Distance Tool Tutorial

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User-friendly Desktop Internet GIS



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After completing this section, you will have gained the skills to:

- Create a new Plugin
- Define a new Extension
- Implement a new Tool Extension
- Update the user interface from within a tool.

2 CREATE A NEW PLUGIN

In this section you will create a new plug-in for the feature editor.

- 1. Open the Plug-in Development perspective.
- 2. From the **File** menu, select **New** \rightarrow **Project**.... Select Plug-in Project from the dialog, and then click the Next button.

🖨 New Project	
Select a wizard Create a Plug-in Project	
Wizards: Java Project Java Project from Existing Ant Buildfile Plug-in Project CV5 Eclipse Modeling Framework Eclipse Modeling Framework De Java Plug-in Development Eclipse Simple	
	٢
< Back Next > Finish	Cancel

Figure 1 - New Plug-in Project

3. Create a name for the plug-in by entering net.refractions.udig.tutorials.distancetool in the Project Name text field and click the Next button.

🗲 New Plug-in Project			
Plug-in Project			
Create a new plug-in projec	t		
Project name: net.refract	ions.udig.tutorials.distancetool		
Project contents			
☑ Use <u>d</u> efault			
Directory: C:\java\wudig	Inet.refractions.udig.tutorials.distancetool Browse		
Project Settings			
Create a Java project			
Source Folder Name:	src		
	join		
Plug-in Format			
What version of Eclipse is this plug-in targeted for? 3.1 _			
	< Back Next > Einish Cancel		

Figure 2 - Naming the New Plug-in

4. Accept the default values used to generate the plug-in and click the Finish button.

nter the data req	uired to generate the plug-in.		P
Plug-in Properties			
Plug-in <u>I</u> D:	net.refractions.udig.tutorials.distancetool		
Plug-in <u>V</u> ersion:	1.0.0		
Plug-in N <u>a</u> me:	Distancetool Plug-in		
Plug-in Provider:			
<u>C</u> lasspath:	[
Plug-in Class			
Generate the	Java class that controls the plug-in's life cy	de	
C <u>l</u> ass Name:	net.refractions.udig.tutorials.distancetool	.DistancetoolPlugin	
This plug	in will make contributions to the UI		
Rich Client Applic Would you like to	ation create a rich client application?	C <u>Y</u> es	• N <u>o</u>

Figure 3 - New Plug-in Details

At this point the feature editor plug-in is created. Configuring the plug-in is the focus of the next section.

In this section you will configure the feature editor plug-in. Specifically, you will specify dependencies on other plug-ins in order to create a new feature editor.

- 1. Open the Plug-in Development perspective.
- In the Package Explorer navigate to the plug-in created in the previous section. Open the plug-in manifest by navigating to the META-INF → MANIFEST.MF file under the root of the feature editor plug-in. Double click on the file to open the plug-in manifest editor.



Figure 4 - Plug-in Manifest Editor

3. Open the plug-in dependencies by clicking on the Dependencies tab located at the bottom of the editor area.



Figure 5 - Plug-in Dependencies

- 4. Click the Add... button in the Required plugins column and add the following plugins:
 - a. net.refractions.udig.libs
 - b. net.refractions.udig.project.ui
- 5. At this point it is critical that you save your work as the dependencies need to propagate into the project.

Penet.refractions.udig.feature.editor (0.9.0)	~
net.refractions.udig.help (0.8.0)	
net.refractions.udig.libs (0.9.0)	
net.refractions.udig.mapgraphic (0.9.0)	
net.refractions.udig.printing.model (0.8.0)	
net.refractions.udig.printing.model.edit (0.8.0)	
🗇 net.refractions.udig.printing.ui (0.8.0)	
net.refractions.udig.project (0.8.0)	
net.refractions.udig.project.edit (0.8.0)	
net.refractions.udig.project.tests (1.0.0)	
⊅net.refractions.udig.project.tests.ui (1.0.0)	
net.refractions.udig.project.ui (0.9.0)	
<u> </u>	1

Figure 6 - Add New Plugin Dependencies



4 IMPORT RESOURCES INTO PROJECT

- 1. Select the new project, net.refractions.udig.tutorials.distancetool, in the Package Explorer.
- 2. Select **File** \rightarrow **New** \rightarrow **Folder** from the Menubar.
- 3. Enter icons as the folder name.
- 4. Click the **Finish** button.
- 5. Select icons directory.
- 6. Select **File** \rightarrow **New** \rightarrow **Folder** from the Menubar.
- 7. Enter pointers as the folder name.
- 8. Click the **Finish** button.
- 9. Select icons directory.
- 10. Select **File** \rightarrow **New** \rightarrow **Folder** from the Menubar.
- 11.Enter etool16 as the folder name.
- 12. Click the **Finish** button.
- 13. Right click on etool16 and select Import.
- 14. Select File System.



Figure 7 - Import Selection Page

15.Enter tutorials\day1\DistanceTool\images in the From directory field.

16.Select the measure_mode.gif file and press Finish

🖨 Import	X		
File system Import resources from the local file system.			
From directory: L: \tutorials\day1\DistanceTool\images	B <u>r</u> owse		
····· ☑			
Filter Types Select All Deselect All			
Into folder: net.refractions.udig.distanceTool/icons/etool 16 Browse			
Options © Qverwrite existing resources without warning © Greate complete folder structure © Create selected folders only			
< <u>B</u> ack <u>N</u> ext > Finish	Cancel		

Figure 8 - Import Tool Icon

17.Import the measure_source.gif file into the pointers directory following steps 14 through 16.

5 DEFINE A NEW EXTENSION

- 18. Open the extensions page by clicking on the Extensions tab
- 19. Click the Add... button
- 20. Select the net.refractions.udig.project.ui.tool extension point from the list.
- 21. Click the Finish button.

Create a new extension from the net.refractions.udig.project.ui.tool extension point.	0—
Extension Points Extension Wizards	
Inet.refractions.udig.project.ui.editorInputs Inet.refractions.udig.project.ui.featureEditor Inet.refractions.udig.project.ui.itemProviderAdapterFactories Inet.refractions.udig.project.ui.tool org.eclipse.core.runtime.adapters org.eclipse.core.runtime.contentTypes org.eclipse.core.runtime.preferences	<
Available templates for net.refractions.udig.project.ui.tool:	
I ≤ 5now only extension points from the required plug-ins	

Figure 9 - Add Tool Extension

- 22. Enter net.refractions.udig.tutorial.distancetool in ID field of the extension form.
- 23. Enter Distance Tool Example in name field of the extension form.

🗧 Plug-in Development - net.refractions.udig.distanceTool - Eclipse SDK			
File Edit Navigate Search Project Run Window Help			
] [1] • [2] (2] [2] [2] [2] [2] [2] [2] [2] [2] [2] [₩ © •] 🥭 🔗 🗈 🖬 🗣 🏷		
net.refractions.udig.distanceTool ×	- 8		
Extensions			
All Extensions All Extensions Add Edit Edit	Extension Details Set the properties of the selected extension. ID: net.refractions.udig.tutorial.distancetool Name: Distance Tool Example Point: net.refractions.udig.project.ui.tool		
Down Down	Find declaring extension point Ppen extension point description		
Overview Dependencies Runtime Extensions Extension Points Build MANIFEST.MF plugin.xml huild.orgnerties			

Figure 10 - Enter Tool Extension Data

- 24. Right click on newly added extension and select $New \rightarrow modalTool$
- 25.Replace the default data in the id field with net.refractions.udig.tutorial.distancetool.
- 26.Enter a tool tip message into the **tooltip** field (eg "Measure the surface distance between two points").
- 27.Enter net.refractions.udig.tutorial.distancetool.DistanceTool into the class field.
- 28. Enter icons/etool16/measure_mode.gif into the icon field.
 - a. Or press the **Browse** button and locate the icon.
- 29. Enter Distance into the **name** field.
- 30. Set **onToolbar** to true.
- 31. Enter net.refractions.udig.tool.category.info into the **categoryId** field.

Plug-in Development - net.refractions.udig.distanceTool - Eclipse SDK			
Elle Edit Navigate Search Project Run Window He	p		
」ᄚᆞᇃᅀᆡᇔᅠᅠᅴᅓᆞᆞᅆᆞᆞᅆᆞᆥᅋᅊᆞᆝᄻᆕᄽᅟᄨᇔᅓᅆ 」ᅝᆞᄻᆞᆞᅌᆞ			
Net.refractions.u X MenuToolCategory Extensions All Distance (modalTool) 	Modalitem.java ToolProxy.java 22 C CommandHandler:		
> Body			
, Duda			
Overview Dependencies Runtime Extensions Extension P	onts Build MANIFEST.MF plugin.xml build.properties		

Figure 11 - Completed Modal Tool Definition

- 32. Right click on net.refractions.udig.tutorial.distancetool (modal Tool) and select New \rightarrow cursor.
- 33.Enter icons/pointers/measure_source.gif in the image field.
 - a. Or press the browse button and find the pointer icon.
- 34. Enter 10 in the hotSpotX field.
- 35.Enter 10 in the hotSpotY field.

🗣 Plug-in Development - net.refractions.udig.distanceTool - Eclipse SDK			
Elle Edit Navigate Search Project Run Window Help			
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🚯 net.refractions.udig.distanceTool 🗙 📄 Copy of plugin.xr	mi 🗁 Ə		
Extensions			
All	Extension Element Details		
😑 🔶 net.refractions.udig.project.ui.tool 🛛 🗛 dd	set the properties of cursor		
net.refractions.udig.tutorial.distance.tod	image: icons/pointers/measure_source.gif Browse		
-	hotspotX: 10		
Up	hotspotY: 10		
Down	id:		
4			
▶ Bodv			
Overview Dependencies Runtime Extensions Extension Points	Build MANIFEST.MF plugin.xml build.properties		
2			

Figure 12 - Tool Cursor Definition

The file tutorials\day\DistanceTool\sources\plugin.zip contains the plugin you are creating at this stage of development. You can compare the work you have done with the plugin provided if you are having problems.

6 IMPLEMENTING A MODALTOOL

- 1. Select net.refractions.udig.tutorial.distancetool (modalTool) in the Extensions editor.
 - a. It is a child of the net.refractions.udig.project.ui.tool.
- 2. Click the class hotlink.
- 3. Enter net.refractions.udig.project.ui.tool.AbstractModalTool in the superclass field or press the browse button and locate the class.
- 4. Check Generate comments.

🖨 Java Attribut	e Editor			
Java Class Create a new Java	dass.			
Source fol <u>d</u> er: Pac <u>k</u> age: 「Enclosing type:	net.refractions.udig.distanceTool/src	Browse Browse Browse		
Na <u>m</u> e: Modifiers: Superclass: Interfaces:	DistanceTool	Browsg Add Remove		
Image: static void main(String] args) Image: public static void main(String] args) Image: constructors from superclass Image: static void main(String] args) Image: constructors from superclass Image: static void main(String] args) Image: static void main(String) Image: static void main(String) Image: static void main(String) Image: static				
	Einish	Cancel		

Figure 13 - New Class Wizard

- 5. Press **Finish**, if not available ensure that all the information is correct.
- 6. Right click on editor and select **Source** \rightarrow **Override**/**Implement Methods**.
- 7. Expand AbstractTool node.
- 8. Check mousePressed(MapMouseEvent).
- 9. Check mouseReleased(MapMouseEvent).
- 10. Click the **OK** button.

Override/Implement Methods	
Select methods to override or implement:	Select <u>A</u> ll
 getContext() mouseDragged(MapMouseEvent) mouseDragged(MapMouseEvent) mouseEntered(MapMouseEvent) mouseExited(MapMouseEvent) mouseWaved(MapMouseEvent) mousePressed(MapMouseEvent) mouseReleased(MapMouseEvent) mouseWheelMoved(MapMouseEvent) Object 	Deselect All
Insertion point:	
Cursor position	•
Generate method comments	
The format of the method stubs may be configured on the <u>Code Templates</u> preference page.	
i 2 of 17 selected.	
ОК	Cancel

Figure 14 - Override Methods Dialog

11.Add a constructor that will register the tool for mouse events:



12.Implement the mousePressed(MapMouseEvent) method.

```
Coordinate start;
public void mousePressed(MapMouseEvent e) {
   start=getContext().pixelToWorld(e.x, e.y);
```

13.Implement the mouseReleased(MapMouseEvent) method.



14. Implement the displayError () method.



15.Implement the displayOnStatusBar(double) method.

```
private void displayOnStatusBar(double distance) {
   final IStatusLineManager statusBar = getContext().getStatusBar();
    if( statusBar==null )
          return; // shouldn't happen if the tool is being used.
    int totalmeters=(int)distance;
    final int km=totalmeters/1000;
    final int meters=totalmeters-(km*1000);
    float cm = (float) (distance-totalmeters)*10000;
    cm = Math.round(cm);
    final float finalcm=cm/100;
    getContext().updateUI(new Runnable() {
                 public void run() {
                 statusBar.setMessage("Distance = "+km+", "+meters+"m
"+finalcm+"cm");
         }
    });
```

The completed plugin code is in the tutorials\day\DistanceTool\sources\completeplugin.zip archive file.

7 TESTING THE PLUGIN

- 1. At this point you may have red x's on the project. Press Ctrl+Shift+0 to import any needed classes and save the file (this should refresh the project and clear up any error markers left behind).
- 2. From the **Project** menu select **Run** and choose the configuration you set-up in the previous chapter (see Section 5 <u>Compiling the uDig Plug-ins</u>).
- 3. When uDig launches make a new map (File->New Map) and your Distance tool should now be in the tool bar ready for use. Import a map into the Catalog (you can drag the DM Solutions WMS map from <u>http://udig.refractions.net/confluence/display/UDIG/Walkthrough+1</u> into the Layers View).
- 4. Make select the Distance Tool and drag from one point to another in the Map View and the distance should display in the bottom left corner.



Figure 15 - Distance Tool