instructor with BB Course Tools > Digital Dropbox > Add File then Send File.

## 16TODO

**TODO:** Read discussions at Google+ communities for GR-JUG  
<https://plus.google.com/communities/103314203601881861807> or  
<https://plus.google.com/u/0/communities/103314203601881861807>. Set "Notifications on". Done 2013-08-20.

**TODO:** For week one 2013-06-18:

- Watch screencast of Android Xperience round 1: ListView Challenge (Favorite Color)  
[www.youtube.com/watch?v=va9oX5IITtU](http://www.youtube.com/watch?v=va9oX5IITtU). Or [www.youtube.com/v/va9oX5IITtU](http://www.youtube.com/v/va9oX5IITtU).

**TODO:** For week two 2013-07-16 EE Actionbarexperience on ActionBar and how to add custom menu items:

- See slides <https://docs.google.com/presentation/d/11RHs9yKUrFtSZGShMSKRRhCd2uwy5-V4CrmUM4ohgzpw/edit?forcehl=1&hl=en#slide=id.p13>.
- Watch video [www.youtube.com/watch?&v=fhi1\\_Fzlwfo](http://www.youtube.com/watch?&v=fhi1_Fzlwfo).

**TODO:** If needed, see "So, You Want to Develop Android Apps? Here's How to Learn"  
<http://makeuseof.com/tag/so-you-want-to-develop-android-apps-heres-how-to-learn/>.

At least one other **TODO:** sprinkled above.

**TODO:** convert other *\*.doc* to *X\*PDF.doc* and *\*.pdf*, including links from *index.html*:

- Foreach of 6 *\*.doc* ApacheMySQLPhp.doc, CSharp.doc, Java.doc, syncPalmOutlook64Bit.doc, tools.doc and VBA.doc:
  - rename to *X\*PDF.doc*
  - change *.doc* inside to *.pdf*, perhaps with a [www.ericpiehl.com/](http://www.ericpiehl.com/)
  - style Title
  - Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License
  - Save As *\*.pdf*
- Update *index.html*: lowercase, change *.doc* to *.pdf*.
- FTP up, delete 6 or more old *\*.docs*.

-End.- [send comments to the author](#).