# Distance Tool Tutorial

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*User-friendly Desktop Internet GIS*

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# 1 GOALS

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** → **Project**.... Select Plug-in Project from the dialog, and then click the Next button.

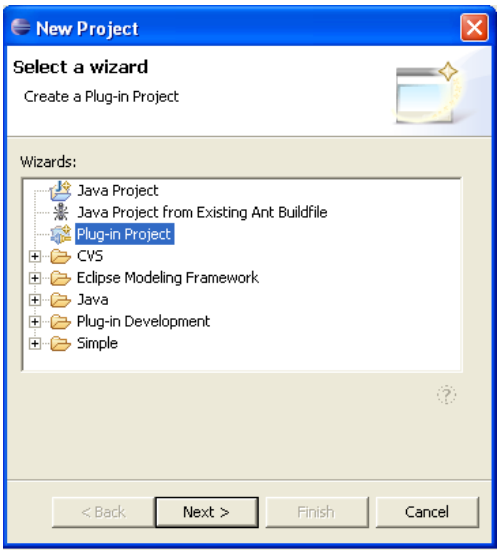


Figure 1 - New Plug-in Project

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.

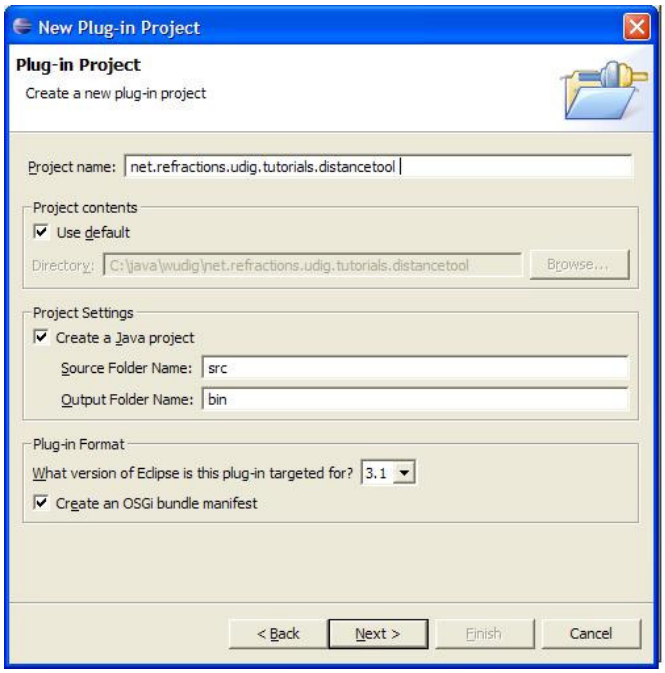


Figure 2 - Naming the New Plug-in

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

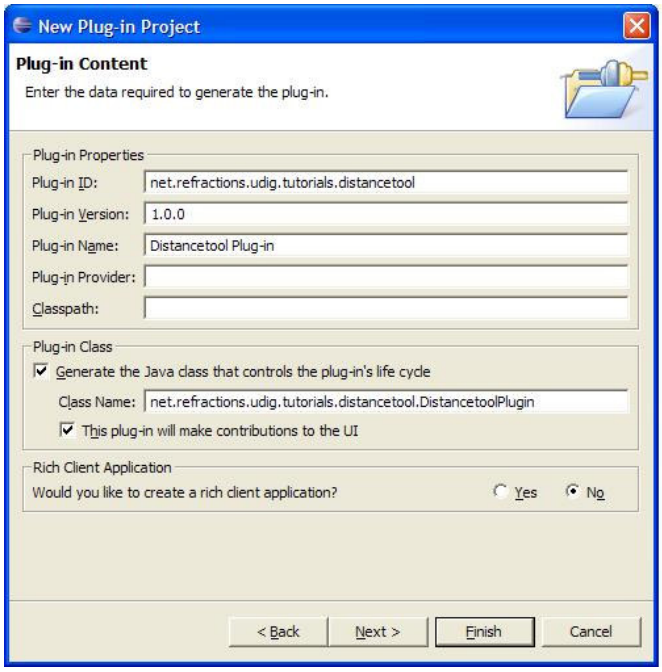


Figure 3 - New Plug-in Details

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

# 3 CONFIGURING THE NEW PLUG-IN

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.
2. 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.

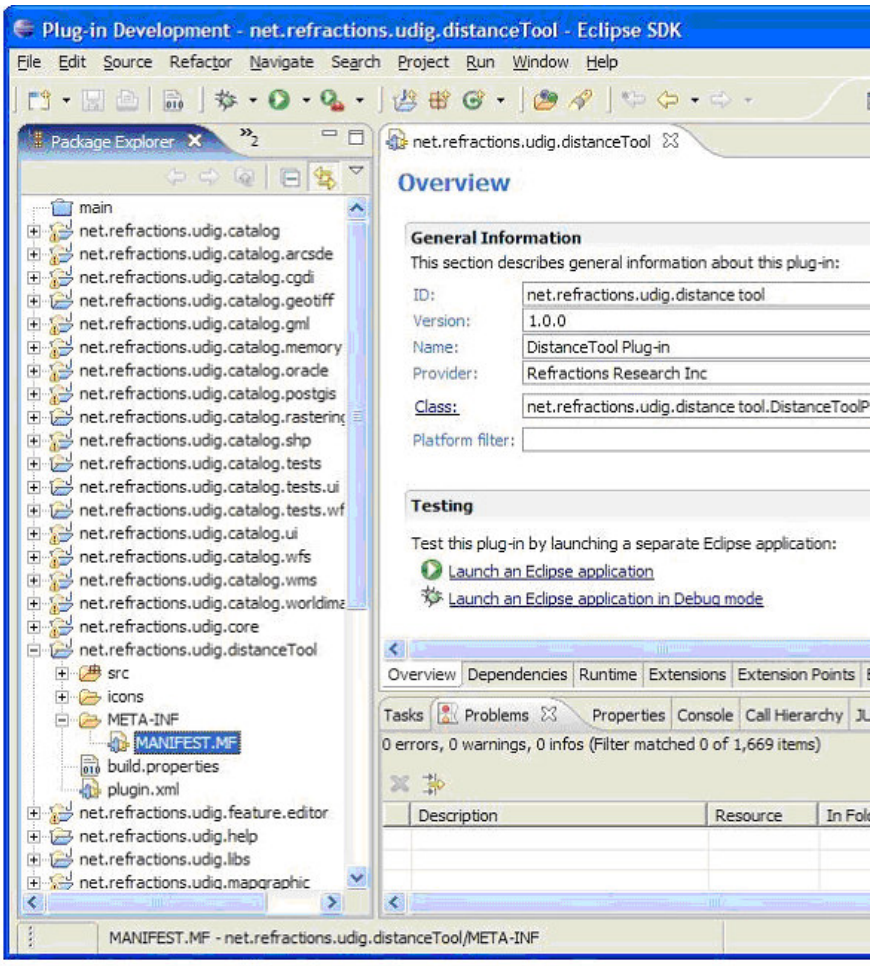


Figure 4 - Plug-in Manifest Editor

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

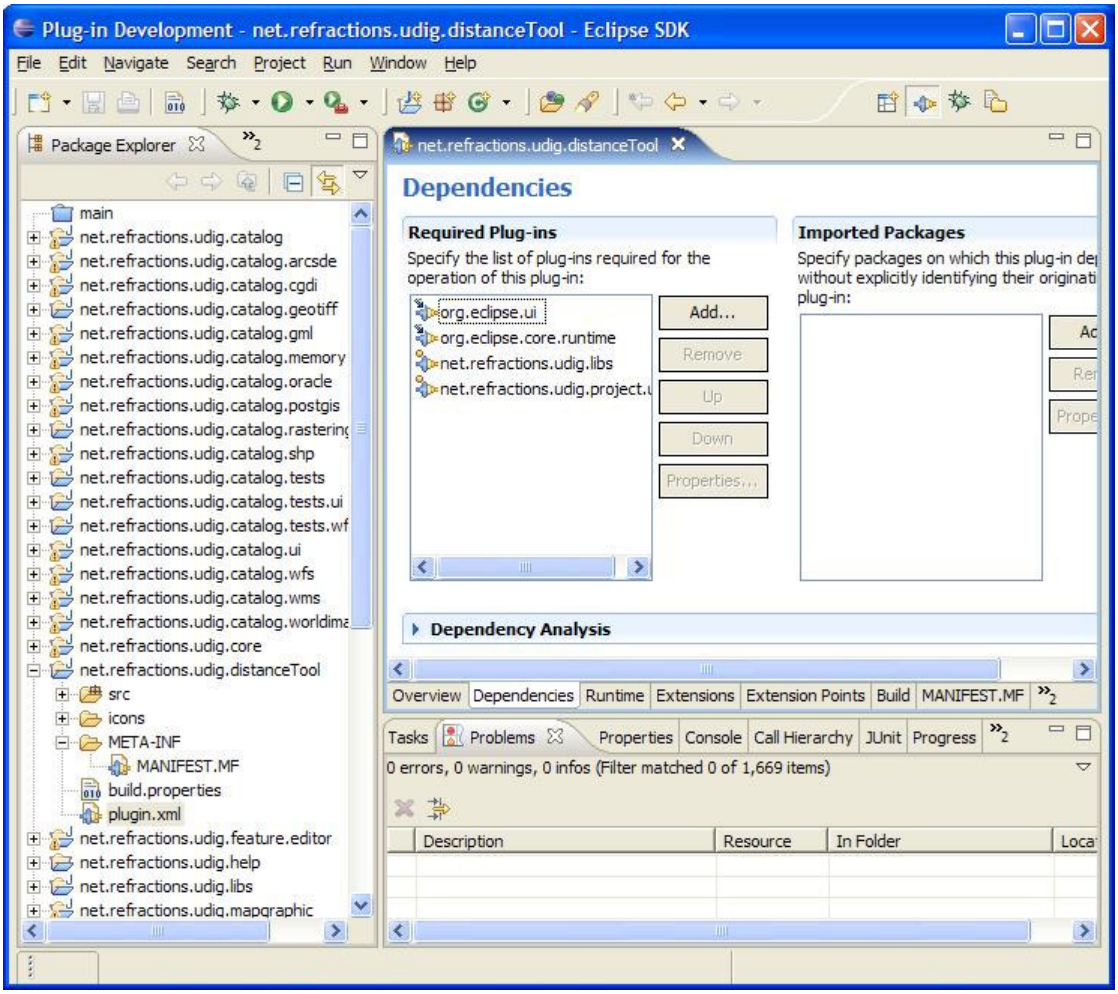


Figure 5 - Plug-in Dependencies

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.

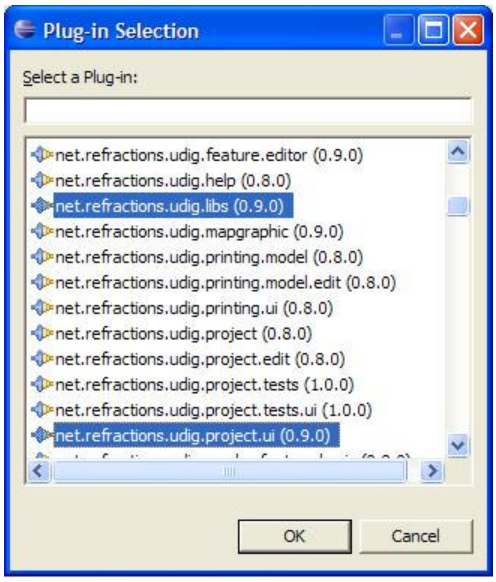


Figure 6 - Add New Plugin Dependencies

# 4 IMPORT RESOURCES INTO PROJECT

1. Select the new project, net.refractions.udig.tutorials.distancetool, in the Package Explorer.
2. Select **File** → **New** → **Folder** from the Menubar.
3. Enter icons as the folder name.
4. Click the **Finish** button.
5. Select icons directory.
6. Select **File** → **New** → **Folder** from the Menubar.
7. Enter pointers as the folder name.
8. Click the **Finish** button.
9. Select icons directory.
10. Select **File** → **New** → **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.

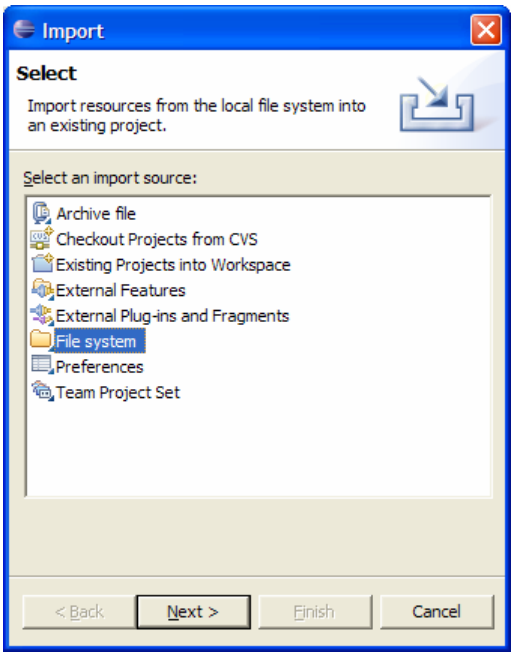


Figure 7 - Import Selection Page

15. Enter tutorials\day1\DistanceTool\images in the From directory field.
16. Select the measure_mode.gif file and press Finish

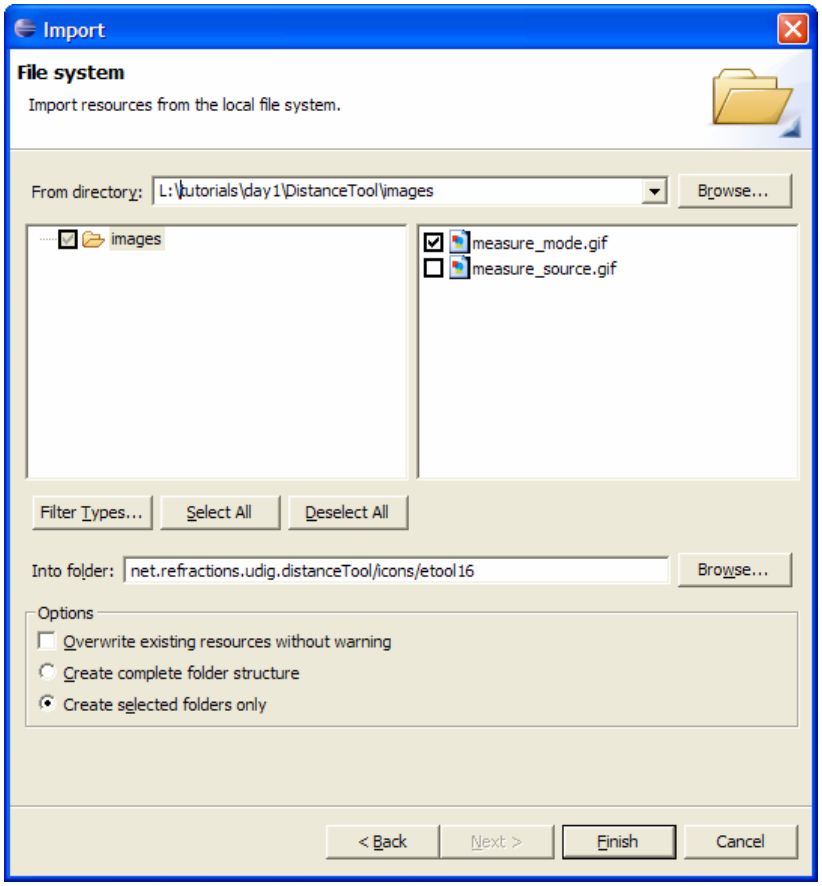


Figure 8 - Import Tool Icon

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

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.

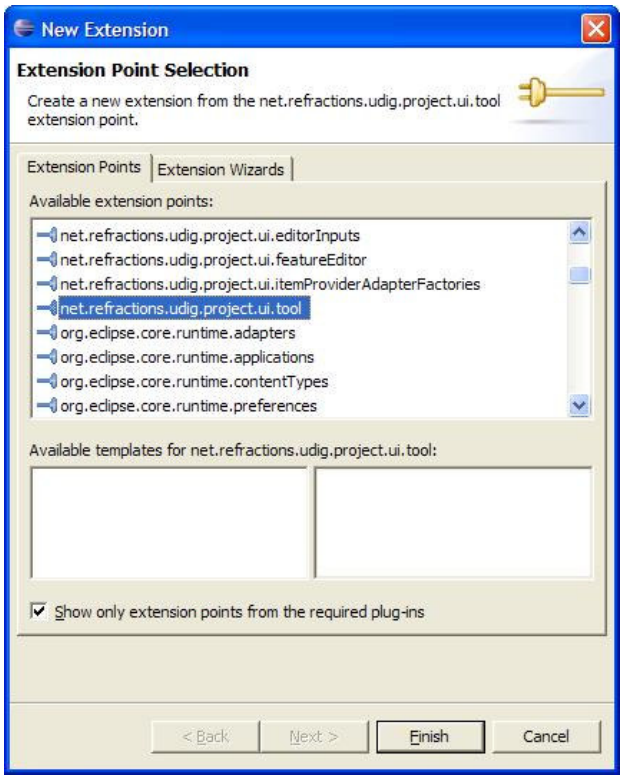


Figure 9 - Add Tool Extension

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.

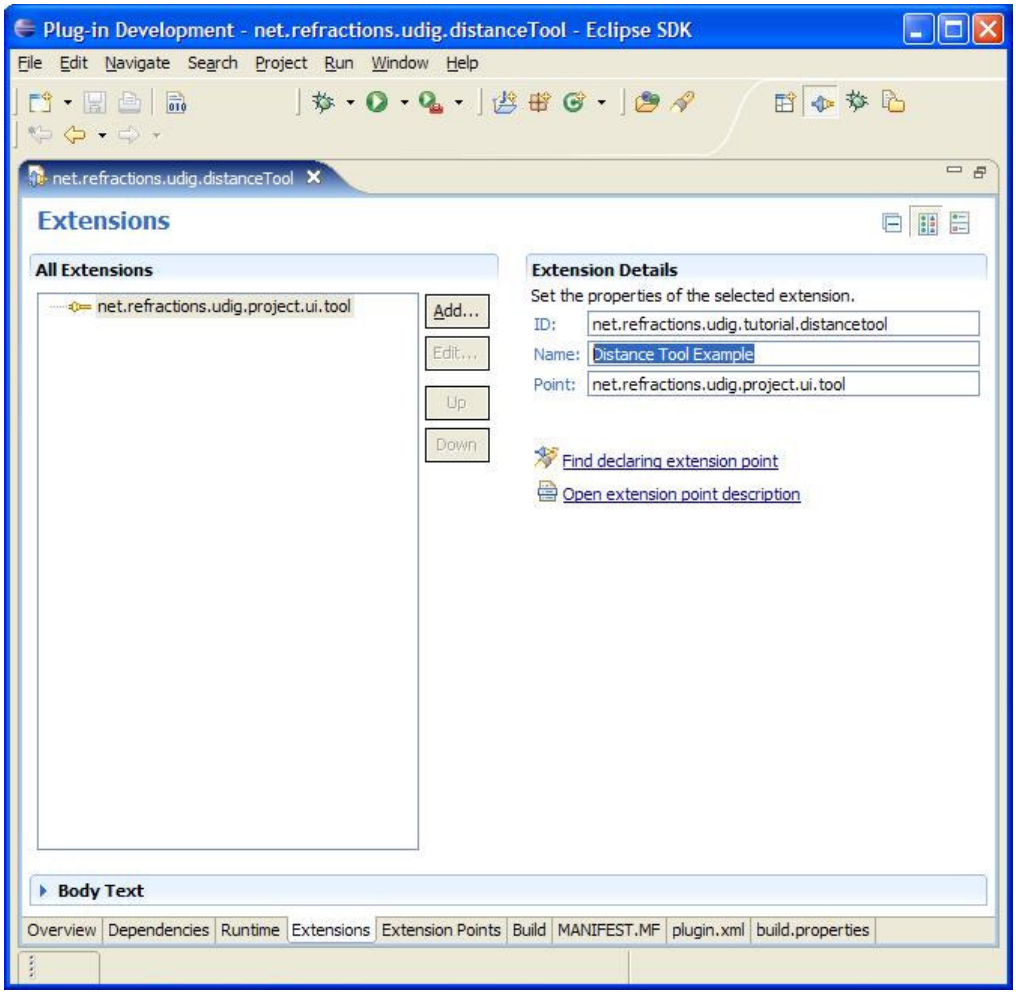


Figure 10 - Enter Tool Extension Data

24. Right click on newly added extension and select **New → 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.

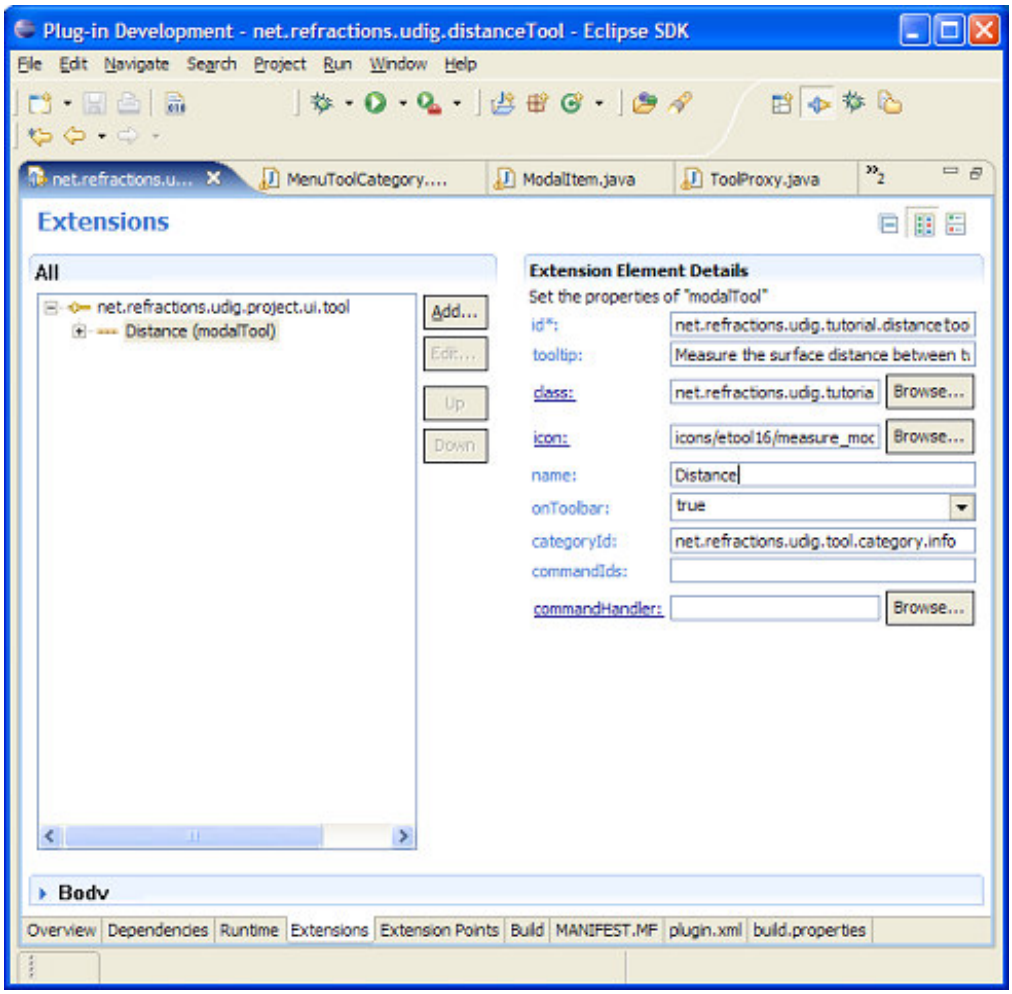


Figure 11 - Completed Modal Tool Definition

32. Right click on net.refractions.udig.tutorial.distancetool (modalTool) and select New → 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.

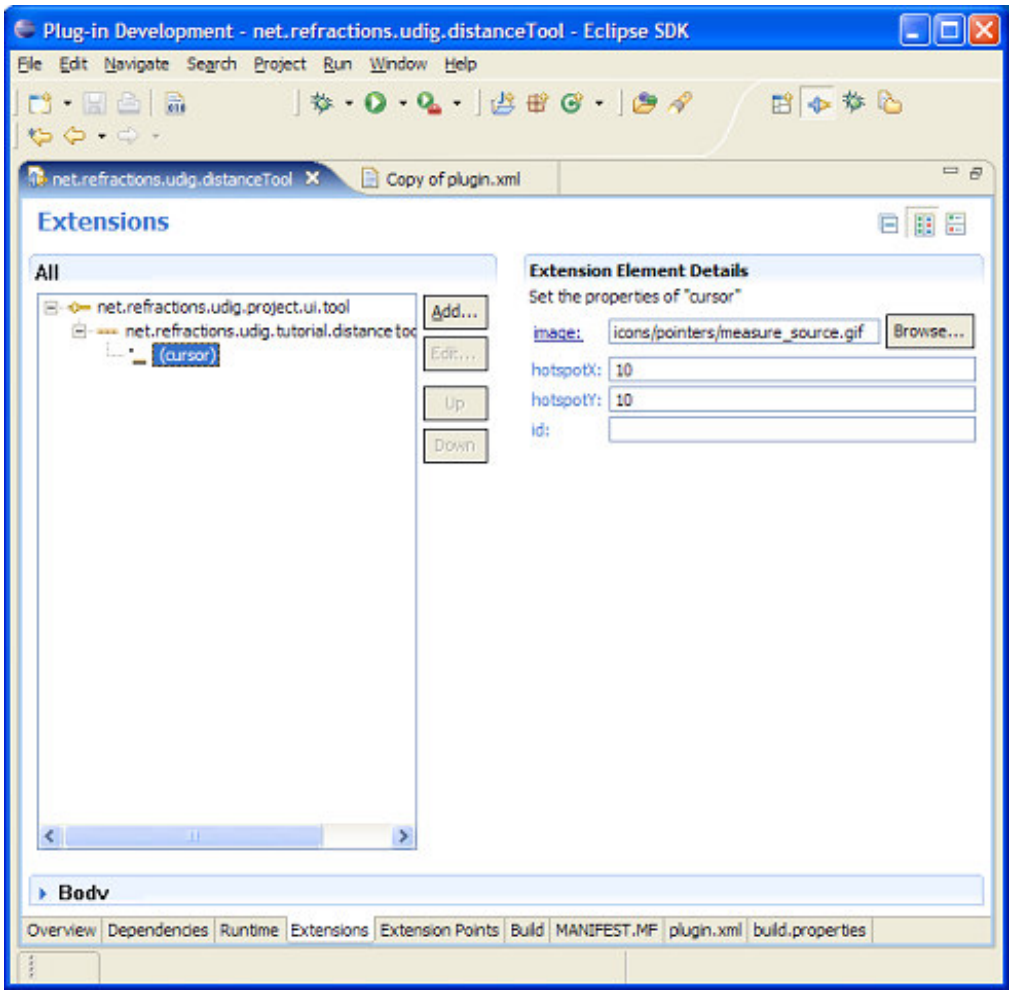


Figure 12 - Tool Cursor Definition

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.

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**.

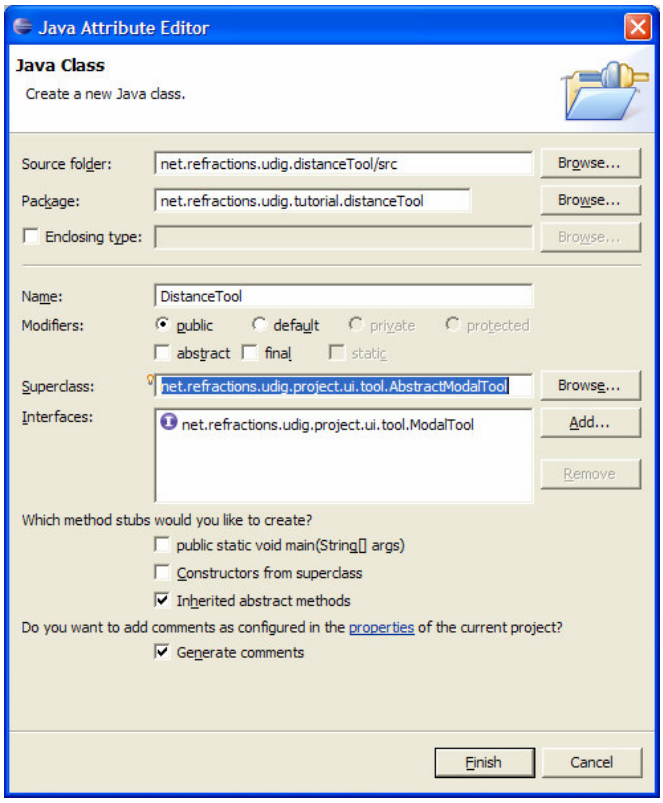


Figure 13 - New Class Wizard

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

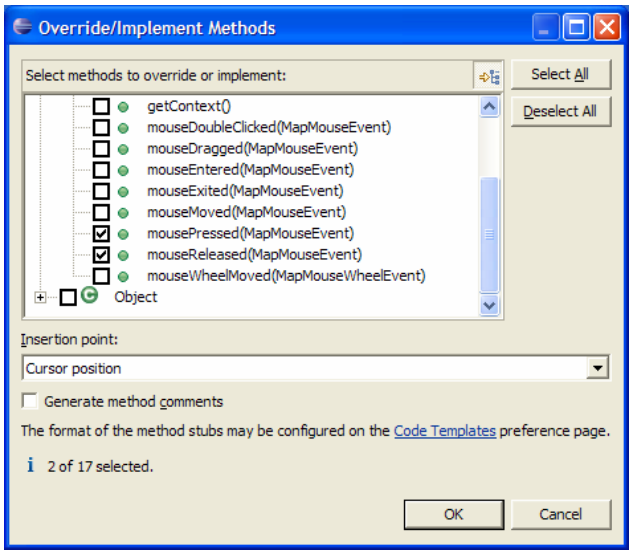


Figure 14 - Override Methods Dialog

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

```
public DistanceTool() {
    // Register for mouse events
    // Options are:
           // MOUSE
           // MOTION
           // WHEEL
    super(MOUSE);
}
```

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.

```
public void mouseReleased(MapMouseEvent e) {
    Coordinate end=getContext().pixelToWorld(e.x, e.y);
    try {
           double distance=CRS.distance(start, end, getContext().getCRS());
           displayOnStatusBar(distance);
    } catch (Exception e1) {
           displayError();
    }
}
```

14. Implement the displayError () method.

```
private void displayError() {
    final IStatusLineManager statusBar = getContext().getStatusBar();
    if( statusBar==null )
           return; // shouldn't happen if the tool is being used.
           getContext().updateUI(new Runnable() {
           public void run() {
                  statusBar.setErrorMessage("Unable to calculate the
distance");
           }
    });  }
```

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 Compiling the uDig Plug-ins).
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 http://udig.refractions.net/confluence/display/UDIG/Walkthrough+1 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