How to Write Your Own Eclipse Plug-ins

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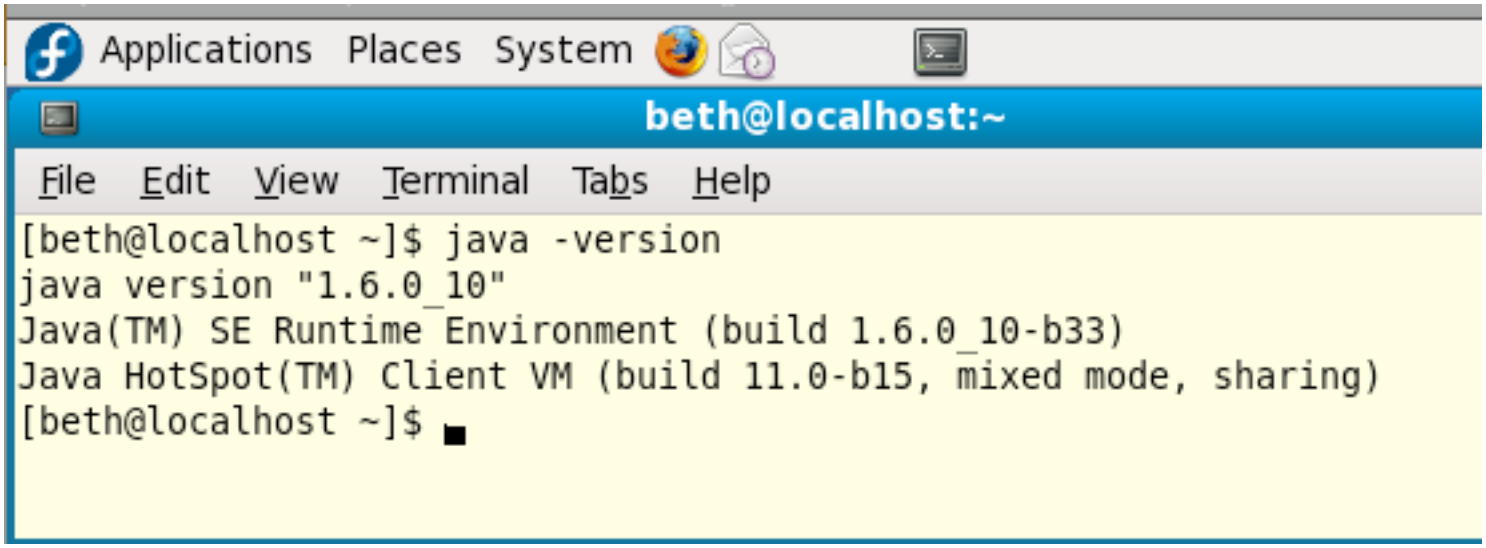
Before Attending

- Make sure you have a Java JRE
  - At least 5 (aka 1.5)
  - IBM or Sun's (not GCJ included with Linux)
- Download Eclipse *Classic* for your platform
  - eclipse.org/downloads
    - Save the archive file, you'll need it again in the tutorial
  - Current release "Galileo" is Eclipse 3.5

Java

- Linux: make sure you have Sun or IBM Java: Java HotSpot == Sun



- Either Java 1.5 or 1.6 is ok (*Not* `gcj`!)

Outline

1. Eclipse overview and Installation
2. Installing extensions (“Plug-ins”) via Update Manager
3. New Plug-in Project Wizard, create an Action button
   - Plug-in component tour: Manifest, code, resources, etc.
   - Launching (“self-hosting”) – testing your plug-in
4. More extensions: adding a view … modify code … run debugger
5. Writing Help for your plug-in; including HTML and XML editing
6. Packaging your plug-in(s): Eclipse features; Update Sites & testing
7. Handmade extension: Word Counter in editor toolbar -- If time permits
8. Source code analysis: C/C++ example – and eclipse.org source code repository exploring -- If time permits
9. Summary, References, Where to go from here

Hints and Tips Along the Way

Eclipse: Overview

- Open Source IDE & Development Platform
  - Platform-independent
  - Originally donated by IBM in 2001; Foundation est. in 2004
  - Now over 180 vendor members (more than IBM)
    - 15 Strategic members – sit on Eclipse Foundation Board
    - http://www.eclipse.org/membership/showMembersWithTag.php?TagID=strategic
  - Now over 33 Eclipse projects in simultaneous release
    - Over 100 projects overall; more from independents
  - IDE (develop *with* Eclipse)
    - *And Platform (develop and deliver your Application on top of Eclipse)*

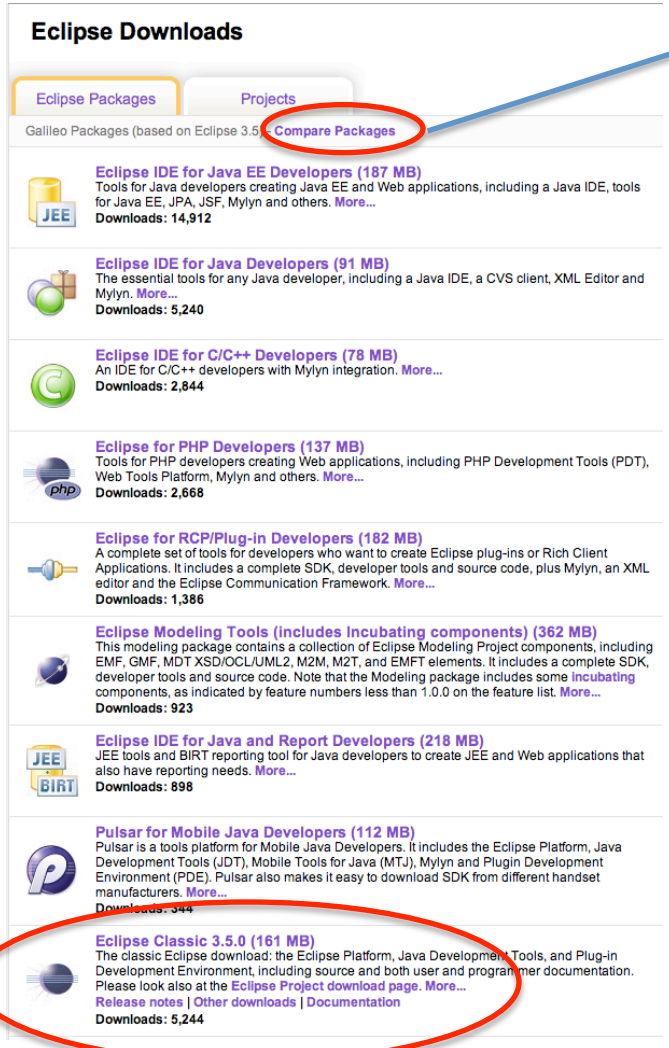
Platforms & Releases

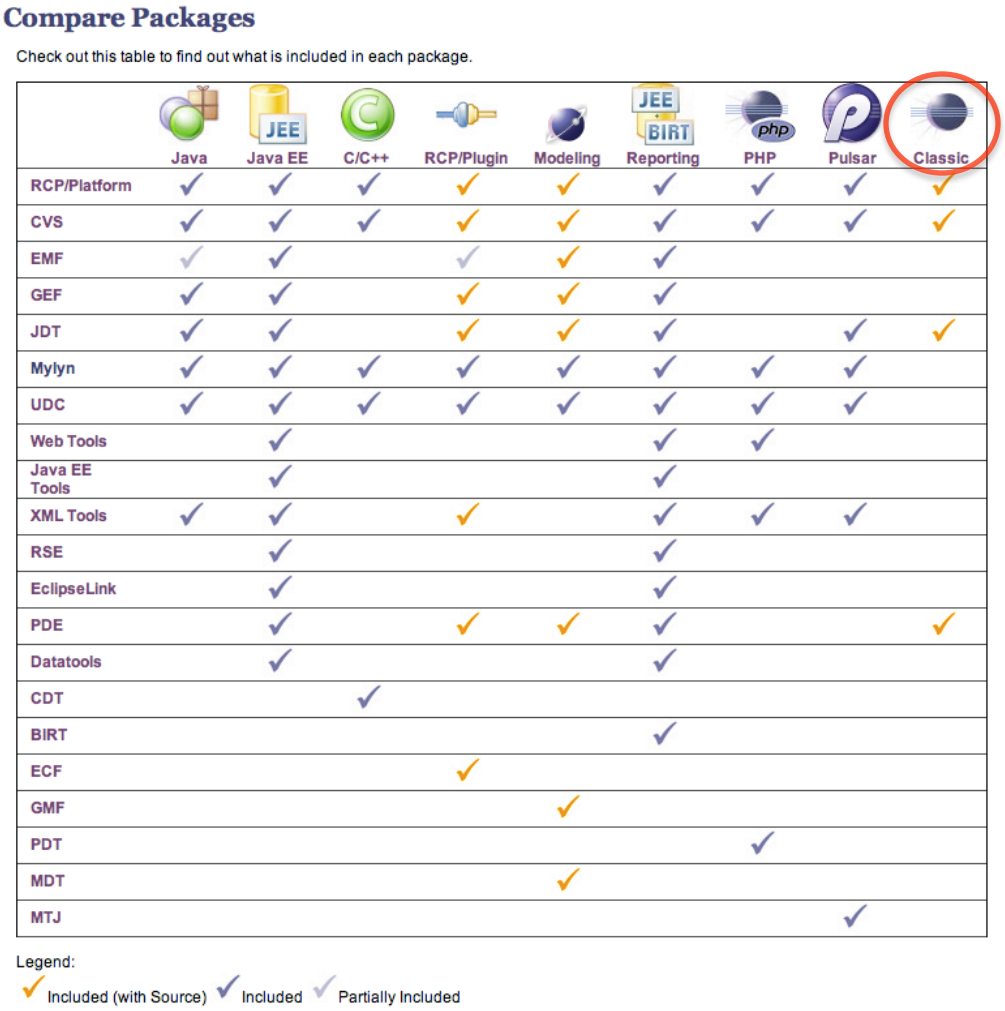
Eclipse SDK ⊞	
Status	**Platform**
✔	Windows (Supported Versions)
✔	Windows (x86_64) (Supported Versions)
✔	Windows (x86/WPF) **early access** (Supported Versions)
✔	Linux (x86/GTK 2) (Supported Versions)
✔	Linux (x86/Motif) **testing only**
✔	Linux (x86_64/GTK 2) (Supported Versions)
✔	Linux (PPC/GTK 2) (Supported Versions)
✔	Linux (S390/GTK 2) **early access** (Supported Versions)
✔	Linux (S390x/GTK 2) **early access** (Supported Versions)
✔	Solaris 10 (SPARC/GTK 2)
✔	Solaris 10 (x86/GTK 2)
✔	HP-UX (IA64_32/Motif)
✔	AIX (PPC/Motif)
✔	Mac OSX (Mac/Cocoa) (Supported Versions)
✔	Mac OSX (Mac/Cocoa/x86_64) (Supported Versions)
✔	Mac OSX (Mac/Carbon) (Supported Versions)
✔	Source Build (Source in .zip) (instructions)
✔	Source Build (Source fetched via CVS) (instructions)

- Releases
  - 2006: 3.2 Callisto
  - 2007: 3.3 Europa
  - 2008: 3.4 Ganymede
  - 2009: 3.5 Galileo ←

Eclipse Packages

http://eclipse.org/downloads





Parallel Tools Platform

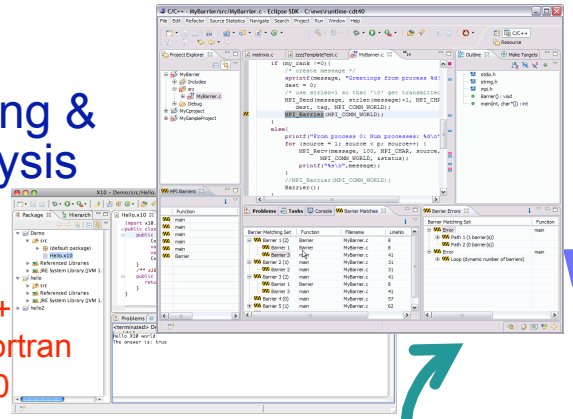
My committer status involvement with Eclipse:

- Eclipse.org/ptp
- Tools for High Performance Computing
- IBM funding from DARPA
- Develop, Analyze, Run, Monitor, Debug, Tune, Repeat

Eclipse and PTP: Parallel Tools Platform

http://eclipse.org/ptp

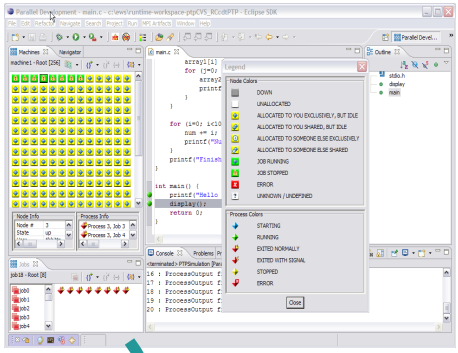
- Bring richness of commercial development tools to the parallel programmer
- Open and extensible platform to encourage further development



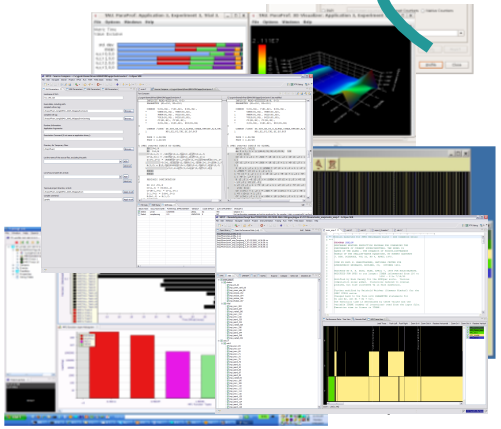
Coding & Analysis

CDT: C/C++
Photran: Fortran
X10DT: X10

Productivity of Dev. On local machine

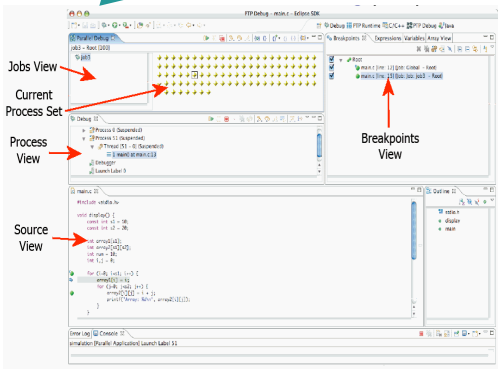


Building
Launching
Monitoring



Performance Tuning
External Tools Framework (ETFw)

Remote Host



Parallel Debugging

Eclipse Installation

- Download from eclipse.org/downloads
  - You need a Java JRE (at least JRE 5)
    - *Not GCJ distributed with Linux! Get Sun or IBM.*
  - This tutorial is based on Eclipse 3.5 ("Galileo")
  - Many distributions – we'll use "Eclipse Classic"
  - Other distros target different dev. Audiences
    - C/C++, Web, Java, Java EE, etc.
  - Download and unzip/untar
    - That's it!
    - Executable: eclipse or eclipse.exe

Hints and tips: Multiple installations

You can easily have multiple installations of eclipse.

Eclipse extracts into a single dir: 'eclipse'

Put that wherever you want

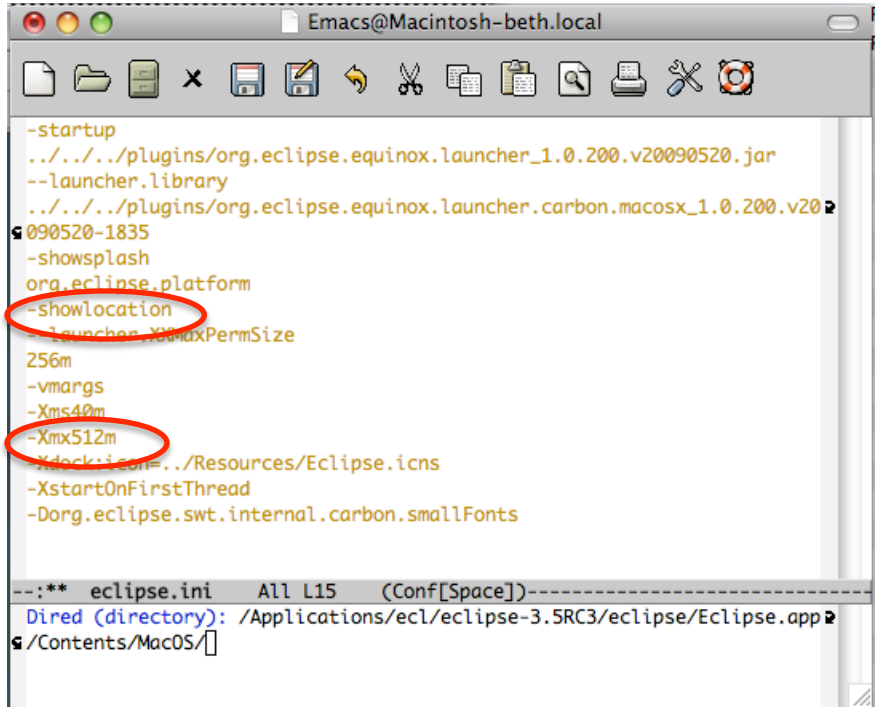
- */Users/beth/ecl/eclipse-3.5/eclipse*
- */Users/beth/ecl/eclipse-3.4/eclipse*
- */Users/beth/ecl/eclipse-3.3/eclipse*

- *Right now I have ____ (how many?) on my machine*
  - *What can I say, I'm a pack rat ☺*

Hints and tips: eclipse.ini

Before Launching

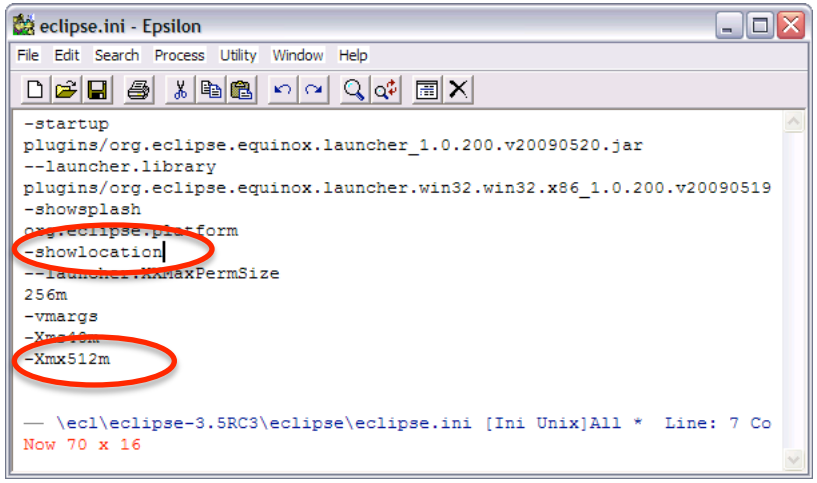
- *Hints and Tips*
  - *Edit the eclipse.ini file to set defaults. Suggestions:*
    - *Change heap size from -Xms256m to –Xmx512m*
    - *Set -showlocation to show workspace name in title bar*
      - *Don't split another arg/value pair!*
- *Eclipse.ini location*
  - *Mac: eclipse/Eclipse.app/Contents/MacOS/eclipse.ini*
  - *Win/Linux: eclipse/eclipse.ini*



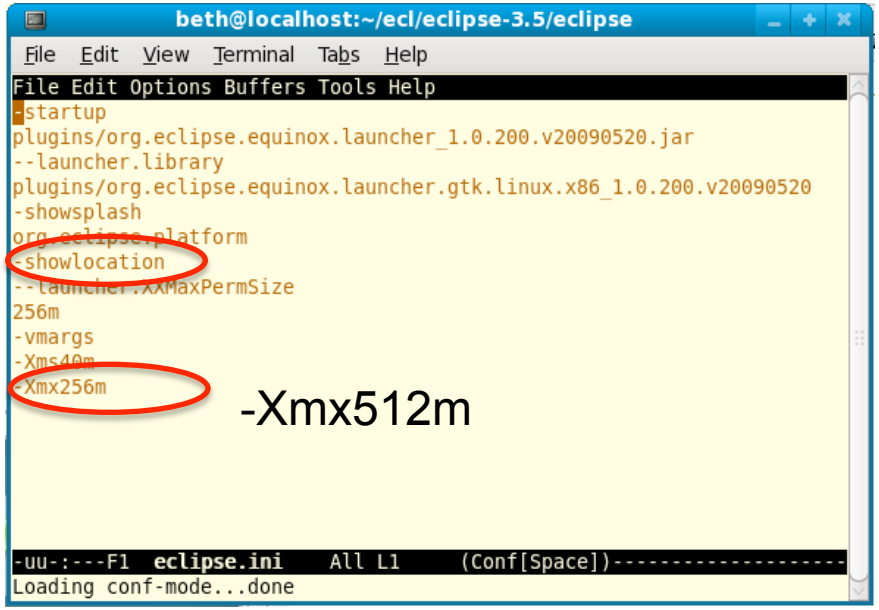
See next slide for Windows/Linux

Hints and tips: eclipse.ini

Windows



Linux

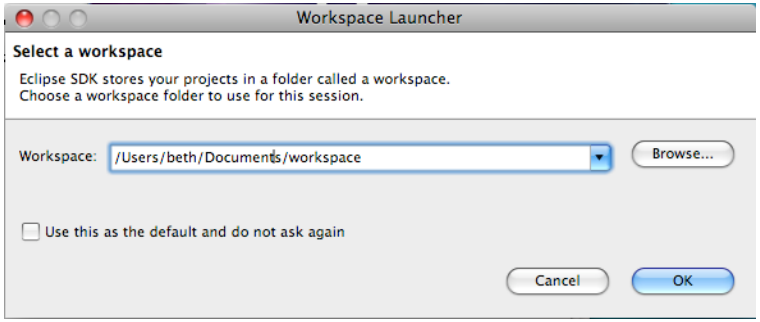


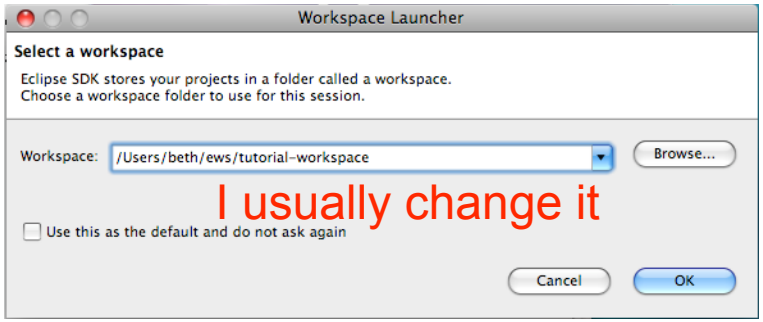
Launch Eclipse

- ./eclipse or double-click executable
  - Warning: to assure environment is translated to the executable, you may want to run from command line (e.g. Mac OS X)
    - Or edit: environment.plist
  - Whatever your environment, make sure Java is in your path

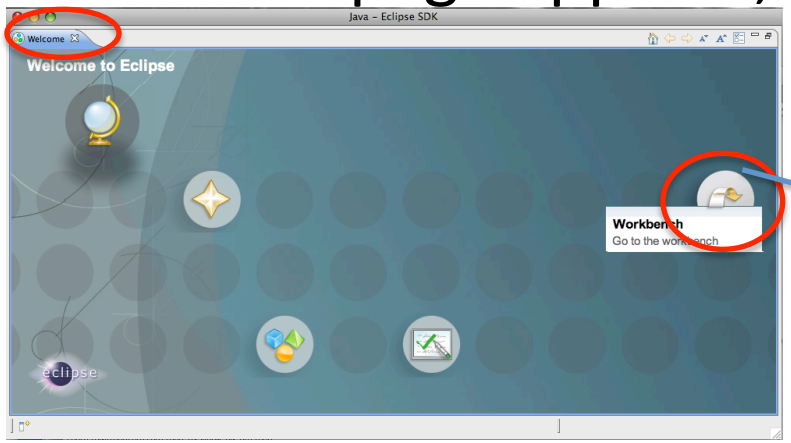
Launch Eclipse

- Launch eclipse; default workspace probably OK



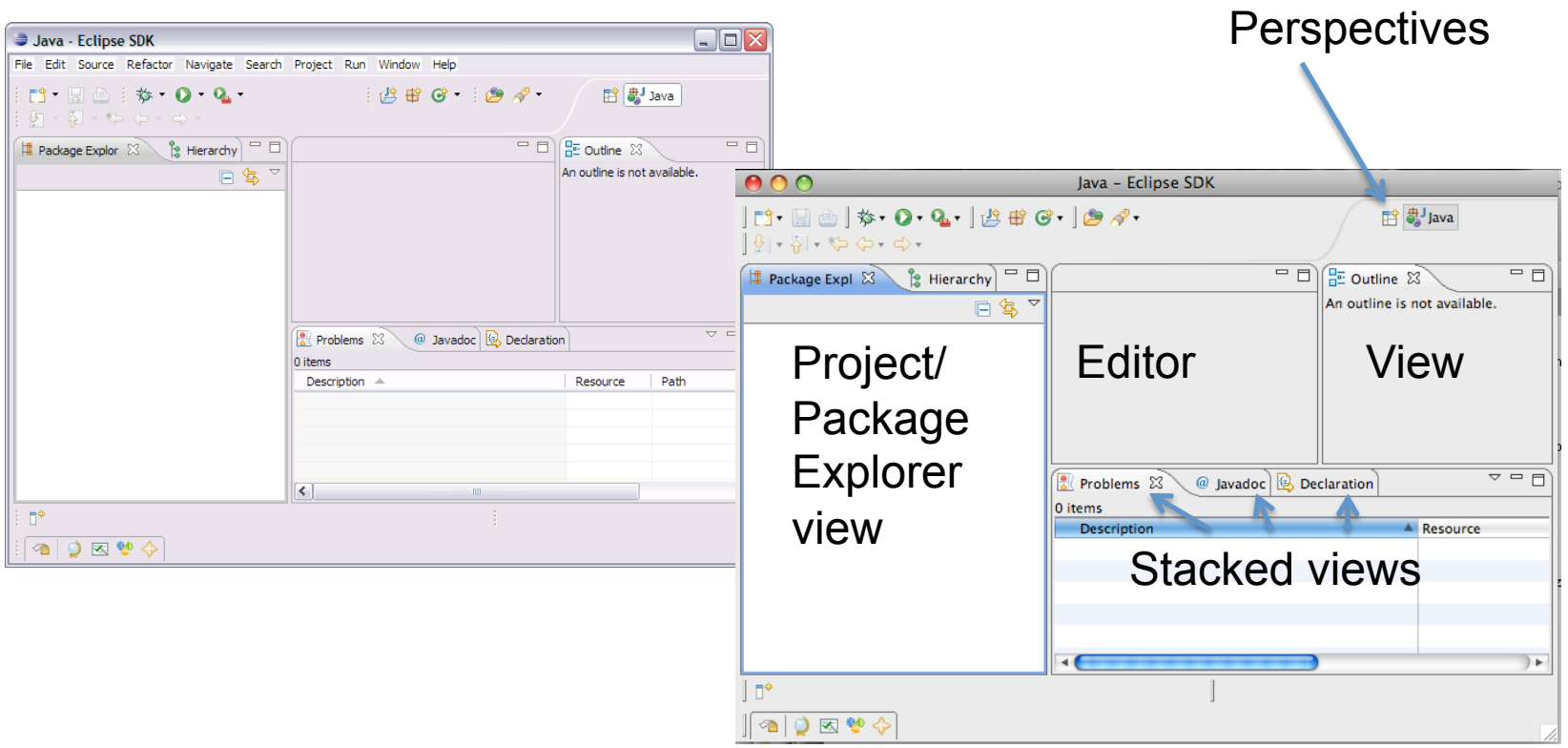


- Welcome page appears; go to workbench



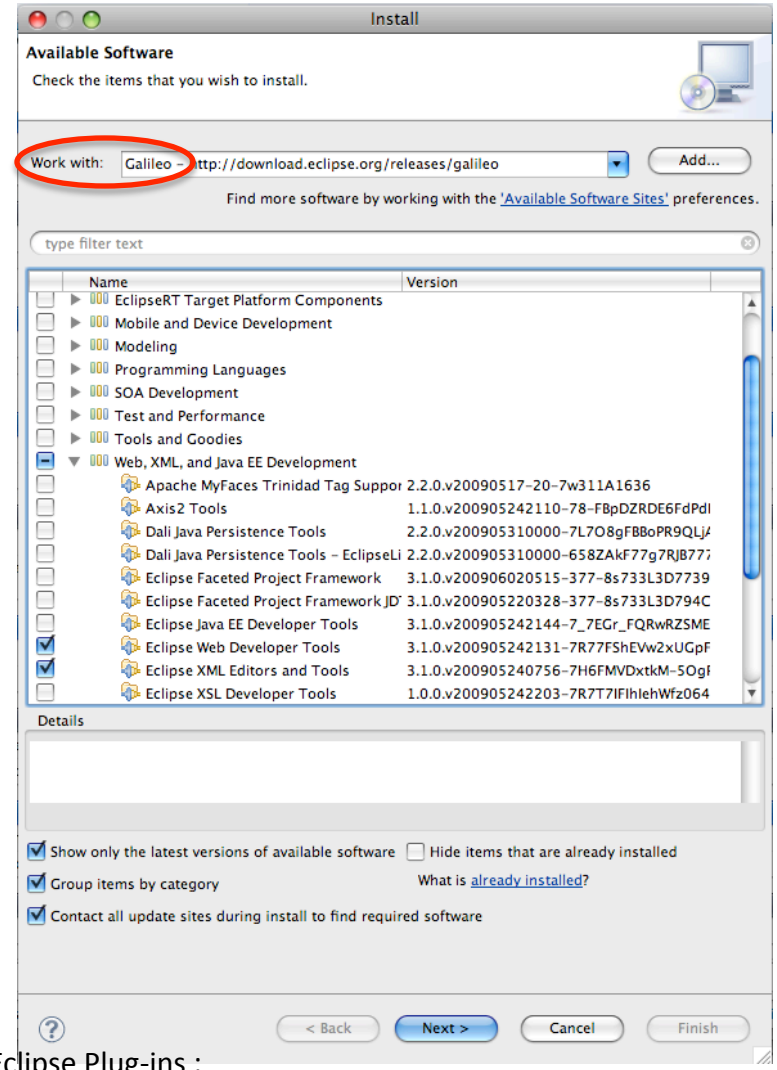
- Close Welcome tab
  or
- Select "Go to workbench" icon

Eclipse Workbench



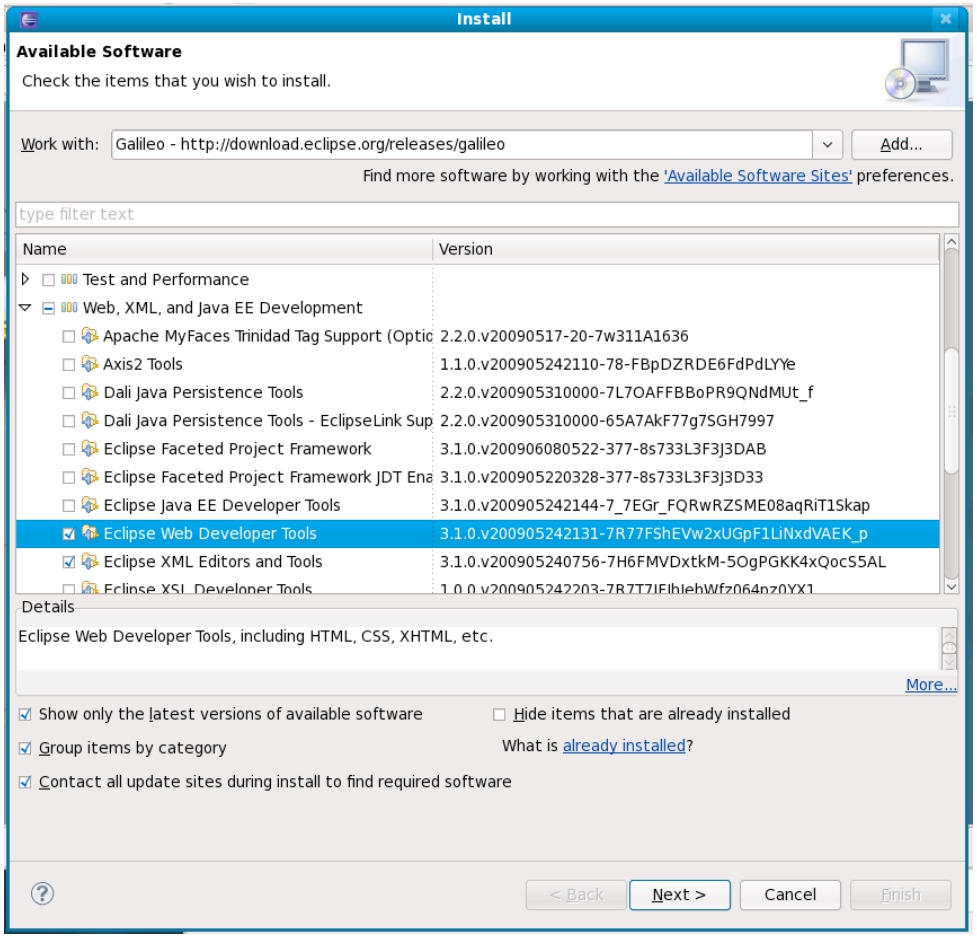
Installing extensions

- Install other eclipse tools
- Help > Install New Software..
- No need to do anything now.



Installing extensions

- Linux Update Mgr
- Manual Installation:
- dropins/ folder



What is a plug-in?

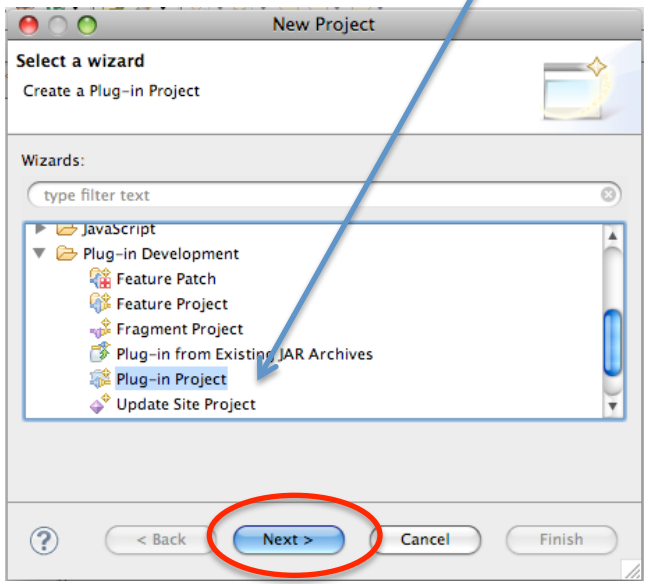
- An Eclipse plug-in is a unit of eclipse function
- It “extends” the eclipse workbench.
- Has a special type of manifest and (usually) a plugin.xml file
- May depend on other plug-ins
- Can (usually does) contribute to other plug-ins
- Lots of plug-ins already exist (LOTS)
  - http://www.eclipseplugincentral.com/
  - http://eclipse-plugins.info *and* on http://eclipse.org

Eclipse examples

- We will develop Eclipse plug-ins in this tutorial via the built-in example wizards
- How much can you learn from “hello world” ?
  - A lot, actually
  - Basic plug-in structure, how to hook in, where to put your code, what your code can do
  - Then we’ll go from there.

New Plug-in project

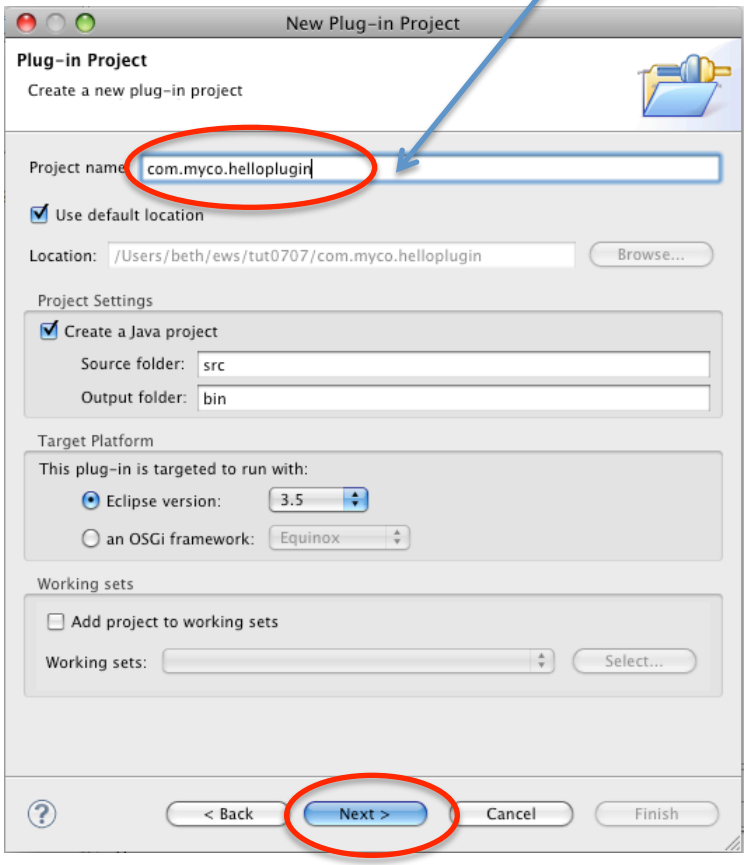
- File > New > Project…
- Under Plug-in Development
  - Select Plug-in Project; Next >



Give it a name, e.g.

- com.myco.helloplugin

Next >

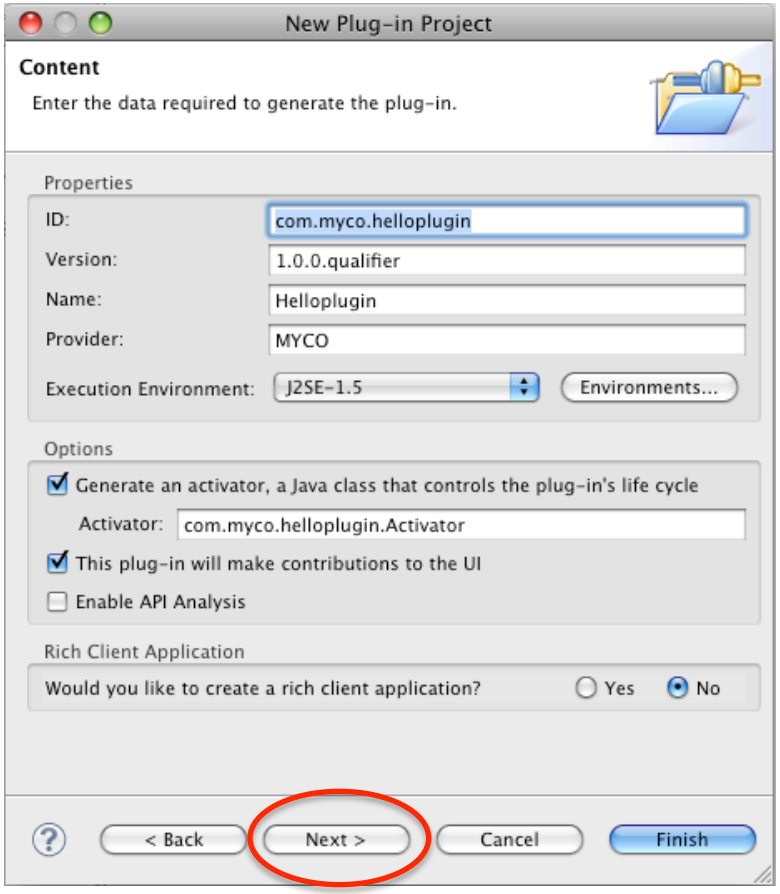


Hints and tips:

Make the project name the base package name - Helps with linking up IDs (can be difficult to get right later)

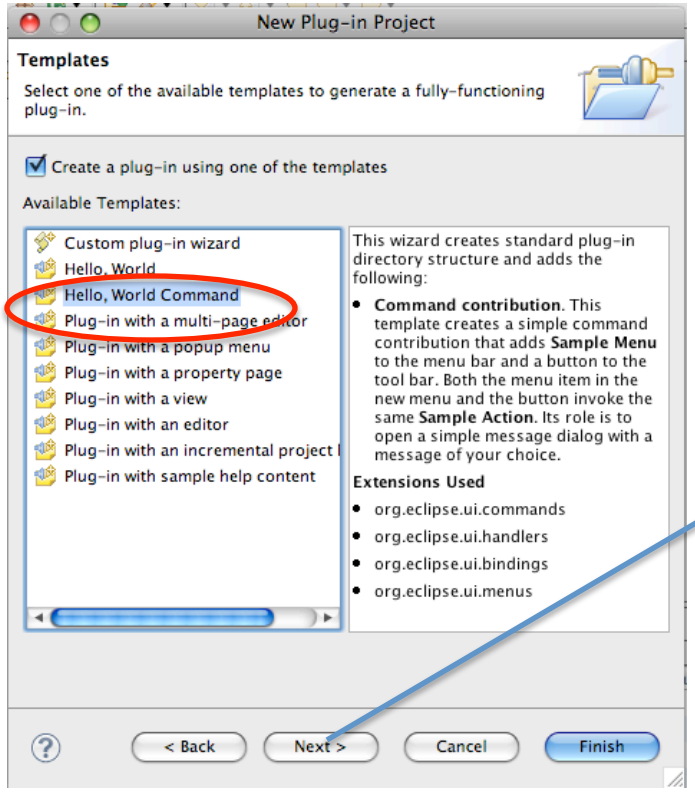
New Plug-in project (2)

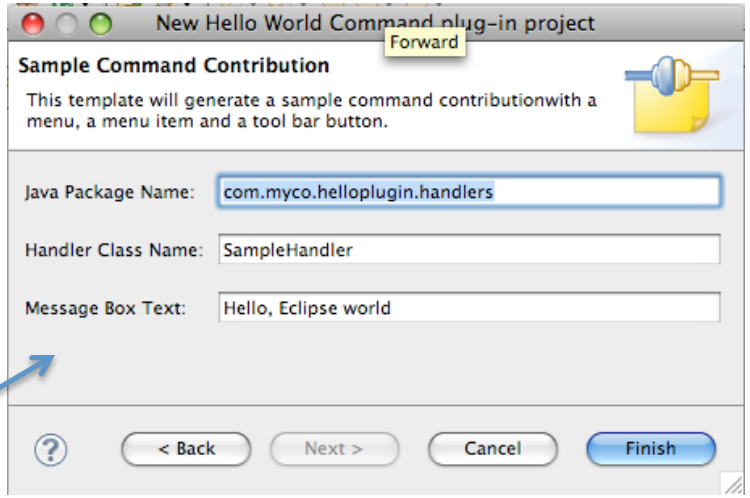
- Content page
- Defaults are OK
- Next >



Plug-in templates

- Choose “Hello, World Command” Template





•Hit Finish (or Next > then Finish)

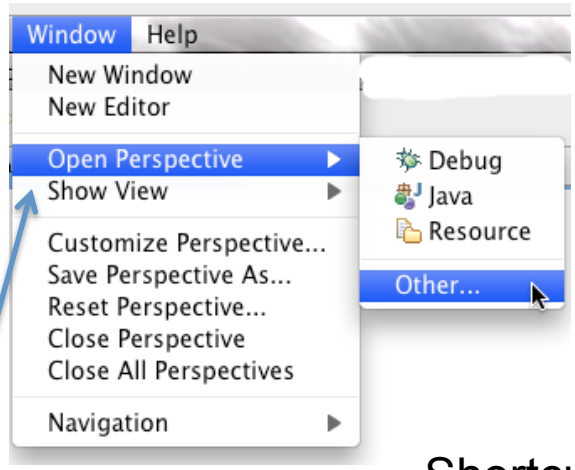
Switch Perspectives

- Accept switch to Plug-in Development Perspective

- If you were already in the Plug-in Development Perspective, you won't see this dialog.

Perspectives

Perspectives provide combinations of views and editors that are suited to Performing a particular set of tasks.



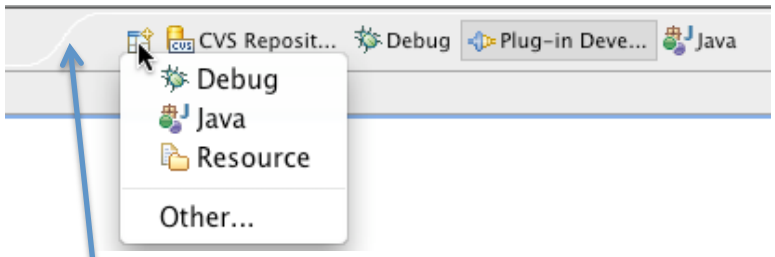
Hints and tips:

You can easily switch

between perspectives via:

1. *Window > Open Perspective, or*
2. *Click the "Open Perspective" button on the shortcut bar, or*
3. *Click one of the perspective icons in the shortcut bar*

Shortcut bar

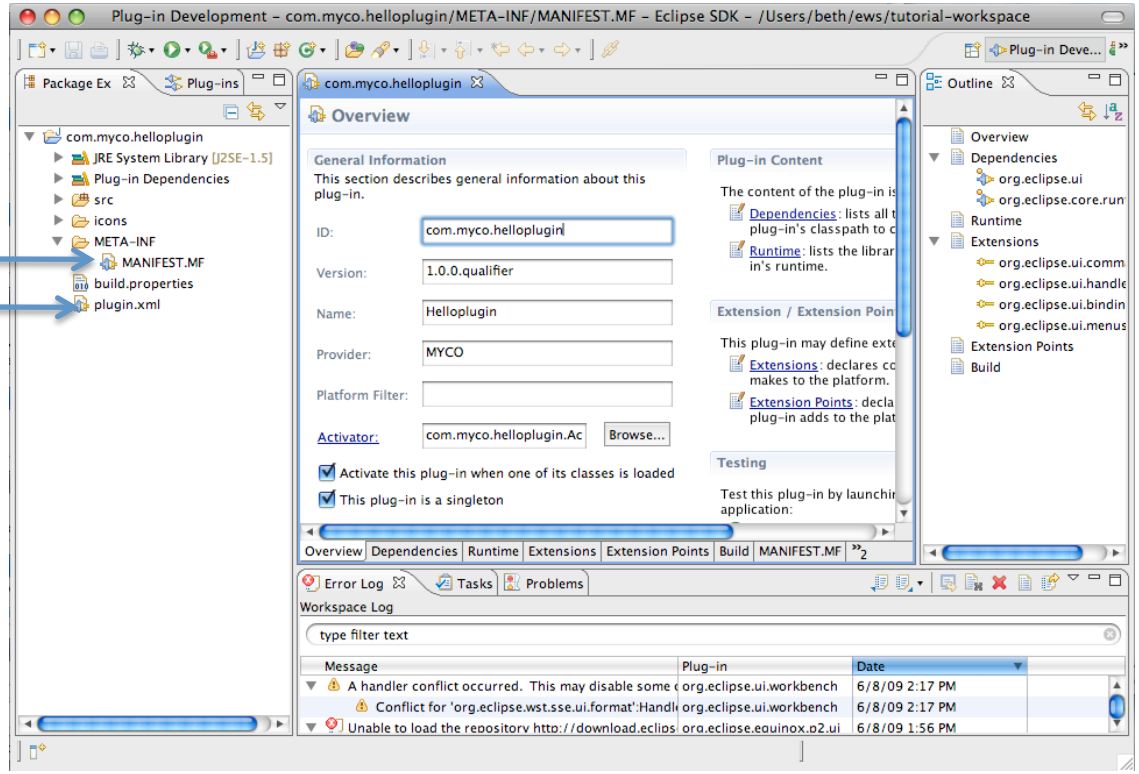


You may need to drag the shortcut bar's left edge to make it wider, in order to show all the perspective icons that have been active.

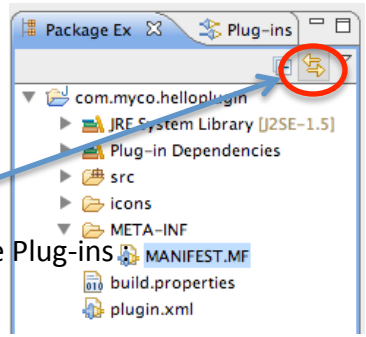
Simple Plug-in created

- Edit the plug-in manifest: MANIFEST.MF
  - *basics*

  plugin.xml
  - *extensions*
- See XML of manifest
- OSGi vs plug-in extensions



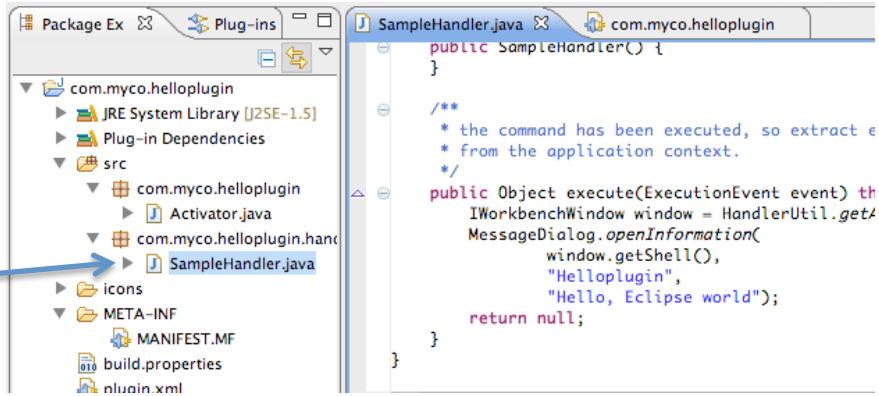
Hints and Tips:
To link current editor with location in project:



Link with editor

Plug-in source code

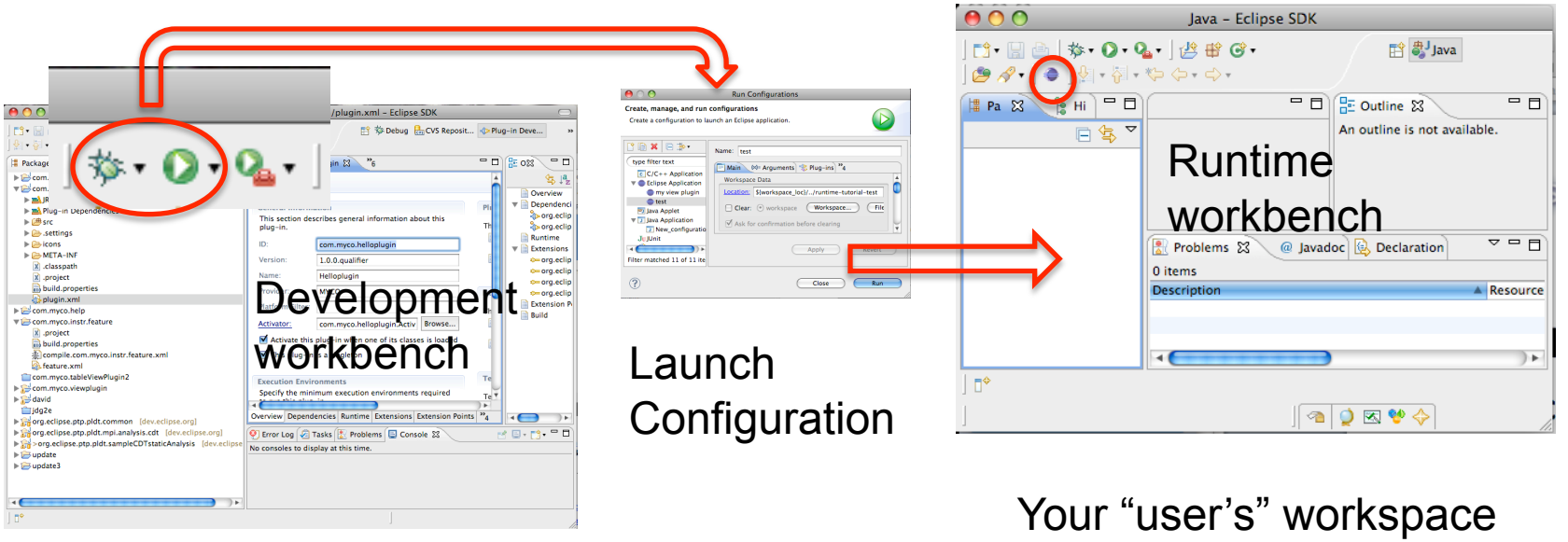
- Activator controls plug-in life cycle
- Java code for "Hello world" action
- Double-click file to open in editor



Enough of a tour. Let's run with our new extension!

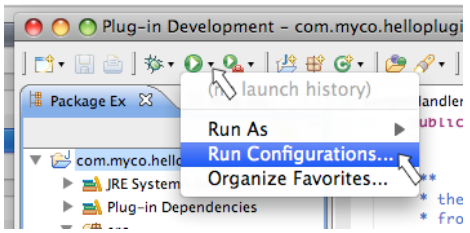
Running/Testing plug-ins

- "Self-hosting"- launch another instance of Eclipse
- Runtime workbench launches with (usually) everything in the development workbench, plus the new plug-ins being developed

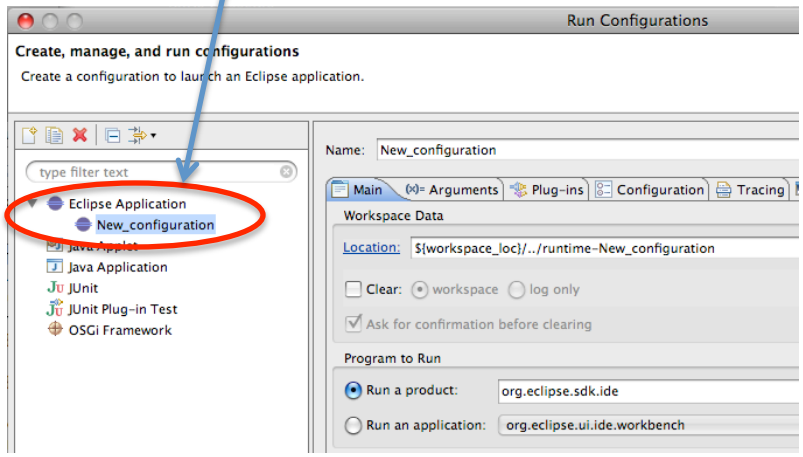


Run

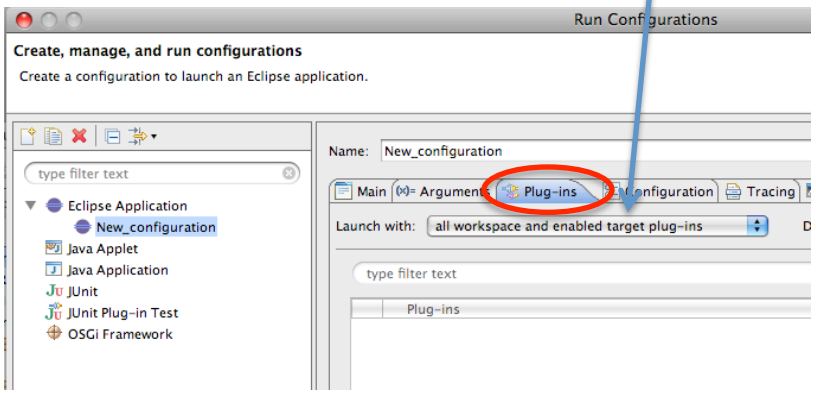
- Run > Run Configurations…
- New Eclipse Application



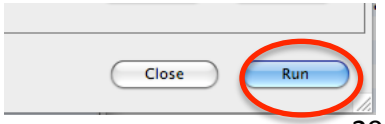
Or use Run icon menu



On Plug-ins tab
Default selection is what we want:
Launch with all … plugins



Run!

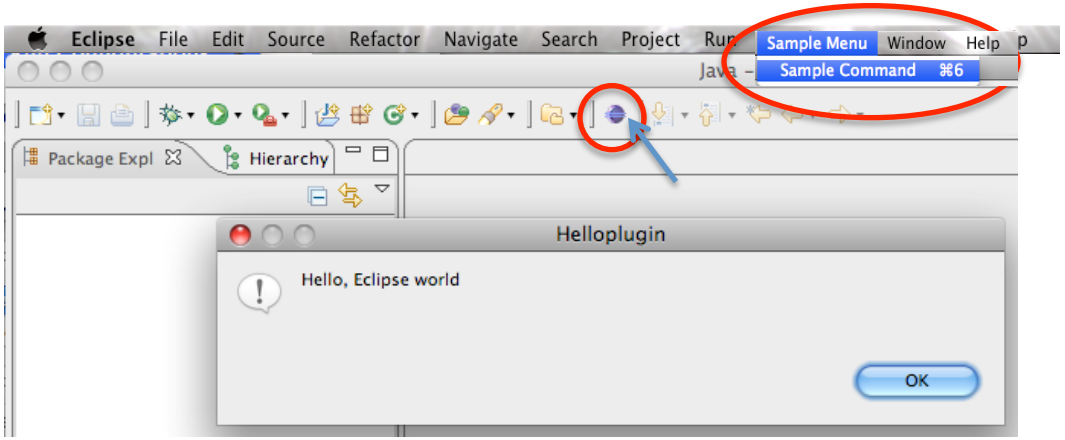


Running your new plug-in

- Another instance of Eclipse is launched
- Go to workbench

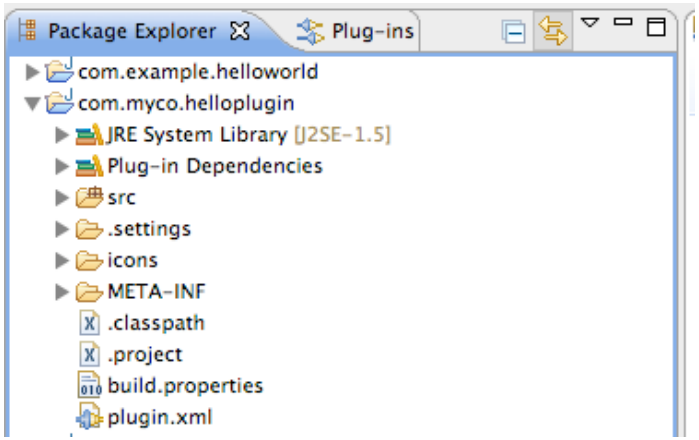
Execute:

- Toolbar icon
  or
  Menu



Basic plug-in tour

- Manifest
  - MANIFEST.MF and plugin.xml
- Java code
  - Usually under /src
- Other resources
  - Many are optional
  - Icons, html files, etc.



You're done!

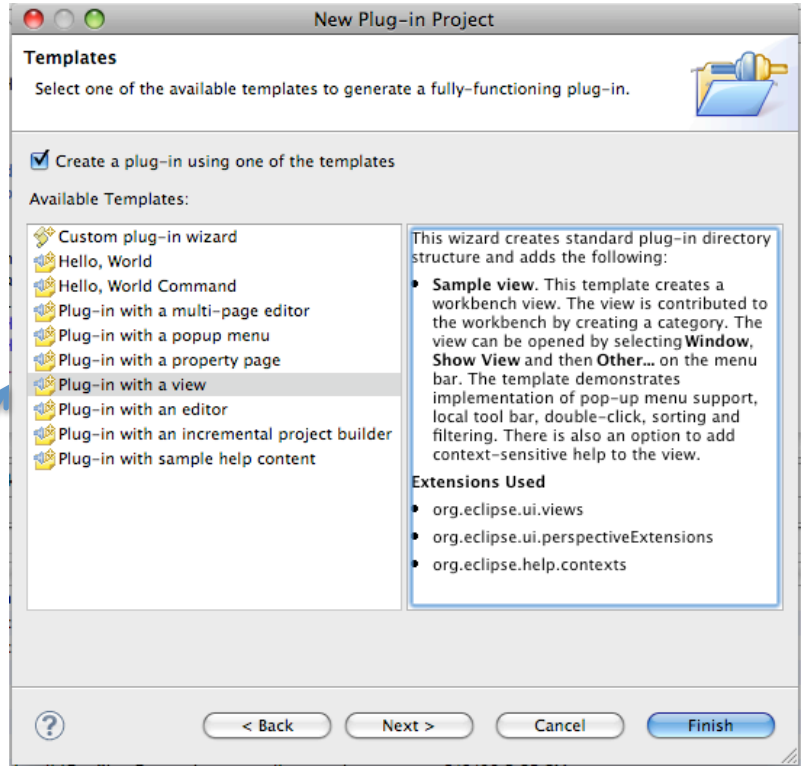
- You have now written your first Eclipse plug-in!
- You're done!
- … Just kidding!
- Close the runtime workbench

Next project

- Let's make another plug-in that creates an eclipse view
- This will use more of the
  - Eclipse extension points (how eclipse calls *your* code) and
  - APIs (the java code you write that does eclipse stuff in your plug-in)
  - And we'll modify the java code

New project

- New Project, Plug-in project
- Name:
  com.myco.viewplugin
  - *Project name = package root = plug-in id. Getting this set up at project start will save you headaches later.*
- Next, Next
- Choose “Plug-in with a view”
- Next, Finish



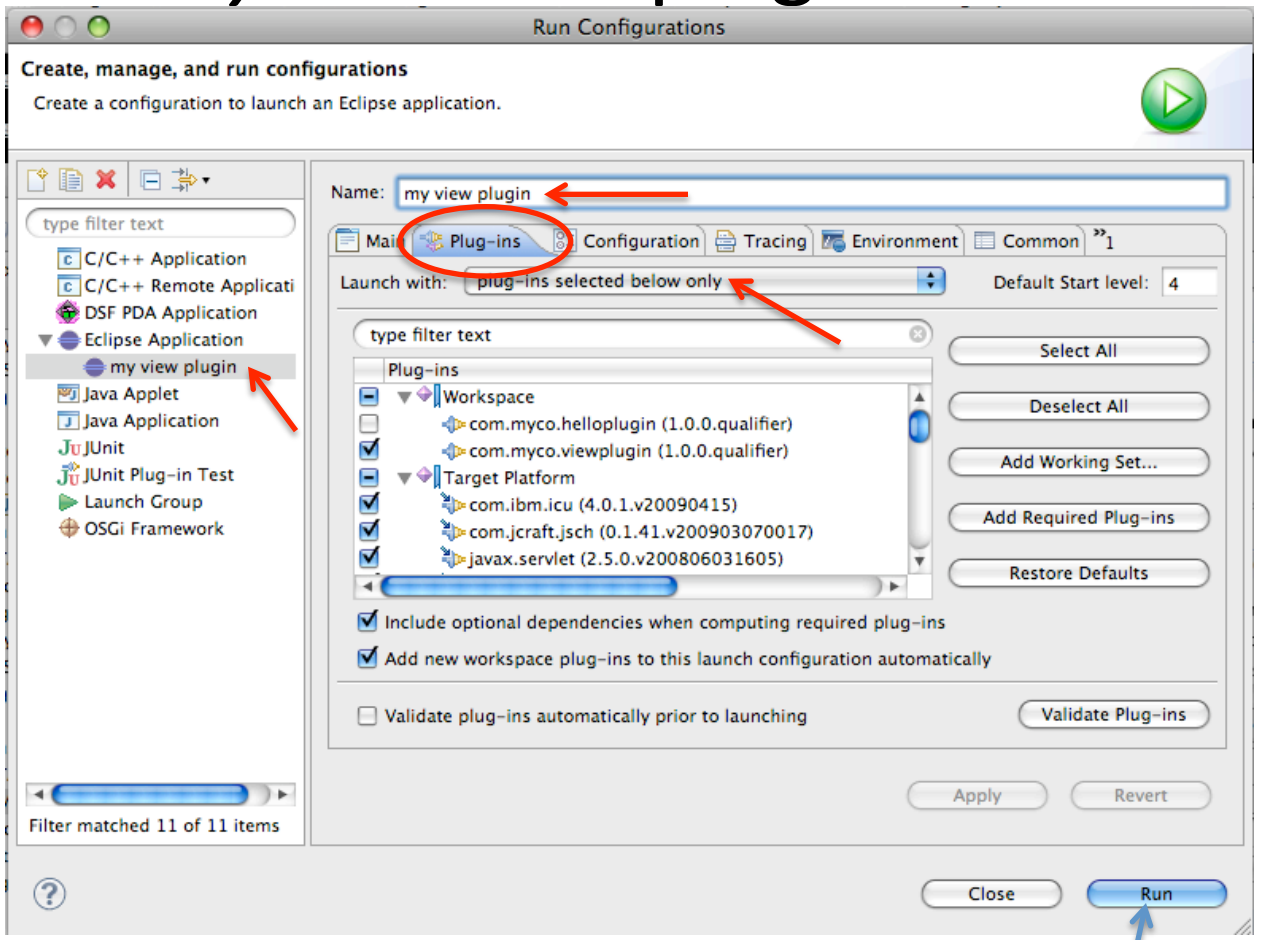
Run

- Run with *just* the new plugin
- Run > Run Configurations
  - New Eclipse application
  - Plugins tag: Launch with: plugins selected…only
  - Under Workspace, select the viewplugin
    (See next slide)

Run configuration for launching *only* the view plug-in

Run with *just* the new plugin

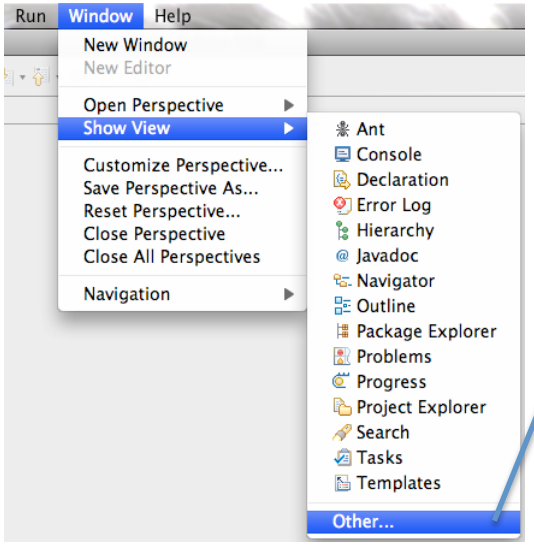
- Run >
  Run Configurations
- New Eclipse application
- Plugins tab:
  - Launch with: plugins selected…only
  - Under Workspace, select the viewplugin

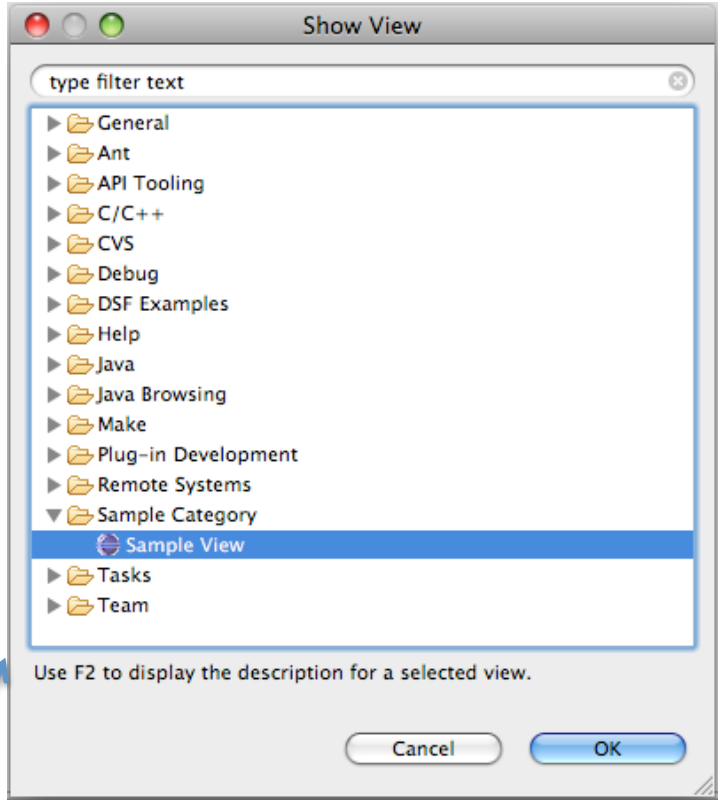


Run

Bring up New View

- In new Eclipse that launches,
- Window
  - > Show View
  - > Other…

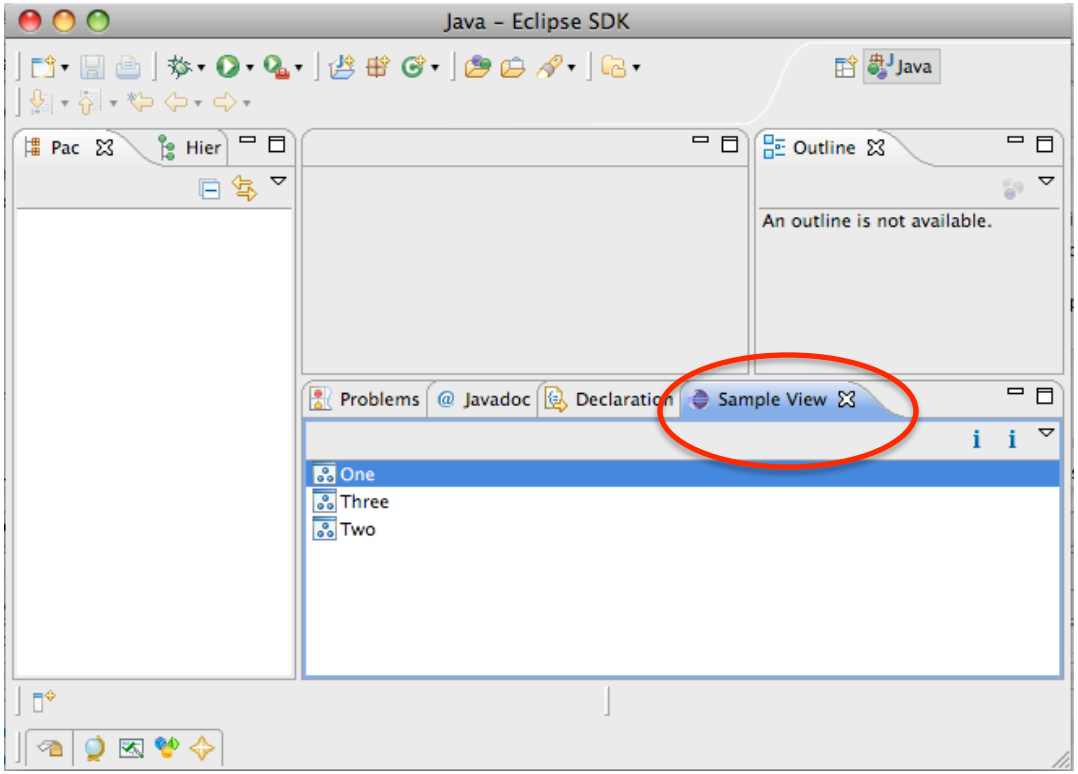




Our New View

- What functions does it do?
- Click on stuff
- Close the runtime workbench

Runtime workbench



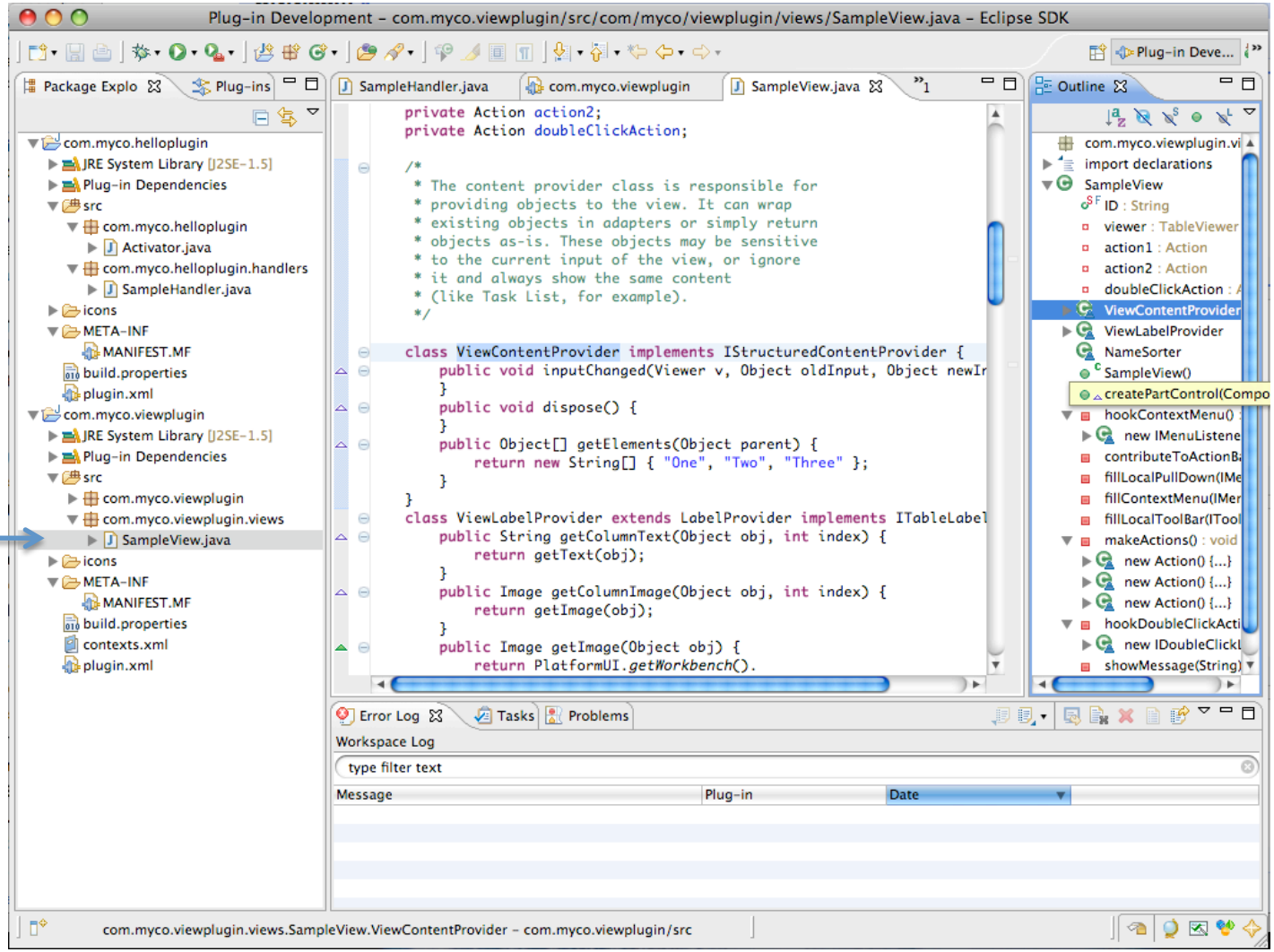
Look at code

Back in the Development workbench…

- SampleView includes Jface frameworks:
  - ContentProvider: the objects that represent items in the view
  - Label Provider: How to display the objects
  - ViewPart: the subwindow
  - Viewer: the widget for displaying objects
    - TableViewer used here
- *Java code inspection*
  - *Hover, hyperlink, ctrl-space (Mac cmd-space)*

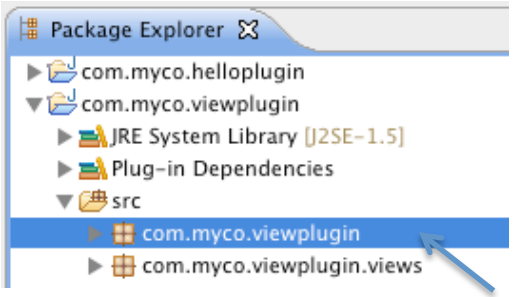
See next slide

Code for new view



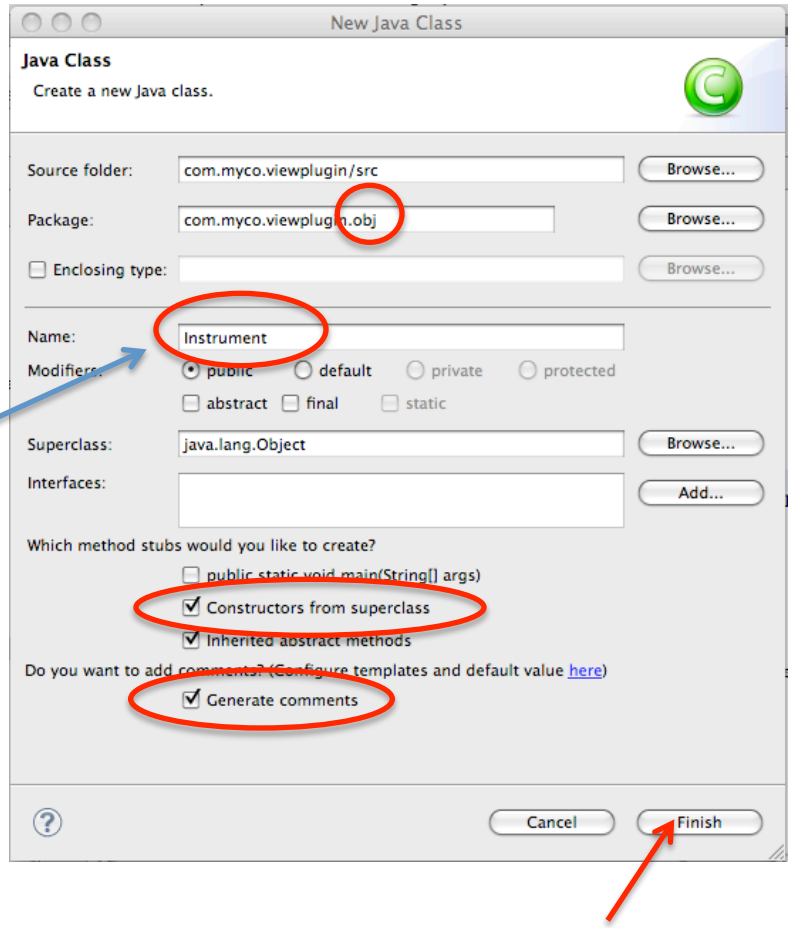
New Class

- In Package Explorer under the new project, Select package “com.myco.viewplugin”



(This makes the new class wizard automatically fill in some values)

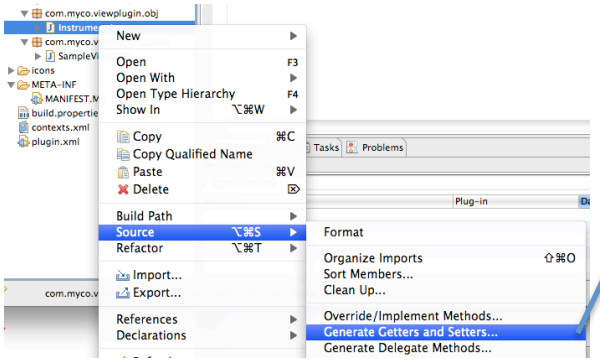
- File, New, Class
  - Name: Instrument
  - Package: com.myco.viewplugin.obj
  - Generate comments
  - Constructors from superclass
  - Finish

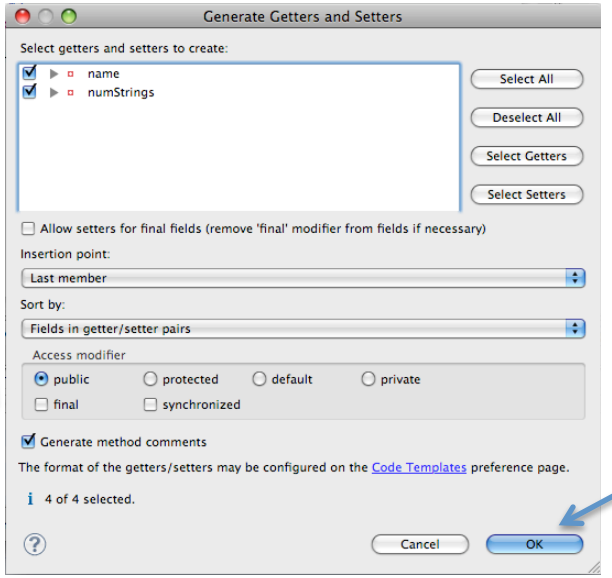


Edit code for Instrument

- Add name, numStrings
- Add getters/setters:
  - Select 'Instrument.java' file
  - Context menu:
    - Source >
      Generate getters and setters

```
public class Instrument {
    private String name;
    private int numStrings;
```





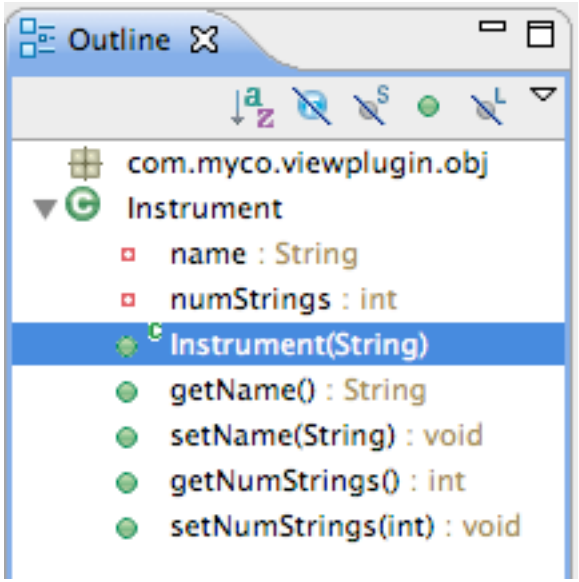
•Select all
•Insertion point last member
•Generate method comments; OK

Edit code for Instrument

Add String arg to constructor; set name

```
public Instrument(String name) {
    this.name=name;
}
```

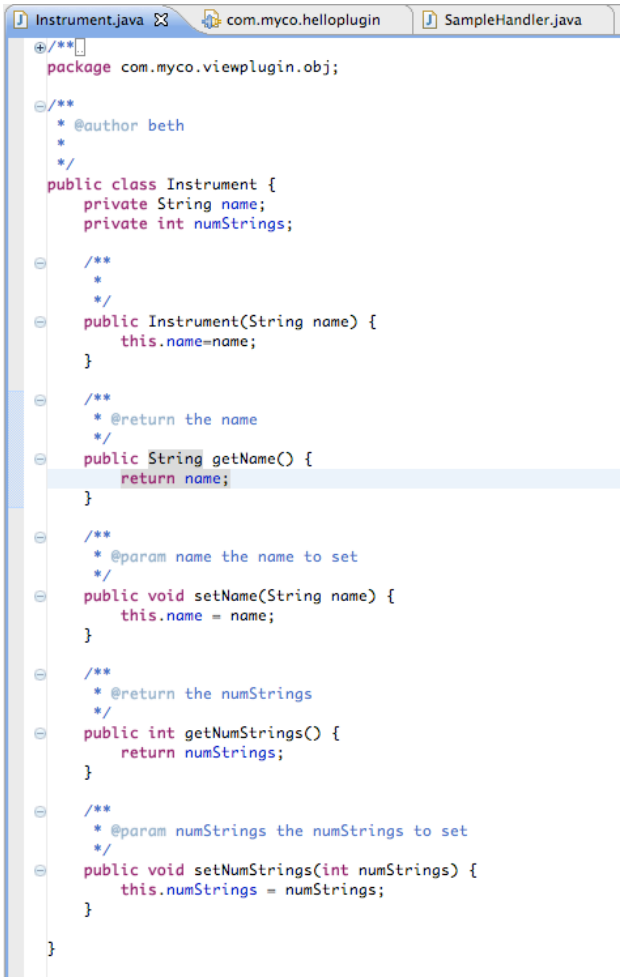
- Save file
- The outline so far



Instrument.java

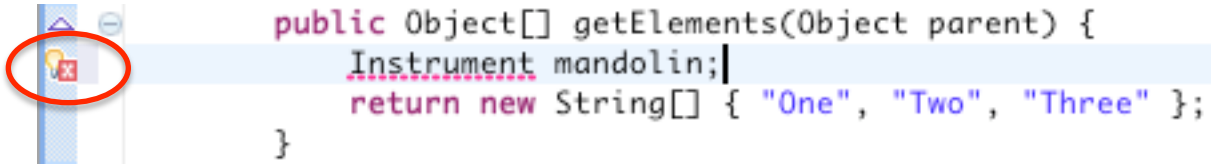
so far

```
// w/o comments:
package com.myco.viewplugin.obj;

public class Instrument {
private String name;
private int numStrings;
public Instrument(String name) {
this.name=name;
}
public String getName() {
return name;
}
public void setName(String name) {
this.name = name;
}
public int getNumStrings() {
return numStrings;
}
public void setNumStrings(int numStrings) {
this.numStrings = numStrings;
}
}
```

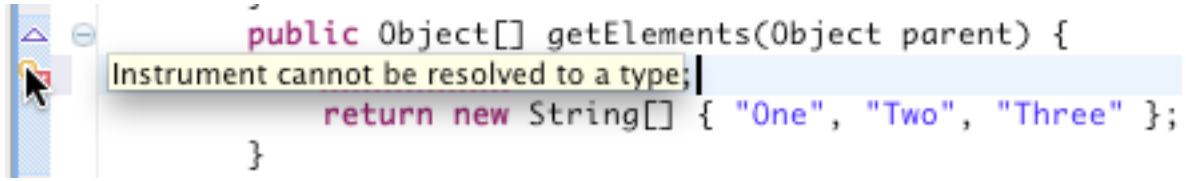


Use new objects in ContentProvider

- Edit SampleView.java (it's under com.myco.viewplugin.views package)
- In ViewContentProvider modify getElements() add 'Instrument mandolin;'



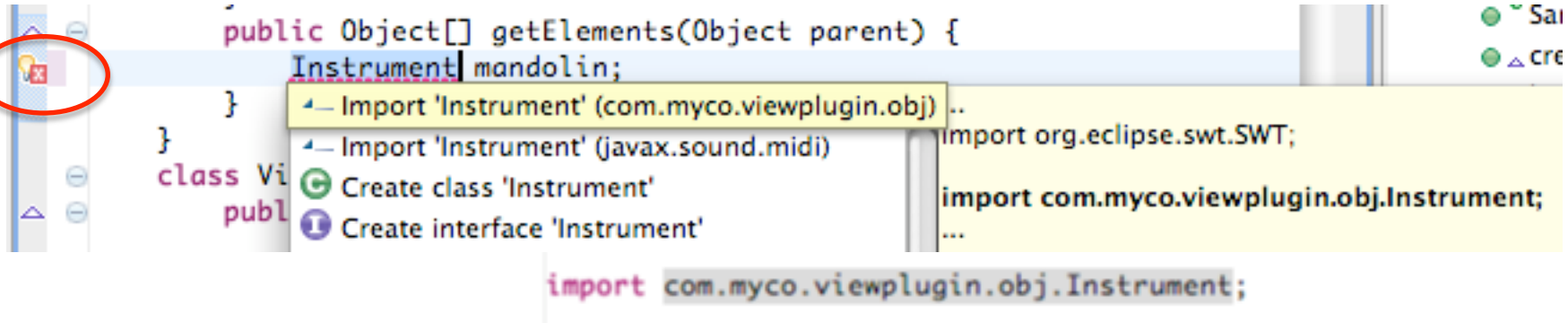
- Hover over error marker (red X) to see "Instrument cannot be resolved to a type"



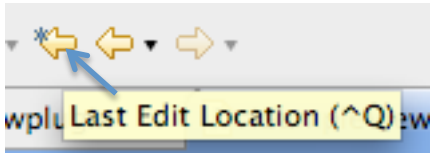
- The code needs a import statement to resolve it.
- See next slide on how to get Eclipse to fix it for you!

Use Quick Fix - to fix import

- Problem: “Instrument cannot be resolved to a type”
  - Solution: need to add an import statement for the new class in different package
- Single click on Light Bulb / Problem marker – or
  Use context menu (right mouse): Quick Fix – or –
  (Windows Ctrl-1) (Mac: Command-1) to see suggestions:



- Adds import to top of file:
- *Scroll up to see it then, to go back:*



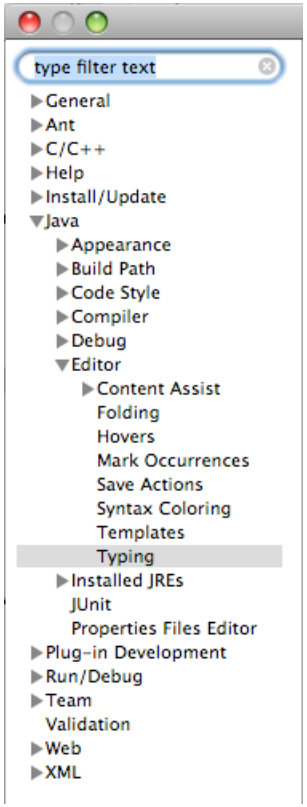
Complete getElements()

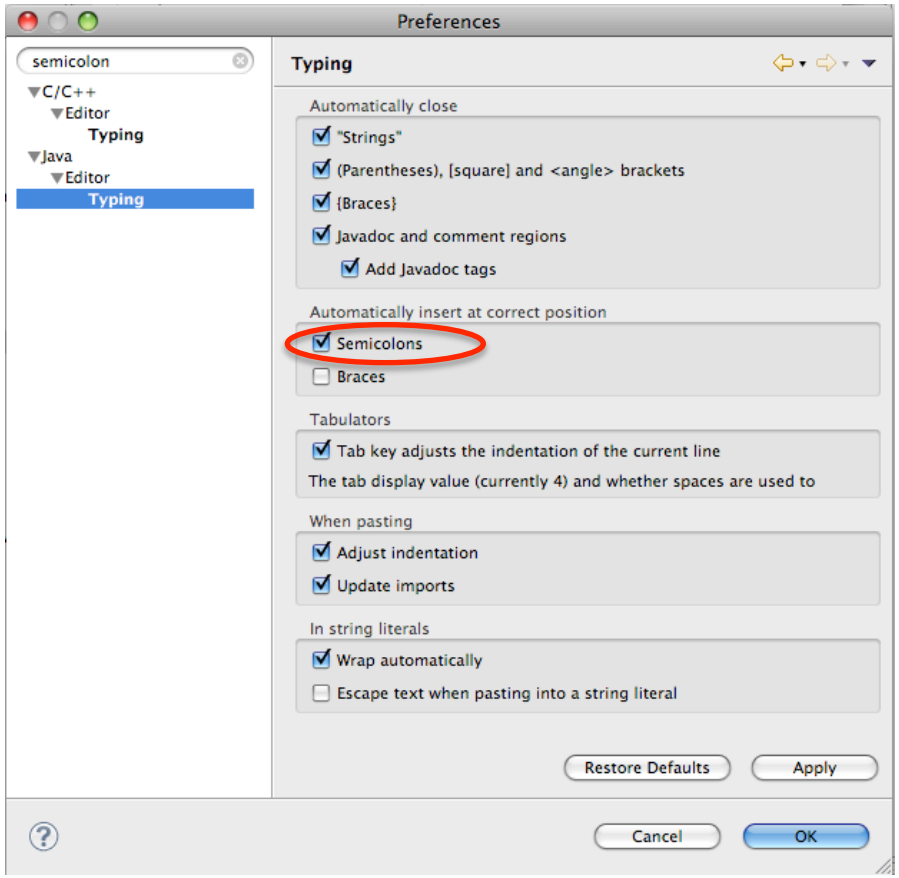
- Use completion/content assist, templates, etc to help with coding
- Change Preferences to automatically position semicolon (see next slide)

```
public Object[] getElements(Object parent) {
  Instrument mandolin = new Instrument("mandolin");
  Instrument fiddle = new Instrument("fiddle");
  Instrument banjo = new Instrument("banjo");
  return new Instrument[] { mandolin, fiddle, banjo };
}
```

Preferences

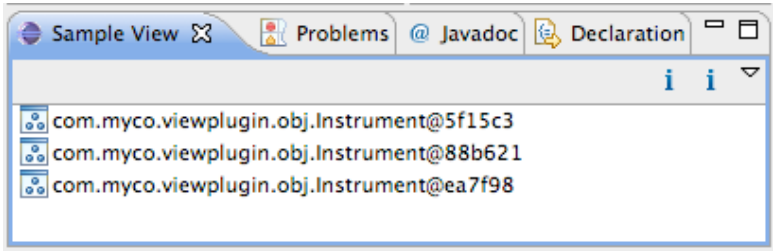
- Eclipse Preferences allow a *lot* of customization





Modify the Table View

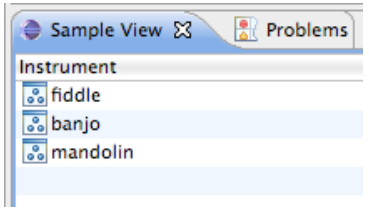
- Still in com.myco.viewplugin
- Launch again. Hmmm … not a very interesting view



- Modify the LabelProvider to provide the Instrument name

```
class ViewLabelProvider extends LabelProvider implements ITableLabelProvider {
    public String getColumnText(Object obj, int index) {
        return ((Instrument)obj).getName();
    }
```

- Relaunch; see nice names



- Now let's add columns to the table

Modify the Table View

Add columns to the table

- Add to top of createPartControl():

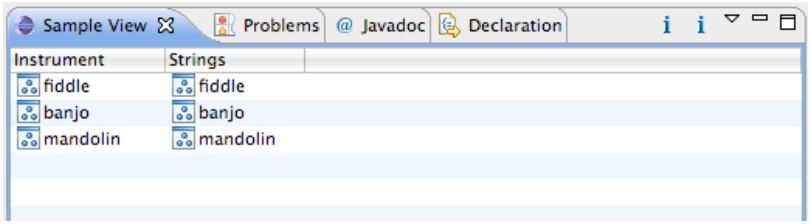
- Use QuickFix (click,F1) to fix imports: org.eclipse.swt.widgets
- Note you don't want the javax.swing classes that QuickFix will also suggest!

New code down to here

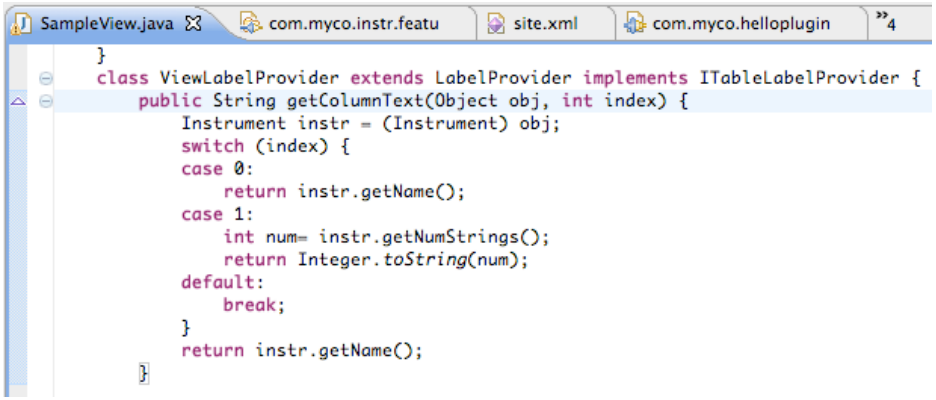
```
public void createPartControl(Composite parent) {
    Table table = new Table(parent, SWT.MULTI | SWT.H_SCROLL | SWT.V_SCROLL);
    TableLayout layout = new TableLayout();
    table.setLayout(layout);
    table.setLinesVisible(true);
    table.setHeaderVisible(true);

    TableColumn col1 = new TableColumn(table, SWT.None );
    col1.setText("Instrument");
    col1.setWidth(150);
    TableColumn col2=new TableColumn(table, SWT.NONE);
    col2.setText("Strings");
    col2.setWidth(90);

    //Table table = viewer.getTable();
    table.setHeaderVisible(true);
    table.setLinesVisible(true);

    //viewer = new TableViewer(parent, SWT.MULTI | SWT.H_SCROLL | SWT.V_SCROLL);
    viewer = new TableViewer(table);
    viewer.setContentProvider(new ViewContentProvider());
    viewer.setLabelProvider(new ViewLabelProvider());
    viewer.setSorter(new NameSorter());
    viewer.setInput(getViewSite());
```

Have columns, but…

- There are now two columns



- Fix getColumnText() to return label *by column*

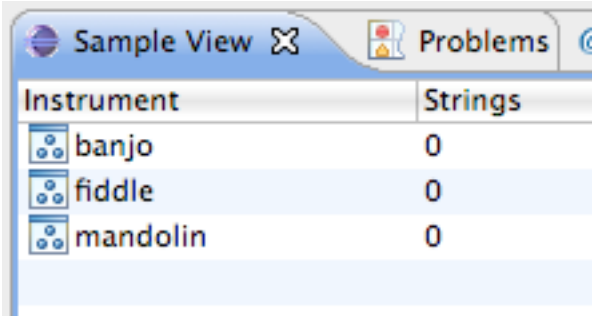


Make columns nicer

- Also change getColumnImage to only return image for first column

```
public Image getColumnImage(Object obj, int index) {
    if (index == 0) return getImage(obj);
    else return null;
}
```

- Launch again; we now have:



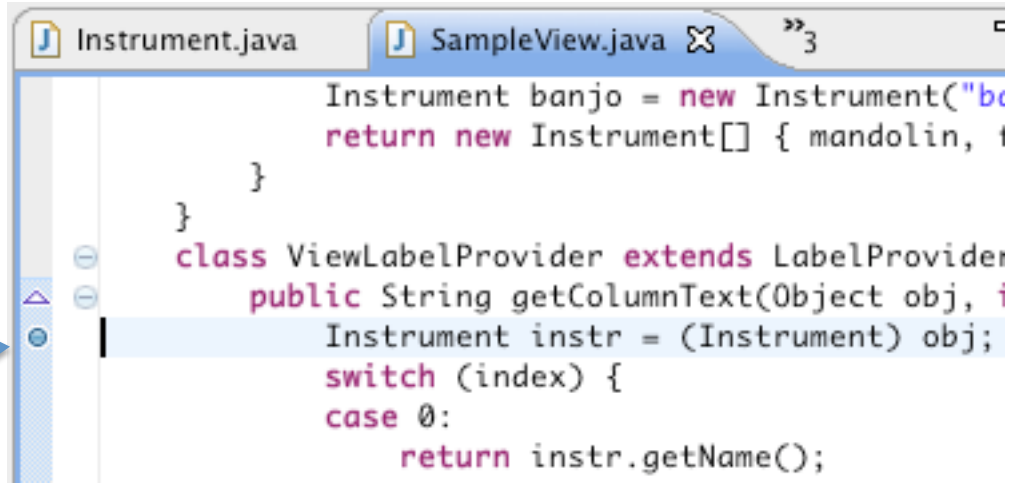
More if time permits

- Add number of strings to Instrument objects
- Add selection listener to col 1: open in debugger (Click on col heading to invoke/ get exception. What to catch? Surround with try/catch. ClassCatchException! Show code templates that automatically appear for the required interfaces.)
- Close runtime workbench; Edit manifest, change view name and category name; relaunch
- Optional Topic: hook up to model to receive changes

Debugging

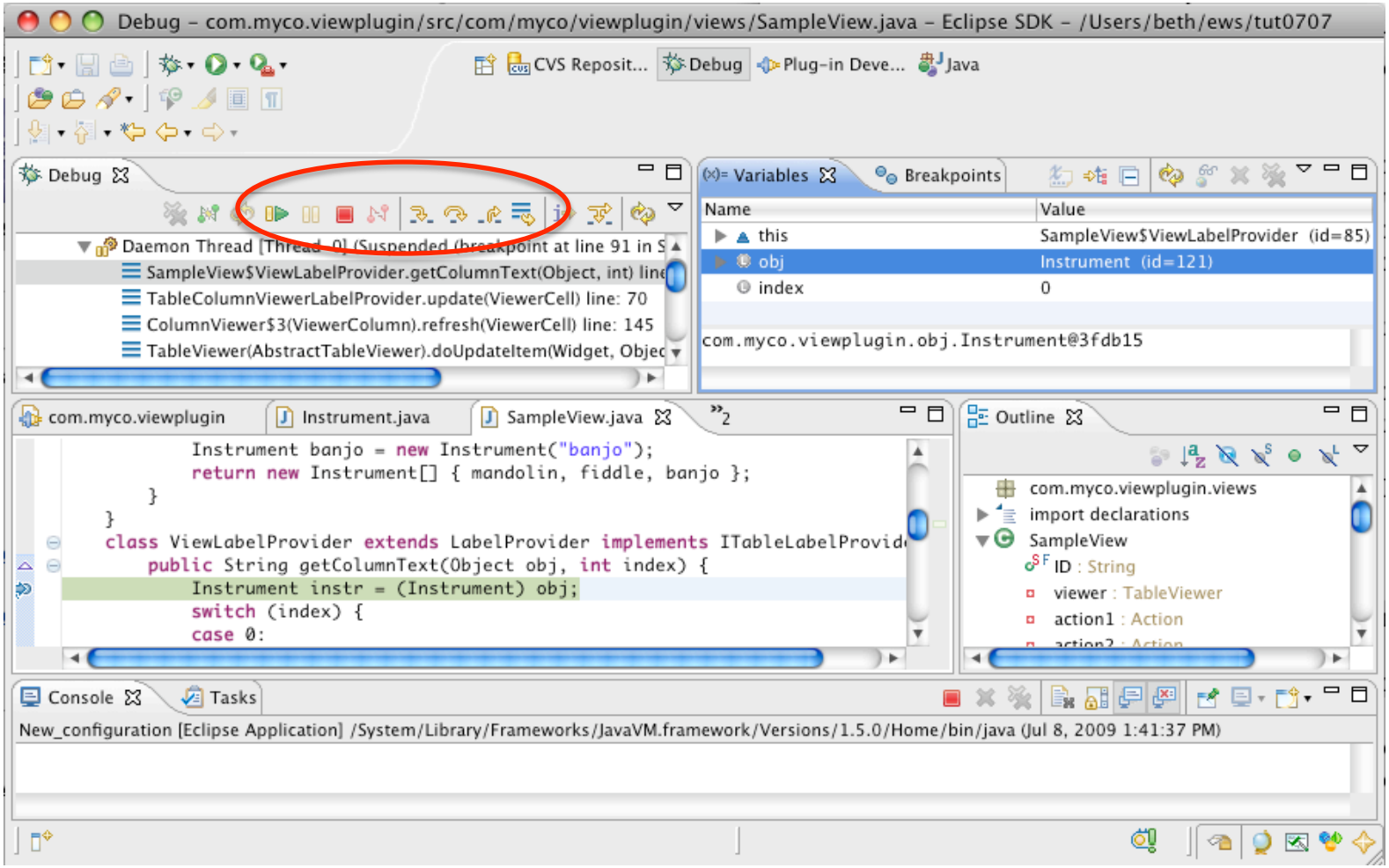
- Set breakpoint:

  Double-click
  at left edge



- Launch Eclipse debugger
- Run and step thru code

Eclipse debugger

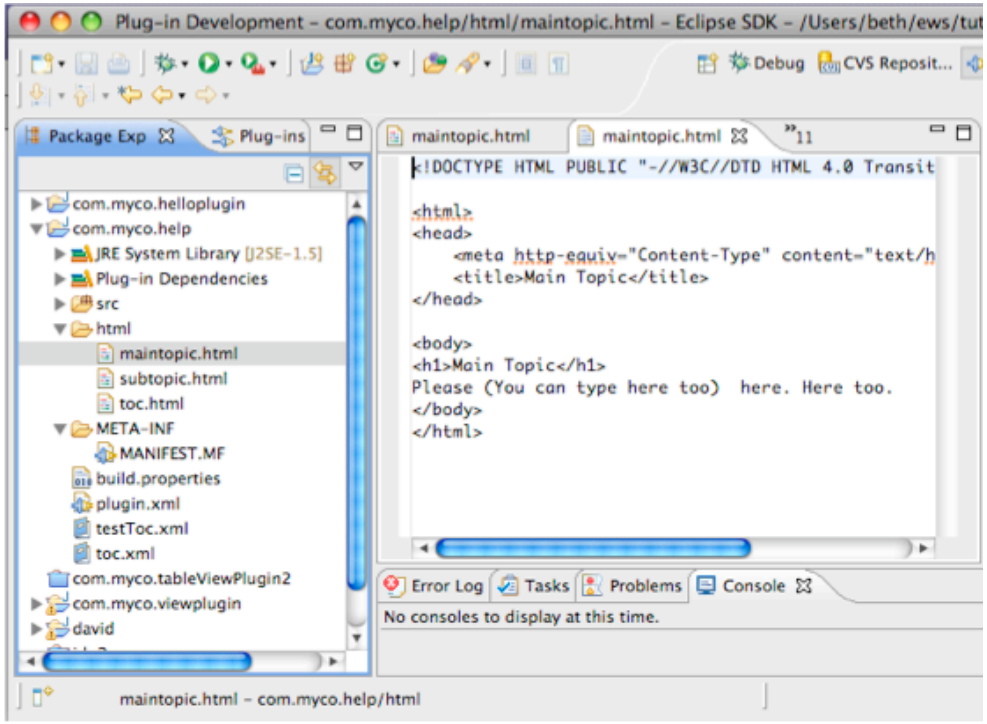


A Help Plug-in

- First, bring up Eclipse help to see what it does
  - Help > Help Contents
- For more info: See help, Platform Plug-in developer guide >programmer's guide > user assistance support > Help
- Let's make a help plug-in project, and use the wizard as an example

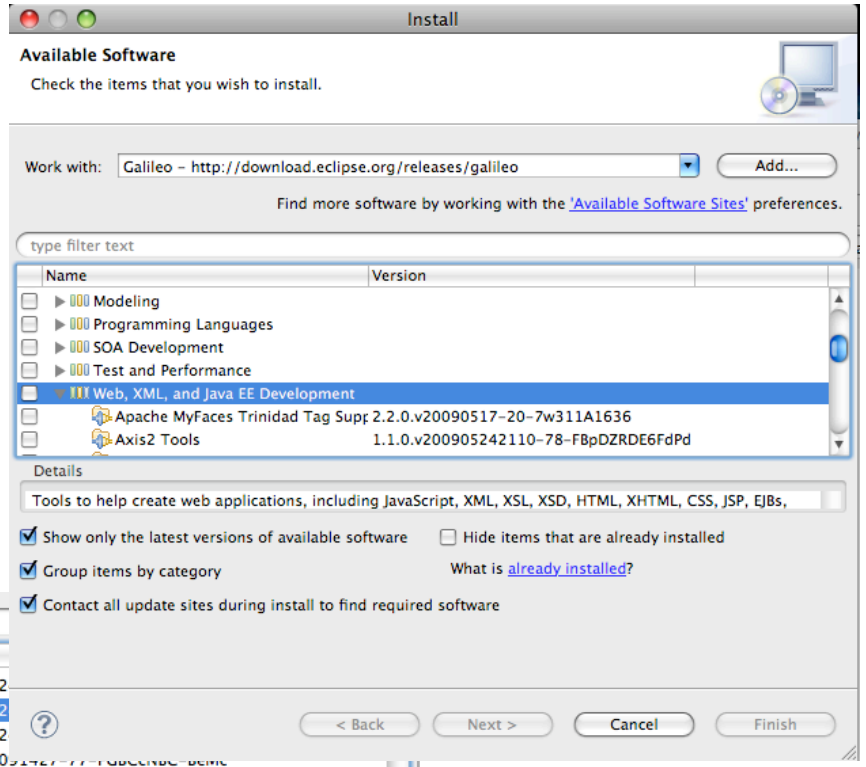
Help Plugin Project

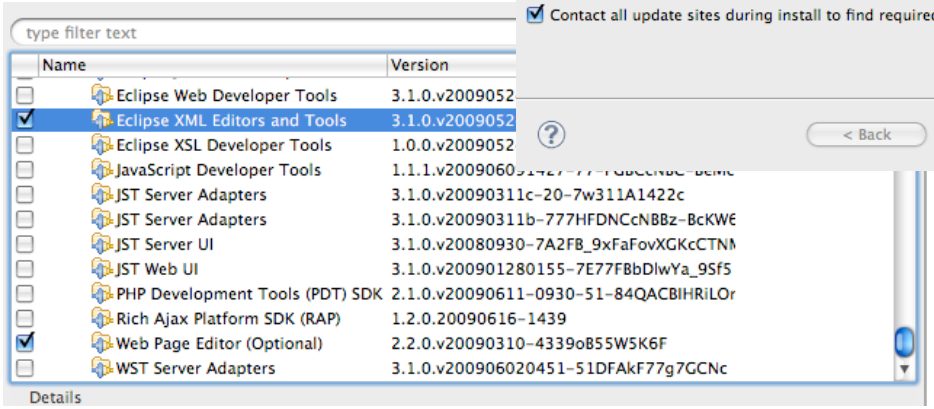
- New plugin project
- Name: com.myco.help,
  Next >, Next >
- Plug-in with sample help content;
  Finish
- Project is created; manifest opens
- Peruse project contents:
  html, xml, etc.



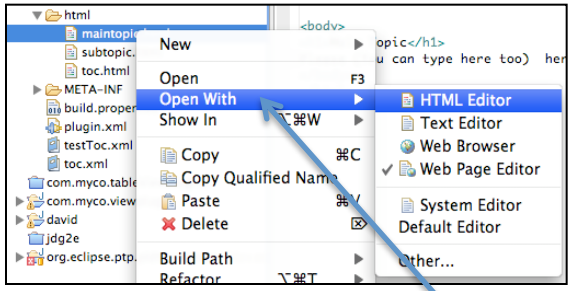
Install XML/HTML Editors

- We need html/xml editor: Install them!
  - Help >Install new software
  - Work with: Galileo site
  - Under Web, XML, and Java EE Dev…
  - Choose “Eclipse XML Editors and Tools” and
  - “Web Page Editor”
  - Next >, Next >
    Accept, Finish
    Restart

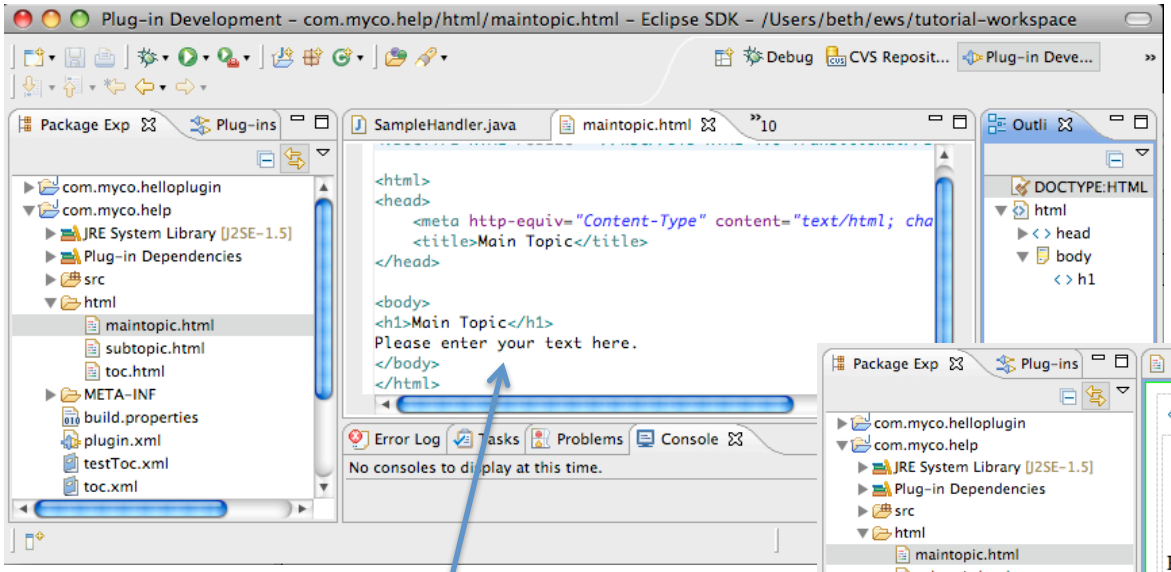




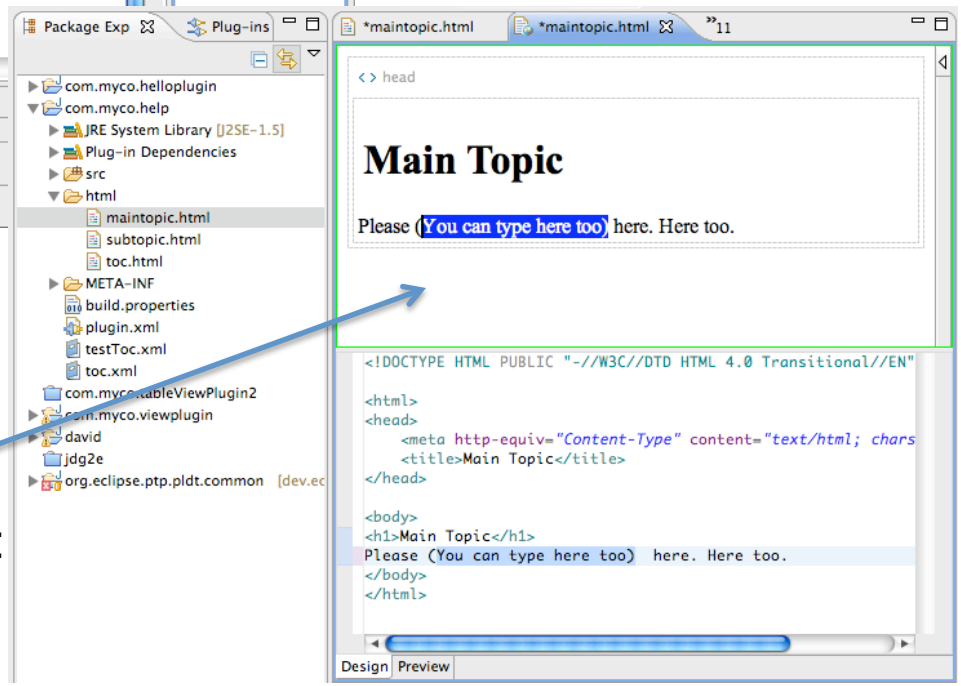
Editing HTML



Select file, rightMouse, Open With…



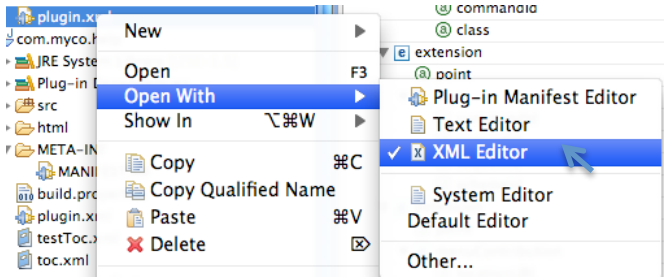
- HTML Editor:
  syntax highlighting, outline, completion, etc.



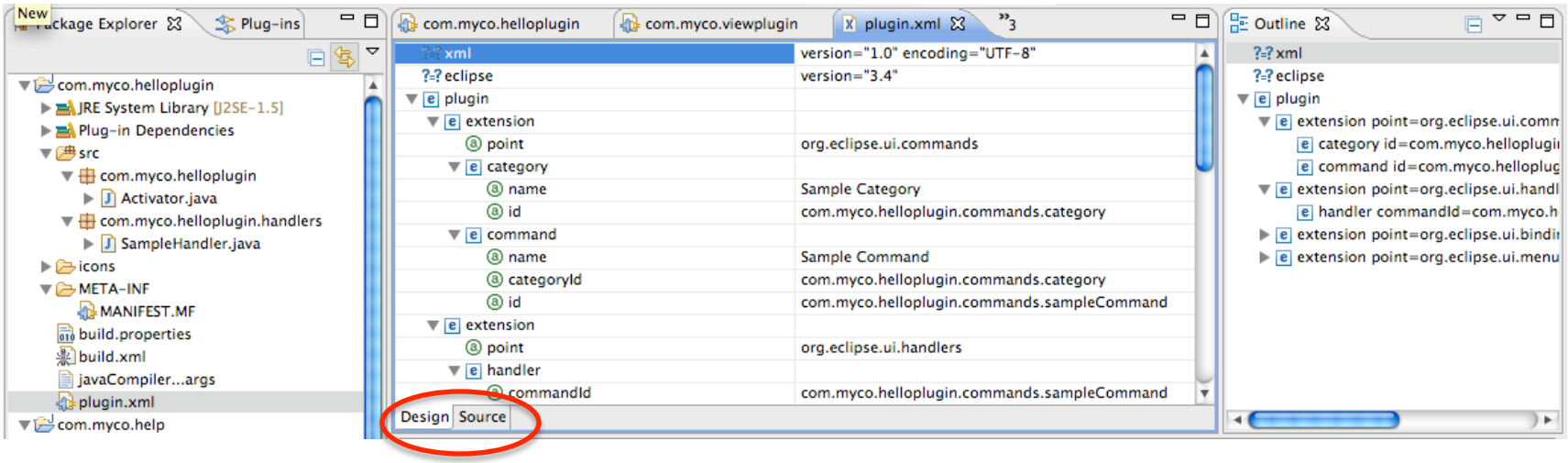
- Web page editor:
- 2-pane with wysiwyg

Editing XML

- Open With > XML Editor – Design and Source tabs

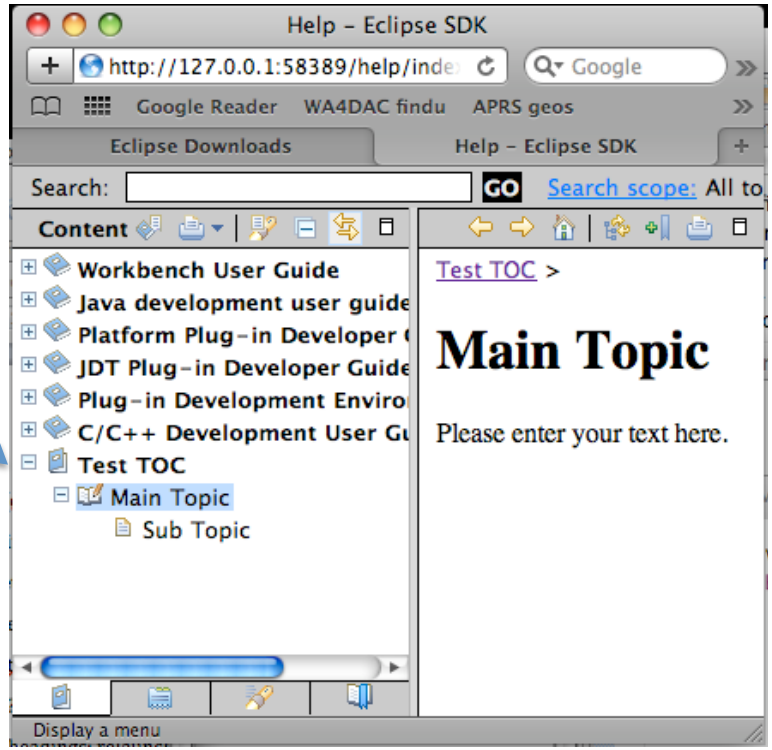


You don't really need the XML editor for editing Eclipse manifests, however. There are special editors for these.



Run the Help Plug-in

- Launch the runtime workbench -- as before
- Make sure the new plug-in is included in the plug-ins included in the launch configuration
  (it probably is)
- In runtime workbench:
  - Help > Help Contents
  - See your new content!



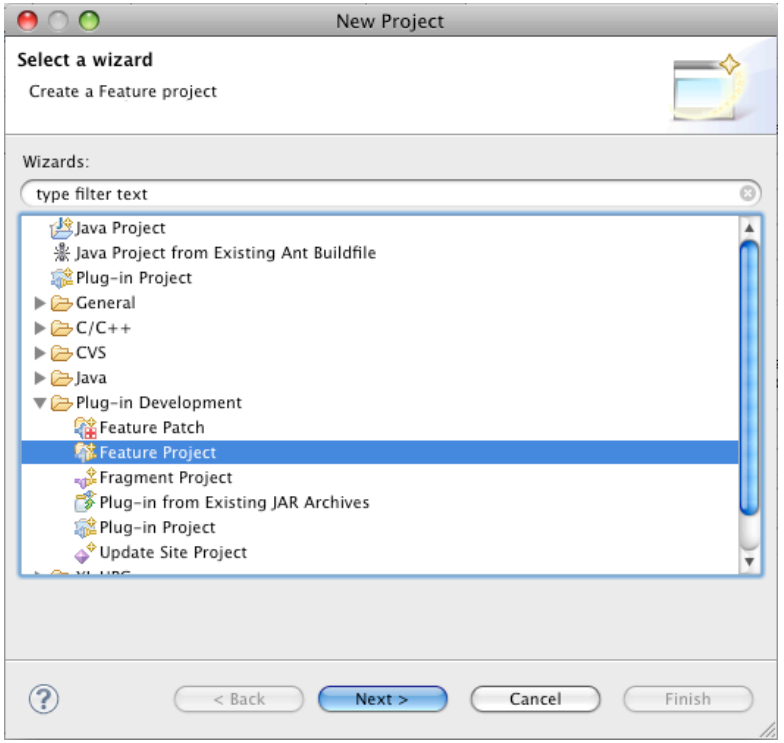
- Other components of Eclipse "Help"
  - Cheatsheets – walk user thru steps
  - "Welcome" page content
  - …etc

Packaging

- You want others to be able to install your plug-in(s)
- Steps:
  1. Create a feature to list the plug-ins
  2. Create an update site project with your feature(s)
  3. Build it, test the install, and distribute
     - Zip archive, or
     - On web site

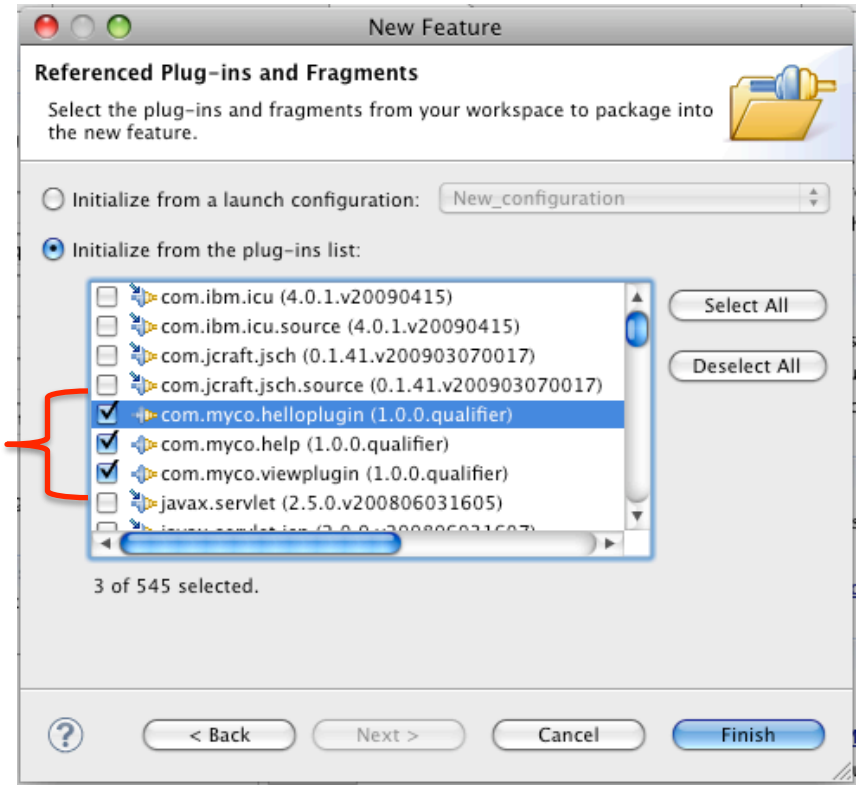
Create a feature project

- An Eclipse *feature* encapsulates one or more plug-ins. It's the unit which is *installed* by users.
- File > new Project,
  Plug-in Development >
  Feature Project
  Next >
- Project name: e.g.
  com.myco.thing.feature
  Next >



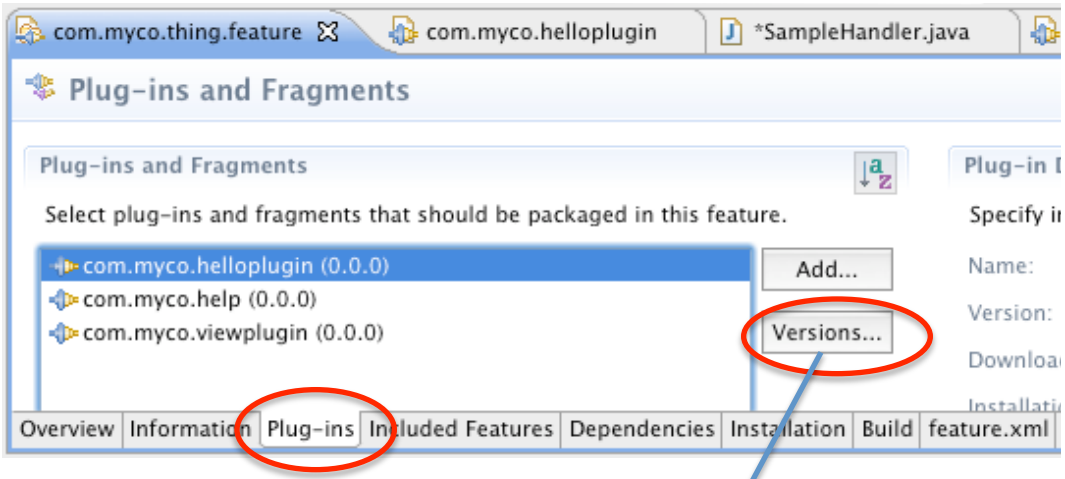
Add plugins to feature

- Add plug-ins
  Check all the plug-ins you made
- Finish

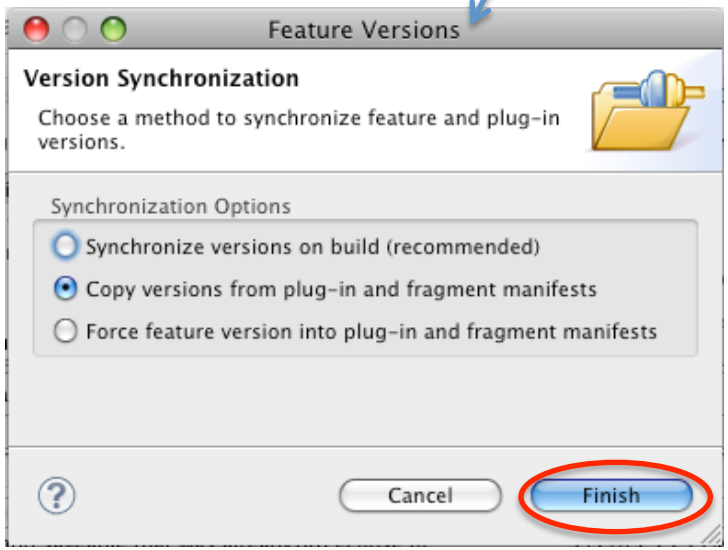


Feature versions

- You are editing the feature manifest, feature.xml

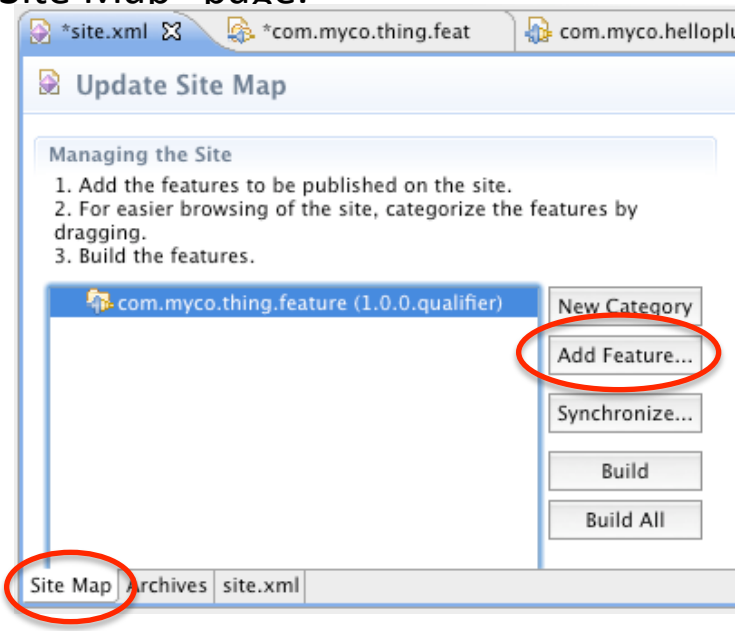


- On the Plug-ins tab:
- Versions…
  - Copy versions from plug-ins
  - Finish
- Save the feature.xml



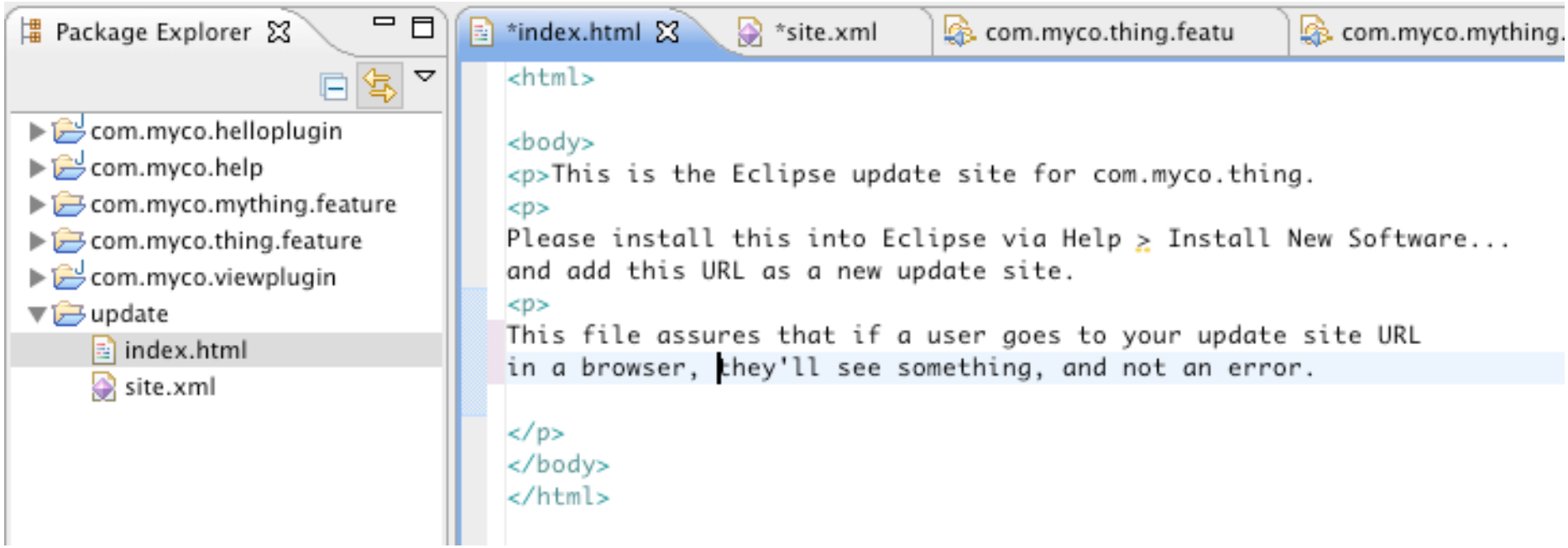
Update Site

- Create update site project
  New Project, Plug-in Dev, Update Site Project
  Name it e.g.: “update”
  - You’re editing the site.xml file
  - Add your new feature to the “Site Map” page.



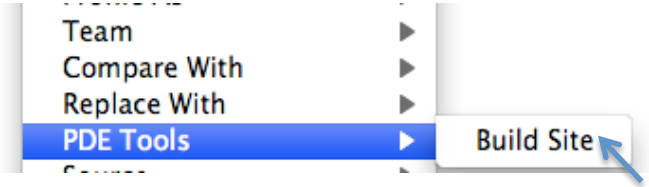
Add index.html

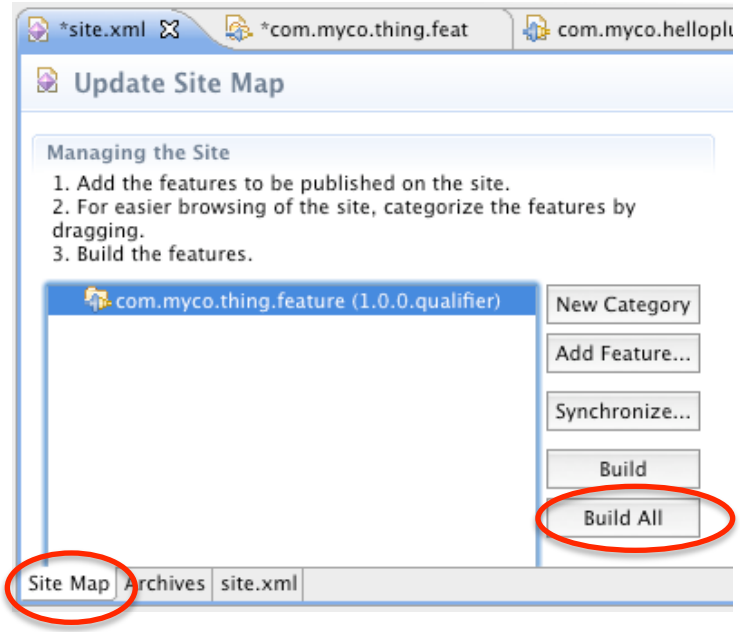
- *Hints and tips:*
- *Add an index.html file if you plan to host the update site on a server.*
- *Then if users go to your update site URL in a browser, they won't see an error.*
- *These directions tell them to use the URL within Eclipse, not a browser.*



Build the Update Site

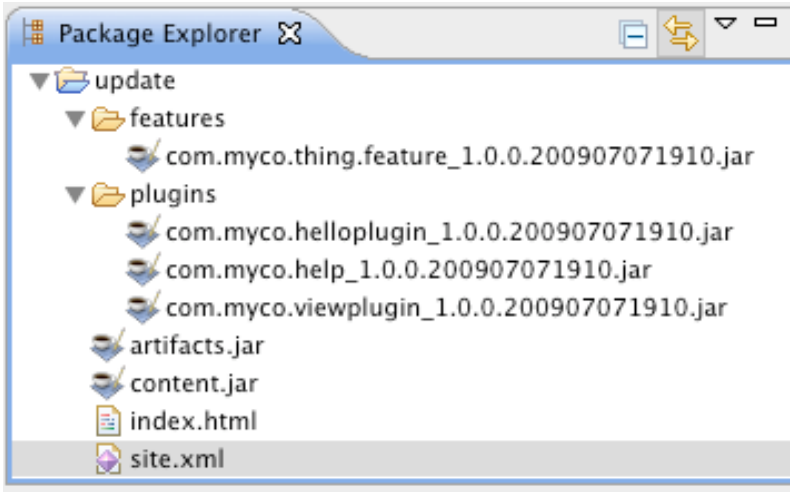
- Build the update site
  - Click “Build All”
  - Or: site.xml > rightMouse > PDE Tools > Build site





Update site: what got built

- This project contains the update site :
  - site.xml
  - index.html
  - features dir
  - plugins dir



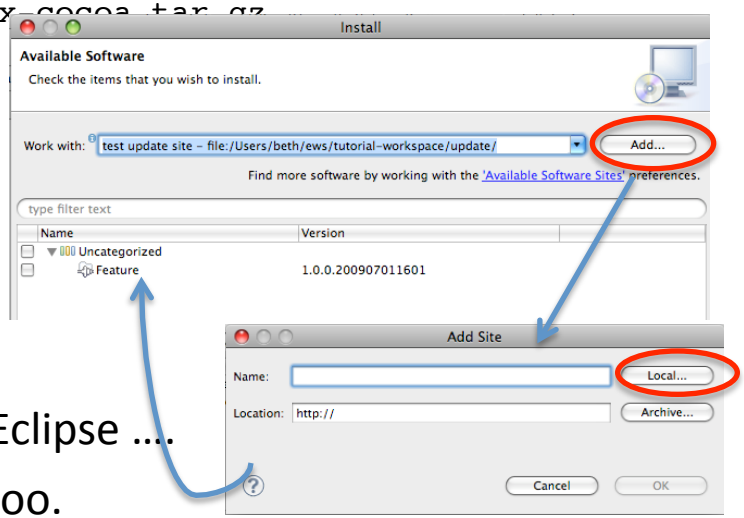
- Notes:
  - In versions, “qualifier” was replaced with timestamp
  - Move these to a web/file server and you have an update site!

Update site: Test install

- Extract a clean Eclipse SDK
  - Tar or unzip … launch … use new workspace name

```
$ mkdir test-install
$ cd test-install
$ tar -xzf ~/downloads/eclipse-SDK-3.5-macosx-cocoa.tar.gz
$ cd eclipse
$ ./eclipse
```

  - Help > Install New Software…
  - Add … Local any name will do
  - Point at your update site project location
  - Check your feature, finish install, restart Eclipse ….
  - Voila! New button in toolbar; new view too.



(Optional) Tweak feature/install

- Add a named Category
  - Update Site project: edit site.xml; on “Site Map” tab, click “New Category”, give it a name, drag your feature under it
  - Rebuild site site.xml > PDE Tools > Build Site
- Create new empty eclipse SDK (unzip again)
- Re-install: may not see the changes you made. Remove update site project & re-add, re-build.
  - Caching makes this awkward!!

(Optional) Handmade New Extension

Contributing to an Editor's toolbar – action to count words in editor selection

- In a new plugin project, or an existing one: Edit plugin.xml: Manifest editor, extensions tab
- Add: org.eclipse.ui.editorActions
- Target id: org.eclipse.ui.DefaultTextEditor (use browse …. To find it)
- new > action label: "MYCO: word count "
  - Icon: select the icons/sample.gif already in project
  - Tooltip: "MYCO: show word count of selected text"
  - enablesFor: "+" (one or more selected items; this is editor so an item is a character in the editor)
  - Toolbarpath: "additions"
  - Id: (optional) change to com.example.helloworld.wordcount (just for sanity)
  - Class: click underscored "class*:" to create with wizard
    - Name: WordCounter
    - Enter code…. (see next slide or provided sample files for run() and selectionchanged() methods
    - Manifest: Add dependency on org.eclipse.ui.editors to resolve "TextEditor"
      - Add dependency on org.eclipse.jface.text to resolve "ITextSelection"
    - Show Quick Fix, Organize Imports… to fix the imports
  - Test plugin! Launch runtime workbench.
    - Select text in editor, run new Action. Note *any* selection works. Remainder is Optional:
    - Change to only enable on editor text selection – close runtime workbench.
    - Extensions, rightmouse on "MYCO: word count (action)" New > selection and browse for "ITextSelection"
    - Inspect the plugin.xml that was generated. See how the XML changed.
    - Relaunch; note action button is greyed out if text isn't selected in the editor

(part of) WordCounter.java

Past this inside the class {}

```
private TextEditor textEditor;
static final String WORD_DELIMITERS = " .,/?<>;:[]{}\\|`~!@#$%^&*()-_+=\n\r";

public void setActiveEditor(IAction action, IEditorPart targetEditor) {
textEditor = (TextEditor) targetEditor;
}
public void run(IAction action) {
  IDocument document = textEditor.getDocumentProvider().getDocument(textEditor.getEditorInput());
  ITextSelection ts = (ITextSelection) textEditor.getSelectionProvider().getSelection();
  int tokenCount;
try {
  String text = document.get(ts.getOffset(), ts.getLength());
  tokenCount = new StringTokenizer(text, WORD_DELIMITERS).countTokens();
} catch (BadLocationException e) {
tokenCount = 0;
}
MessageDialog.openInformation(null, "JDG2E: Word Count", "Number of words: " + tokenCount);
}
public void selectionChanged(IAction action, ISelection selection) {
if (selection != null && selection instanceof ITextSelection) {
ITextSelection sel = (ITextSelection) selection;
if (sel.getLength() == 0) {
action.setEnabled(false);
} else {
action.setEnabled(true);
}
} else {
action.setEnabled(false);
}
}
```

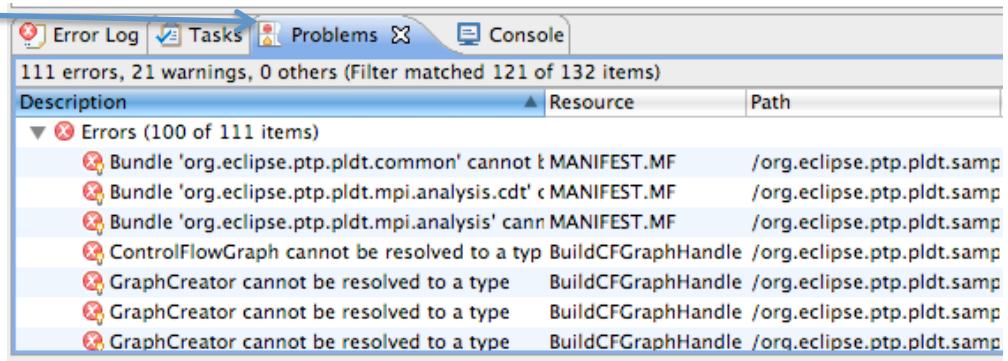
SA: Source Code Analysis

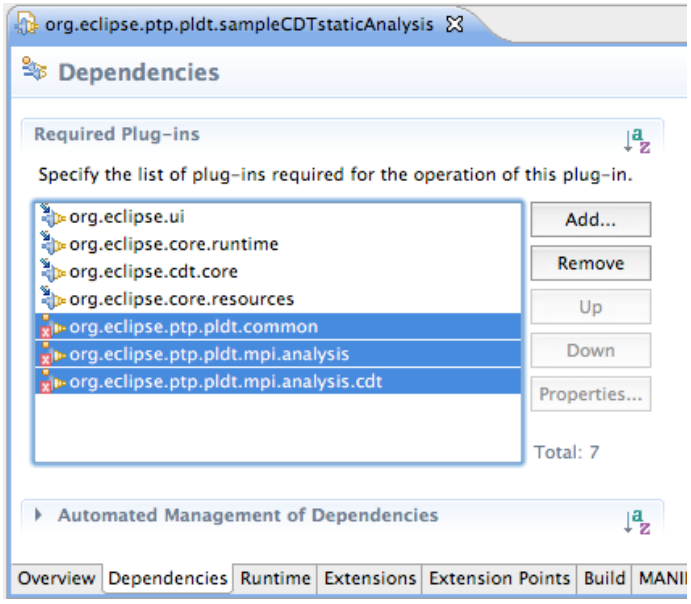
.. And some source code repository fun @ dev.eclipse.org
… And some plug-in dependency debugging

- We will do some source code analysis on C/C++ code
- First get CDT (Eclipse C/C++ Development Tools) : Help > Install new software, Galileo site
  - Galileo Site > Programming Languages, Eclipse C/C++ Development Tools – gets the basics
    Or: Add Site: http://download.eclipse.org/tools/cdt/releases/galileo - Lots more incl. alt. parsers, UPC
    - Note: you must have gcc/gdb/make etc. to actually *build/run* C code – but not required for this tutorial
  - Install and Restart eclipse
- Check out a plugin project from dev.eclipse.org repository:
  - Window > Open Perspective > Other … CVS Repository Exploring
  - In CVS Repositories view, rightMouse, New > Repository Location…
    - Host: dev.eclipse.org
    - Repository path: /cvsroot/tools
    - User: anonymous; hit Finish
  - Under the repo location, under HEAD, open org.eclipse.ptp, open tools folder, open samples folder
  - Check out org.eclipse.ptp.pldt.sampleCDTstaticAnalysis (rightMouse, Check Out)
  - Go back to PDE Perspective

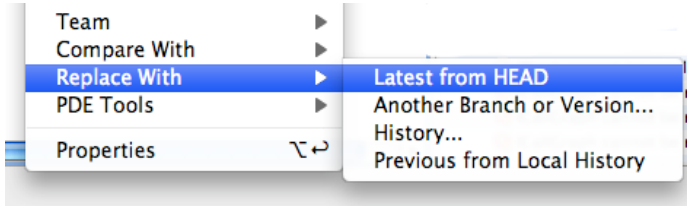
SA2: Source Code Analysis

- Look at project org.eclipse.ptp.pldt.sampleCDTstaticAnalysis you just checked out from eclipse.org
- Note red X's – open Problems View
- It seems we are missing some required plug-ins
- DETOUR: rest of this page is optional
- Try to see if we can do without them:
  - Edit META-INF/MANIFEST.MF
  - Dependencies tab, Remove:



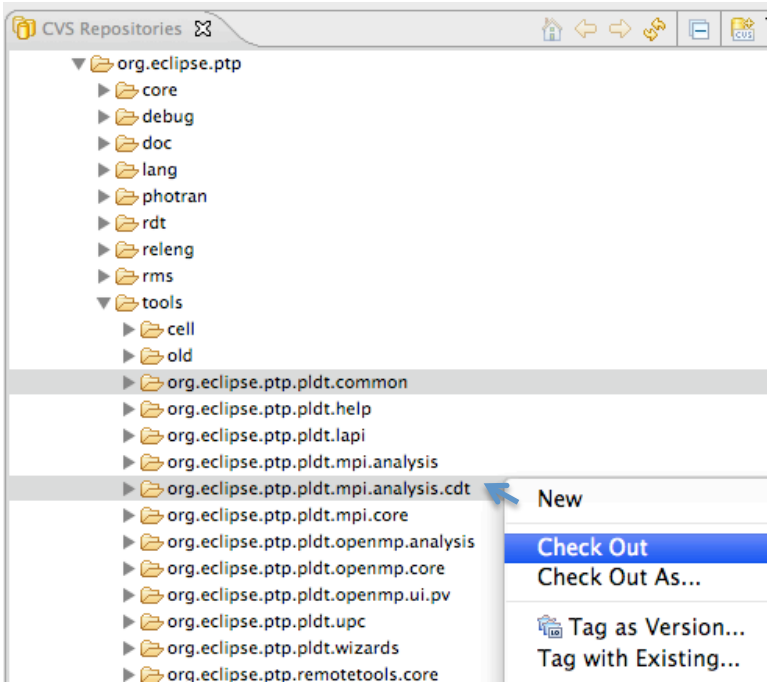


- Save manifest.
- Errors are still there. Darn.
- Get MANIFEST.MF back as we found it:
  - rightMouse, replace with,
    Latest from HEAD

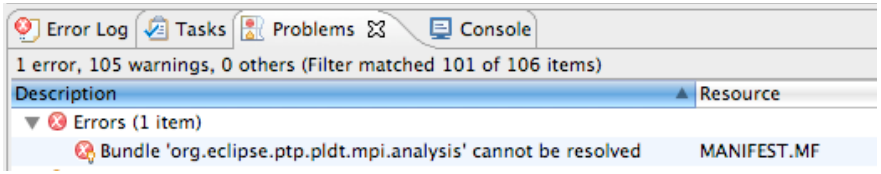


SA3: Source Code Analysis

- Let's check out the projects we need to correct the dependency errors.
- Back to CVS Repository Exploring Perspective
- Check out org.eclipse.ptp.pldt.common
  and org.eclipse.ptp.pldt.mpi.analysis.cdt



- Resolve errors: Force a rebuild:
  - Project > Clean…
    Clean projects selected below
    Check the sampleCDTstaticAnalysis project
- There is still one error:

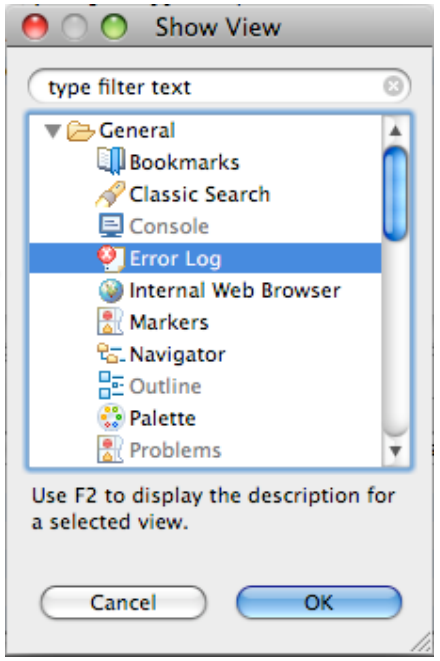


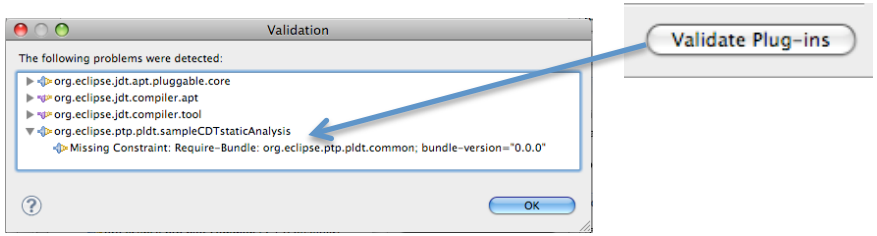
- But Note that there are no compile errors; let's assume this dependency isn't necessary
- Edit MANIFEST.MF; Dependencies tab; Remove mpi.analysis; save manifest
- Errors gone!

If you still get dependency errors, and you are sure you shouldn't, try (1) rebuilding project, or (2) removing and re-adding the dependencies

SA4: Source Code Analysis

- Launch runtime Eclipse workbench with new plugins
- Open C/C++ Perspective
  - Window >Open Perspective > Other… and select C/C++ Perspective
  - IF it's not there: Let's inspect
    - Close runtime workbench
    - Open Launch config, Plug-ins Tab, Target Platform
      - » Make sure all the CDT plugins are checked
      - » Easier: Check all at the top of Target Platform
      - » Relaunch: TA-DA! Open C/C++ Perspective
- We expect to see more toolbar buttons. Where are they?
  - Open the Error Log view: Window > Show View > Other
  - No news.
  - Close Runtime workbench. Open Launch Config.
  - On plugins tab, click "Validate Plug-ins" (lower right)



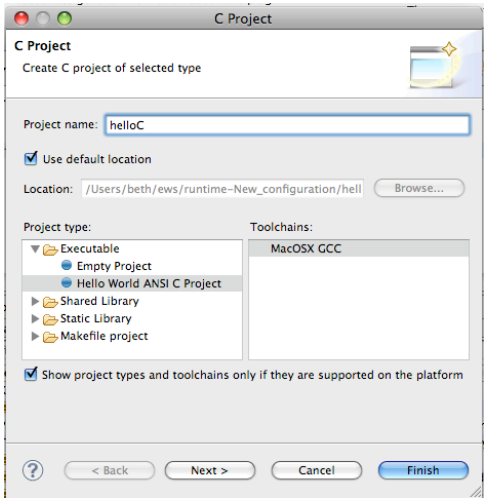


Missing plugin!! Is pldt.common checked in the plug-ins list under Workspace? If no, check it.

SA5: Source Code Analysis

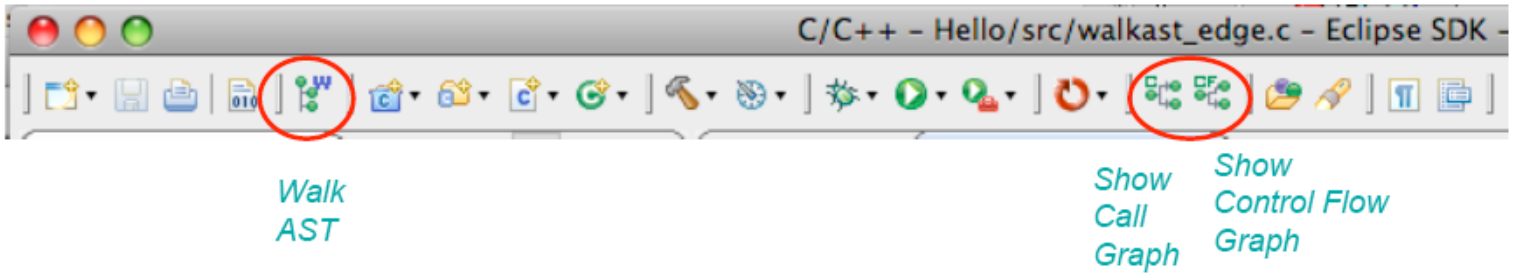
- Re-launch runtime Eclipse workbench with all the changes
- You should now see the icons for the analysis

- Now make a CDT Project
- New C Project – Hello World ANSI C Project



Get source samples from cdt analysis plugin, under 'samples' dir
•Copy and paste from one Eclipse workbench to another!
•See http://www.eclipsecon.org/2008/?page=sub/&id=373 - presentation "Static Analysis in PTP with CDT"

SA6: Source Code Analysis

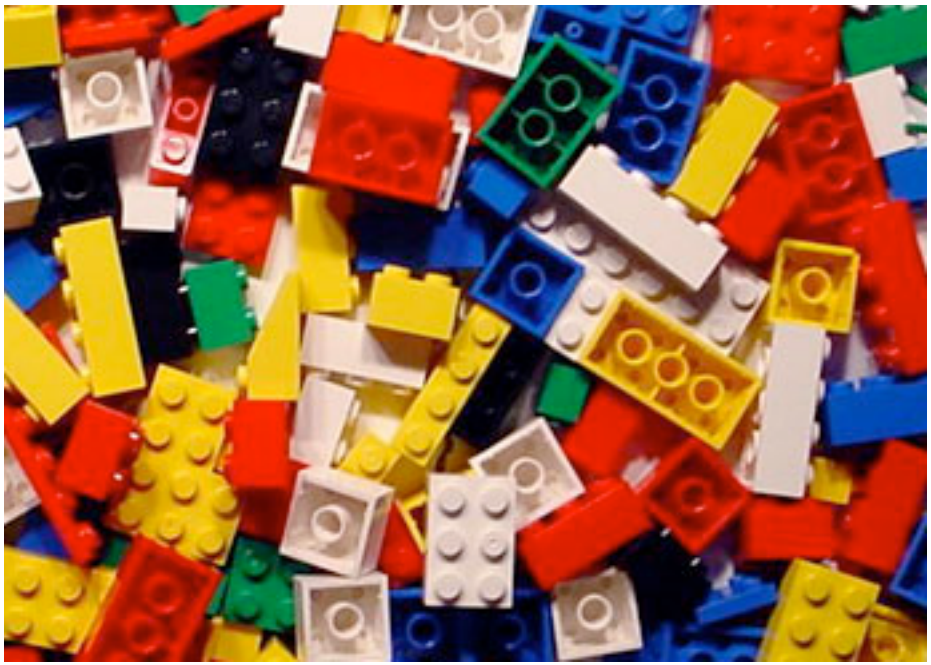


- Walkast.c

```
// p16
#include <stdio.h>
#define MYVAR 42

int main(void) {
    int a,b;
    a=0;
    b=MYVAR; // use defined
    b = b + a;
    return b;
}
int foo(int bar){
  int z = bar;
  return z;
}
```

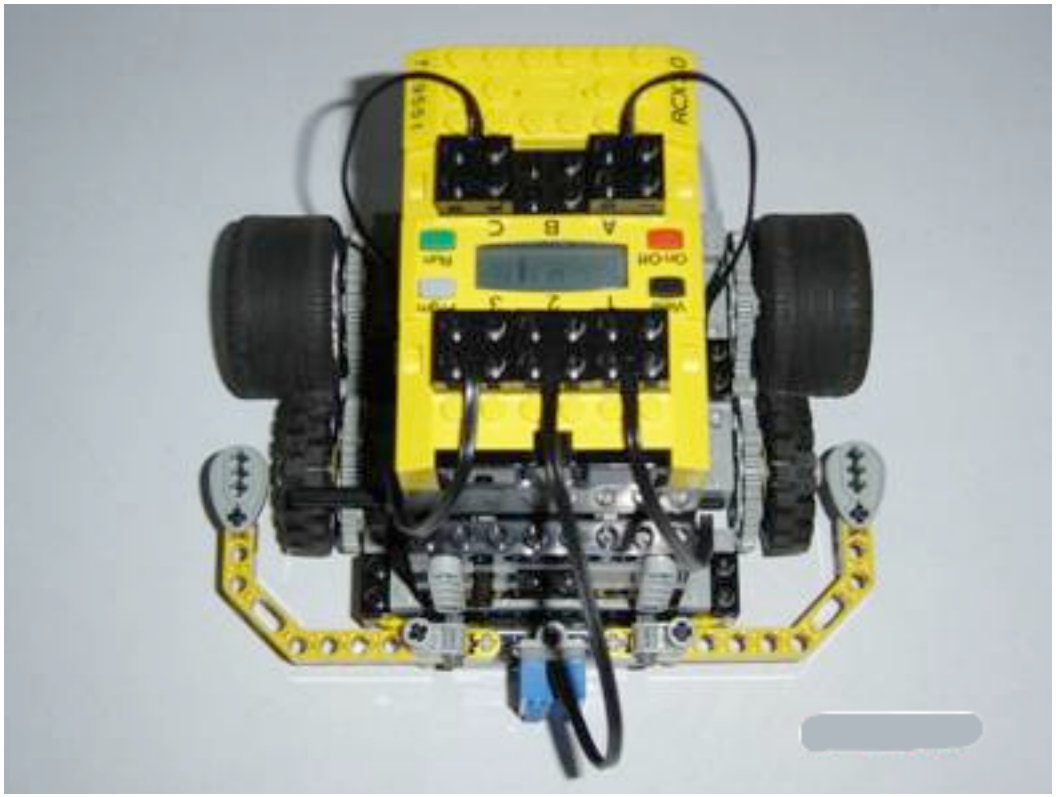
- Select Walkast.c file in Project Explorer
- Select "Walk AST" icon in editor toolbar
- See text output in (dev. Workbench) console
- Note: tree walk includes header files (it's long!)
- See src to this plug-in for examples of C/C++ manipulation

Summary



Summary

Summary



Summary

- Eclipse development has a steep learning curve
  - “swimming pool of Legos®”
  - It’s worth the investment!
  - Great set of tools, great community
- This tutorial is really just a “taste” of Eclipse development
- Take advantage of resources
  - Books, sites, help..
  - Newsgroups and mailing lists

References

- Google
- Eclipse Help – in your workbench and http://help.eclipse.org
- Articles on eclipse.org and IBM Developerworks
- Books
  - Eclipse plug-ins by Clayberg and Rubel (3rd ed.)
  - Java Developer's Guide to Eclipse (D'Anjou, McCarthy et.al.)