Working from Gephi's source

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Presentation of this tutorial

This tutorial explains how to get and modify Gephi's source code, and build Gephi from it.
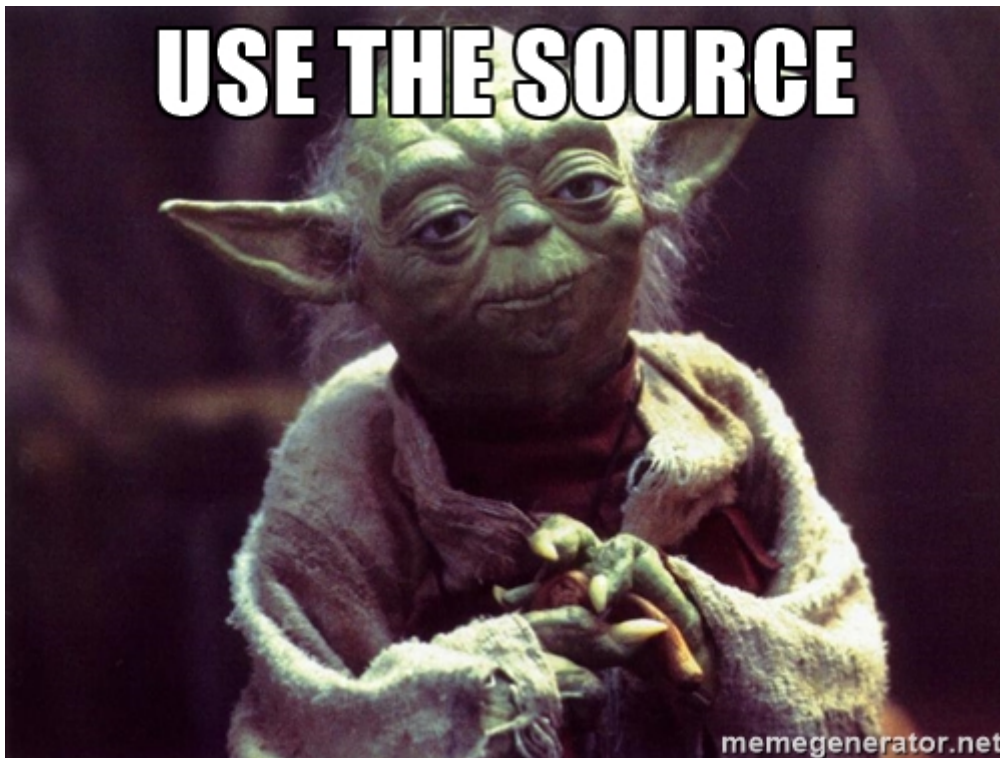

Figure 1. The obligatory meme

We will:

- download the source code
- run Gephi from the source
- modify Gephi's openGL visualization engine
- run Gephi in this modified version

The modified version of Gephi that we will implement will have for effect to add circles around

nodes communities.

This project originates from Susie Lu's creation.
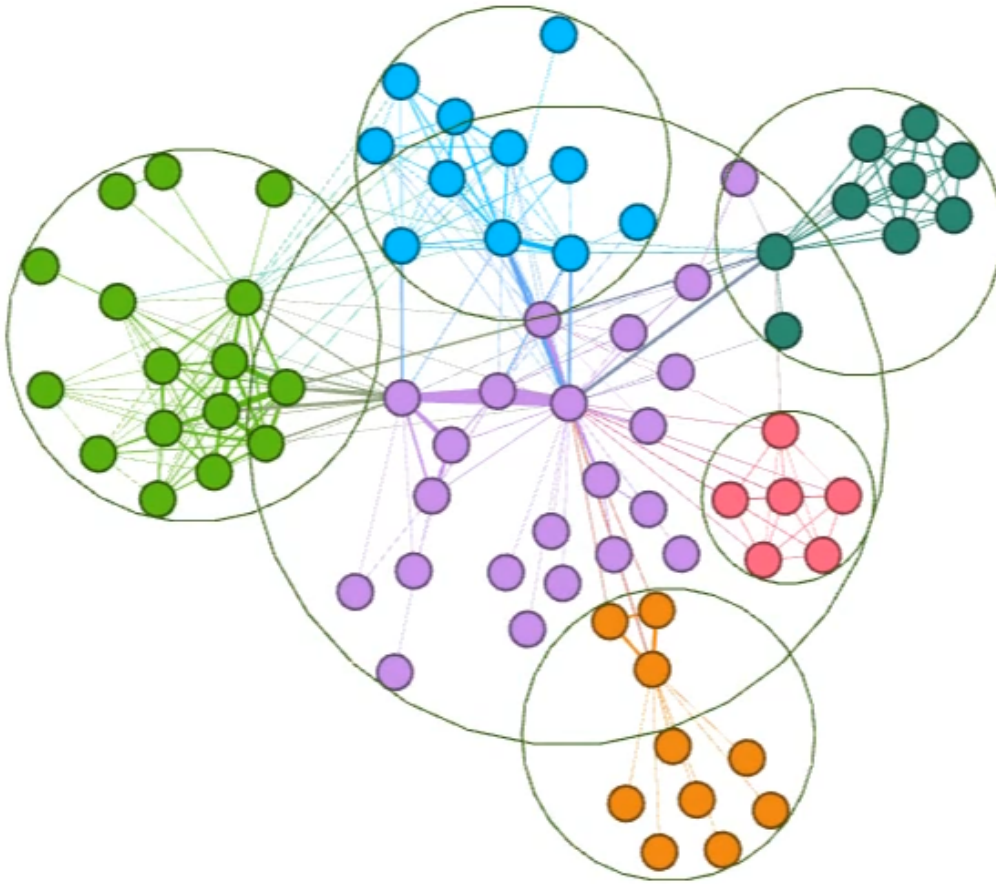
We should get something like:

▶ https://www.youtube.com/watch?v=Y3jk-_QaFx4 *(YouTube video)*

Figure 2. Circles enclosing communities

link to animated version: https://www.youtube.com/watch?v=Y3jk-_QaFx4

For this tutorial you will need:

- some knowledge of Java.
- NetBeans installed (up to date instructions here). Eclipse, IntelliJ or any other code editor won't do.
- a good internet connection since we will download a lot of small dependencies.
- no Github account is necessary (if you have one, fork Gephi before doing all the steps below).

Downloading the source code

1. Open NetBeans.

2. In NetBeans, go to `Team` → `Git` → `Clone`

(can't find this menu in NetBeans? read an alternative just below)

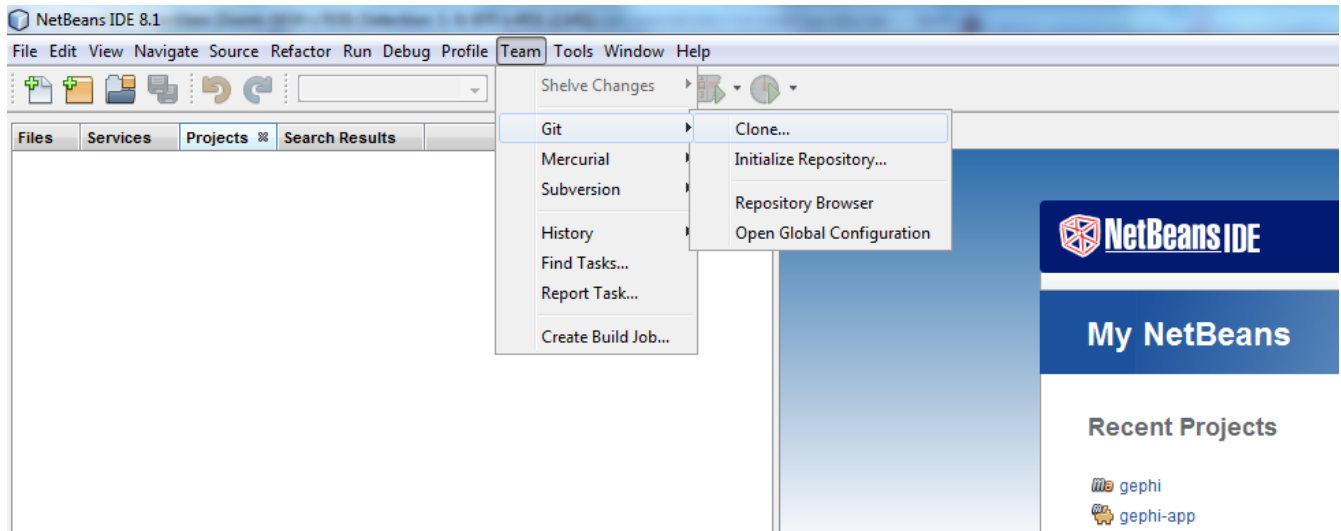*Figure 3. Cloning the gephi source*

NOTE

if you already have projects opened in NetBeans, the menu Team → Git → Clone is replaced by:
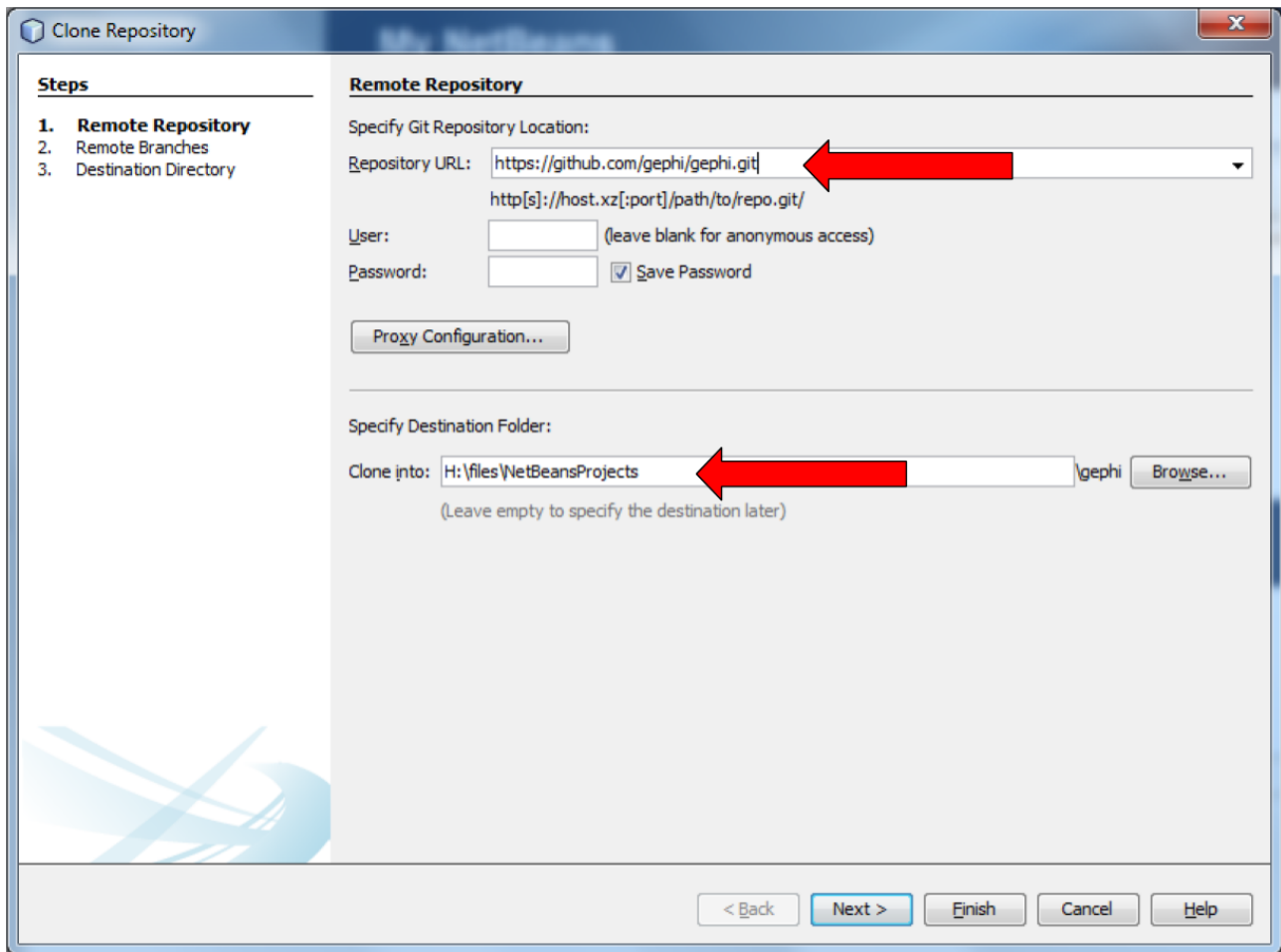
```
Team -> Remote -> Clone
```

Figure 4. Cloning the gephi source

- For `Repository URL`, put the address of the Gephi repository on Github, which is:

https://github.com/gephi/gephi.git

- for `Clone into`, select a folder on your disk. No need to create a new folder inside, the cloning process will do it.

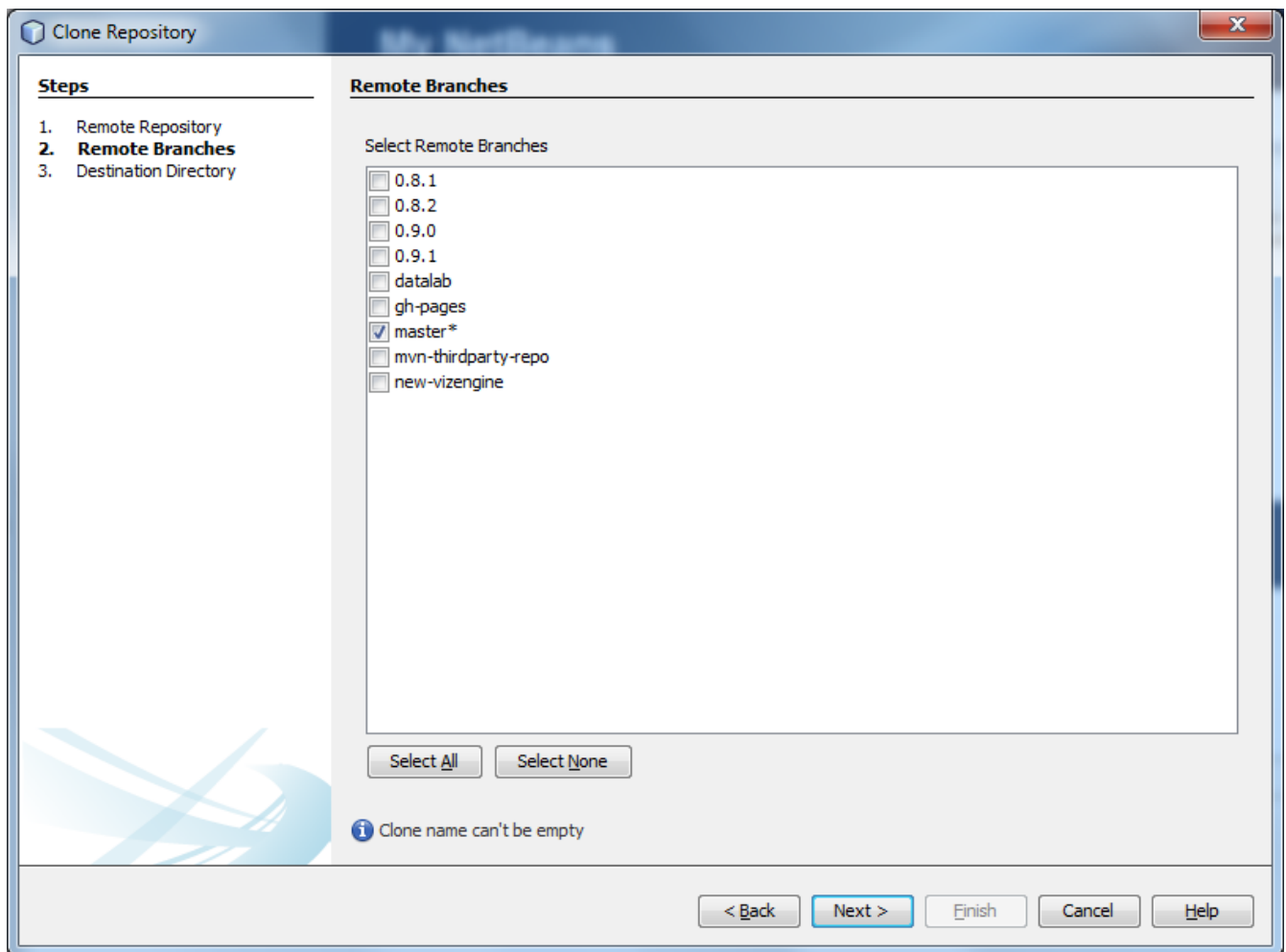- Github User and password can be left empty

- Then click on `Next`

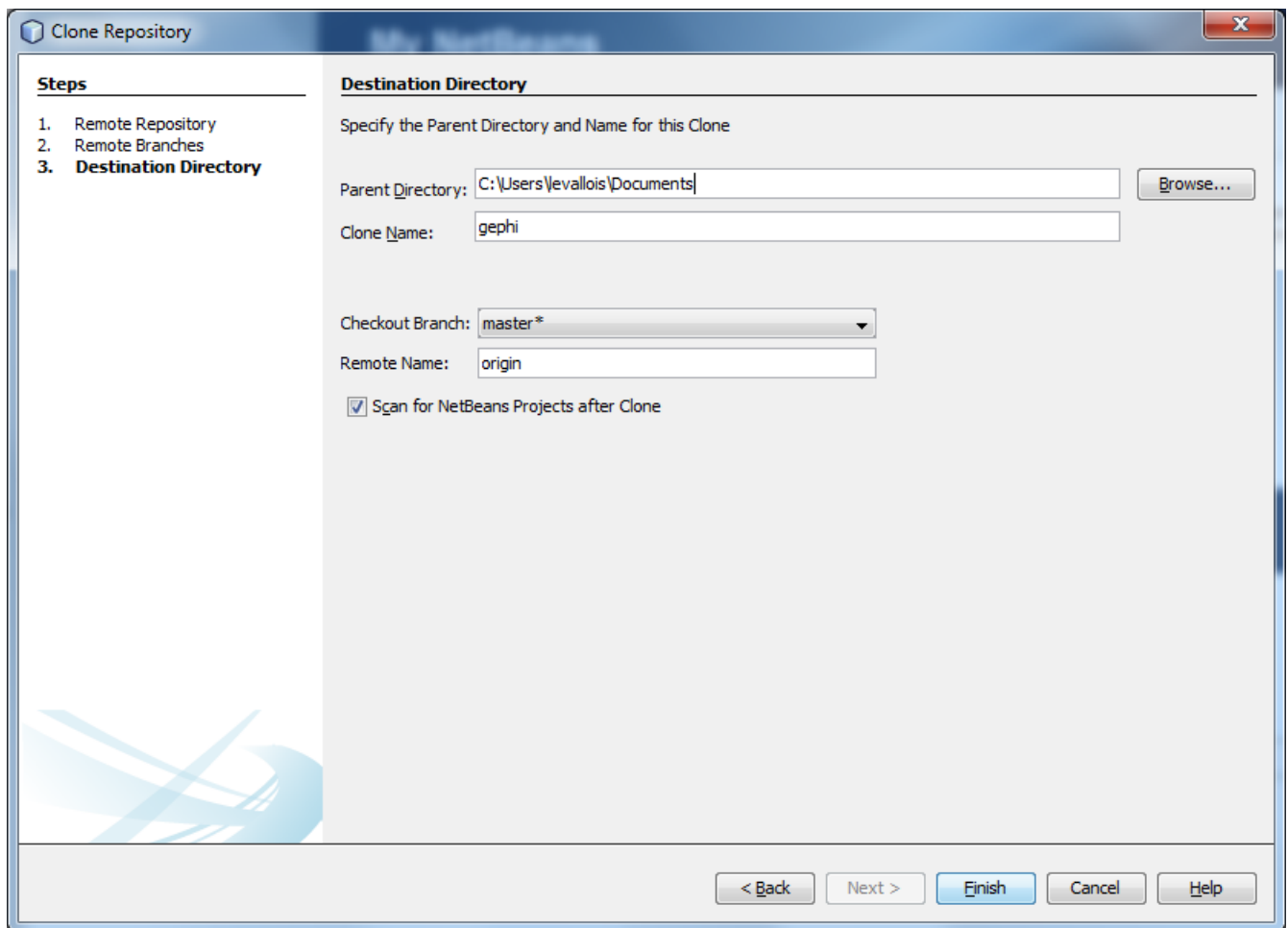*Figure 5. Select Master and click next*

Figure 6. Leave as it is and click on Finish

At this step, NetBeans starts downloading the source code of Gephi - not all of it. Should take a couple of minutes, then:
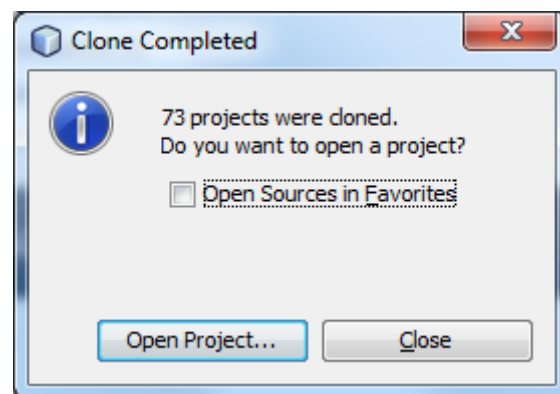

Figure 7. Click on Open Project

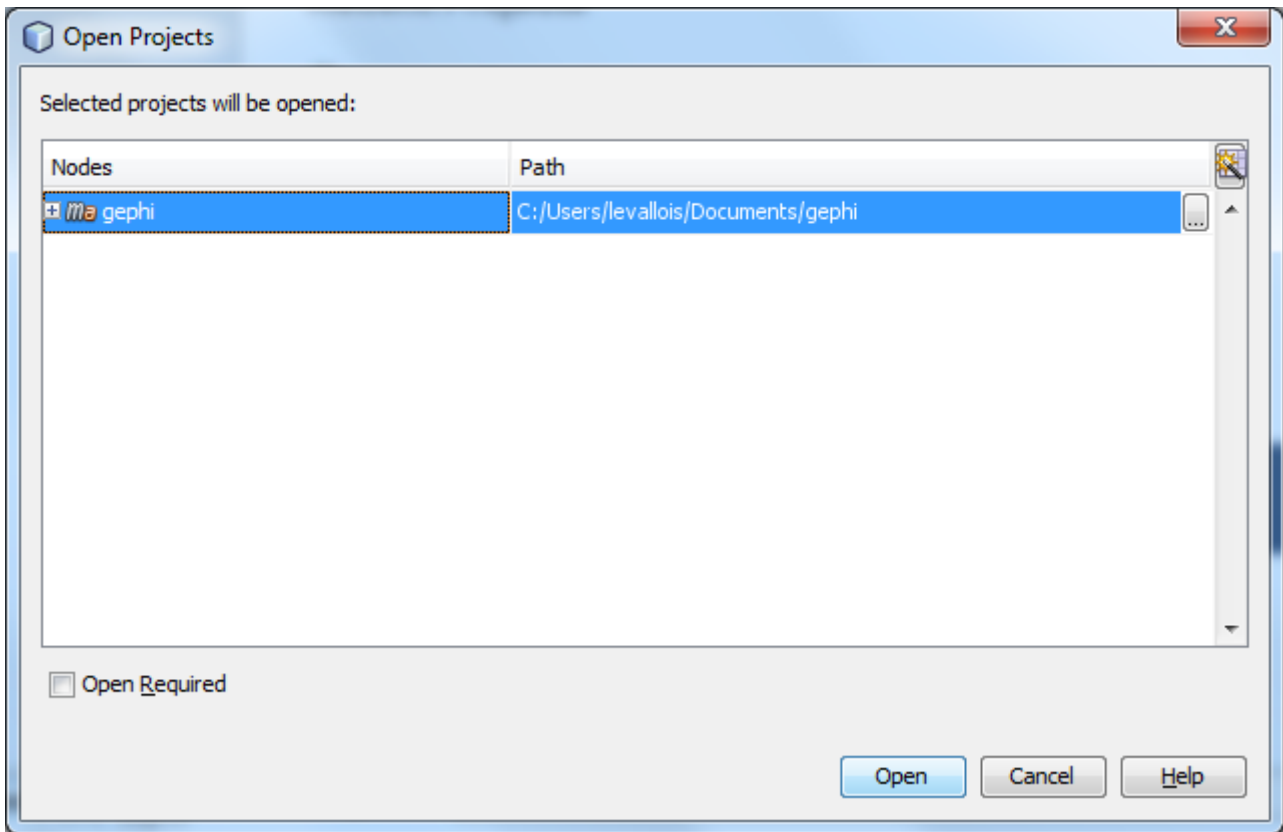Select (highlight in blue) the line mentioning Gephi, and click on "Open"

Figure 8. Click on Open Project

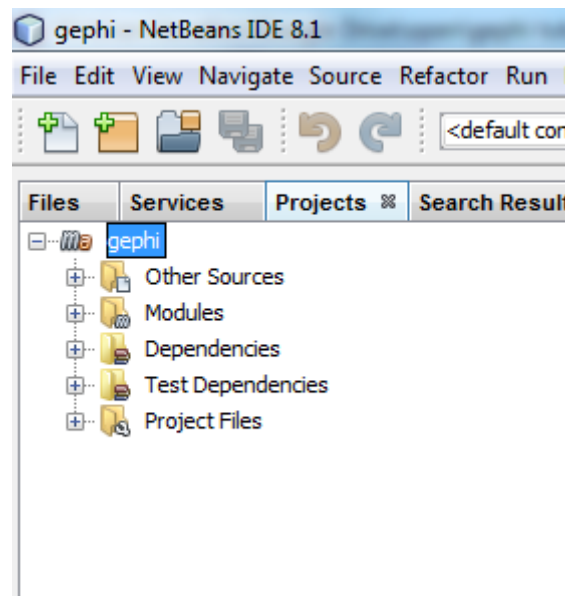You should now see Gephi as a project on the left in NetBeans:

Figure 9. Gephi project

Right click on the project and select "Build with dependencies". This will download all the rest of the source, which can take roughly 5 to 20 minutes.
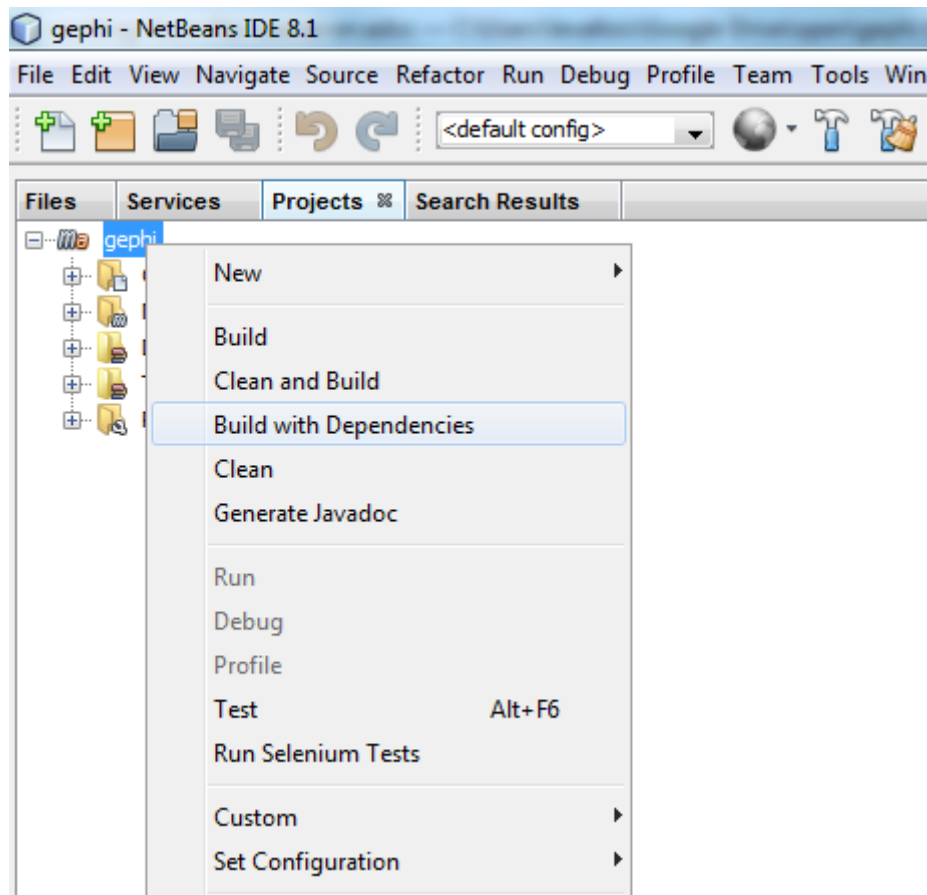
Figure 10. Building the project

Running Gephi from source

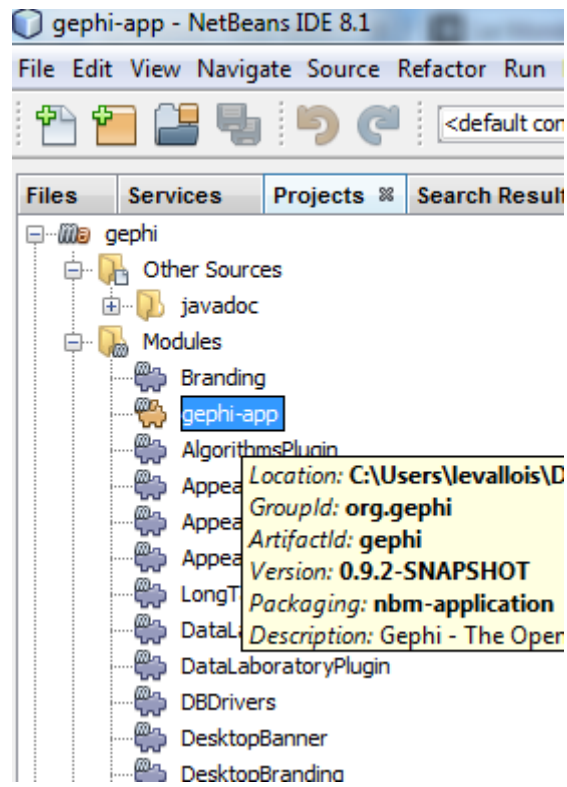When the build is complete, expand the folder "Modules" of the Gephi project, and double click on "gephi-app":

Figure 11. Opening the gephi-app submodule

This opens a new project on the left of NetBeans, called "gephi-app". This is a submodule of Gephi, dedicated to managing its launch.
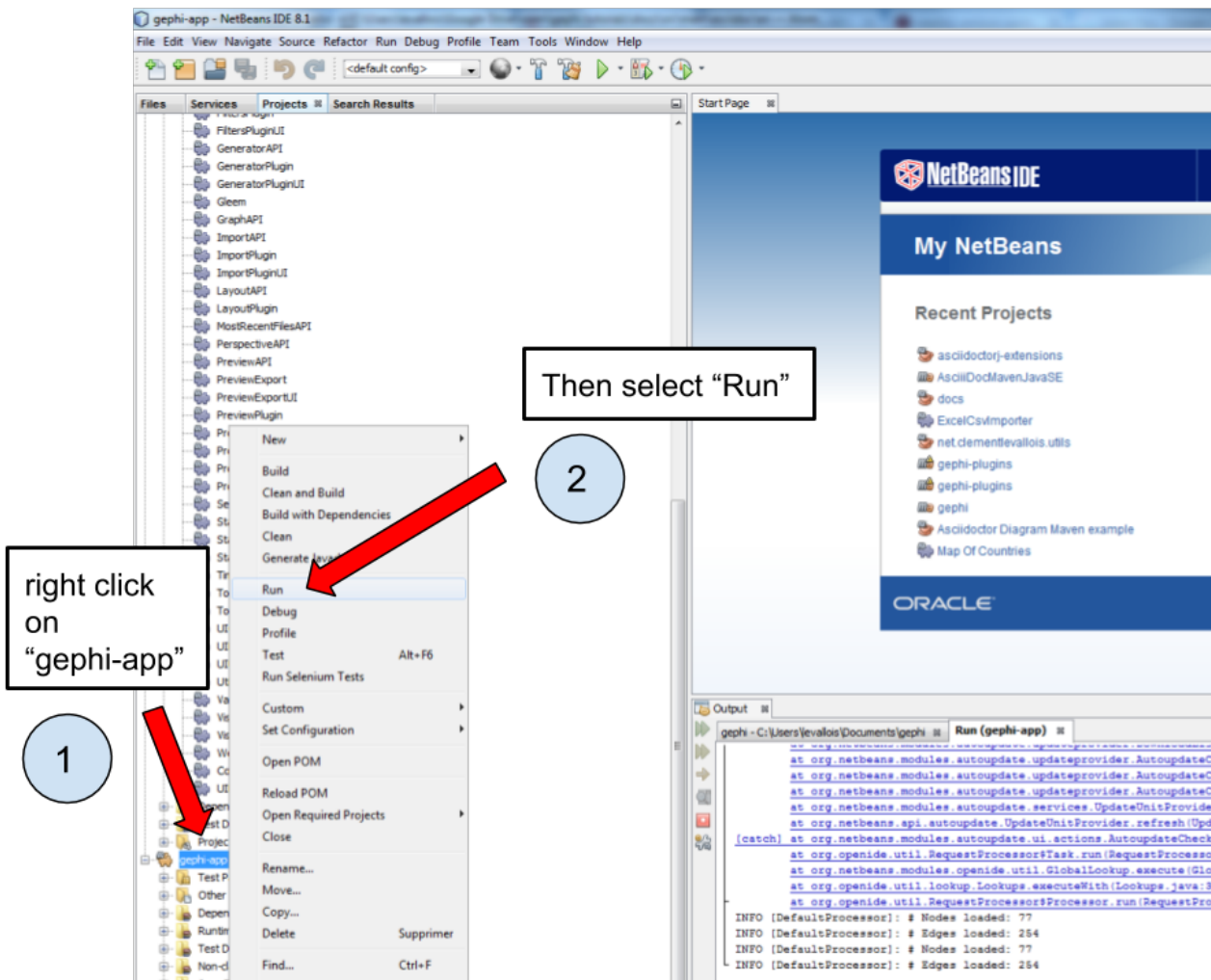
Figure 12. Launching Gephi

And Gephi launches!

Now that we know how to run Gephi from source, we can modify the source and see how it goes.

Modifying Gephi's openGL visualization engine

We are going to add circles which will enclose groups of nodes (aka communities). In three steps:

1. Open the `VisualizationImpl` module

2. Create simple classes for the circles

3. Add some code in the class which manages the display in OpenGL, so that circles get created

1. Open the `VisualizationImpl` module

In the gephi project, in the folder Modules, double click on the `VisualizationImpl` module:
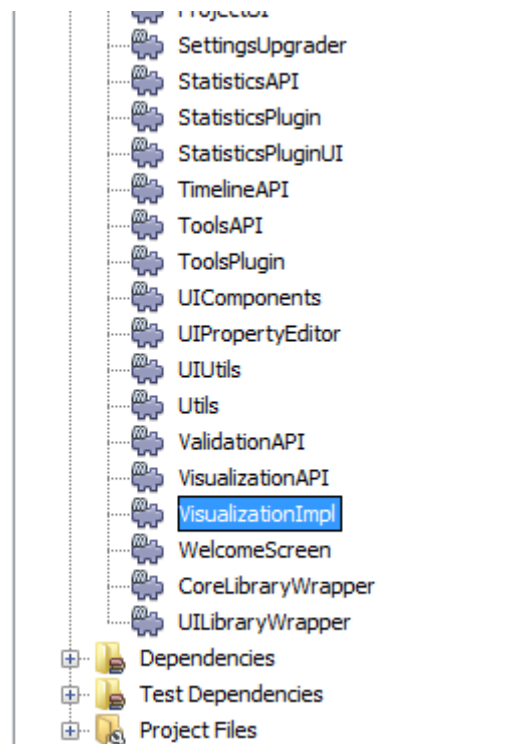

Figure 13. Opening VisualizationImpl

2. Create simple classes for the circles

Create a new package and add 3 classes in it: `Circle.java`, `Point.java`, `SmallestEnclosingCircle.java`.
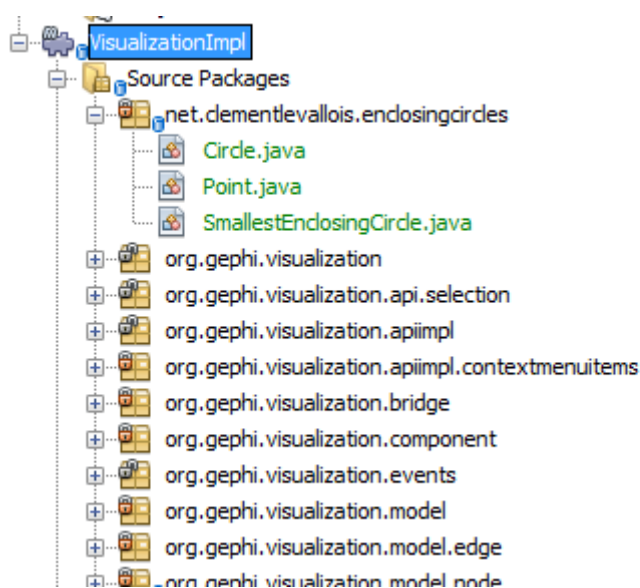
(I merely adapted these classes from this website)

Figure 14. Three classes

The code of these classes [can be found here](#).

3. Add the circle creation logic to the class managing the OpenGL display

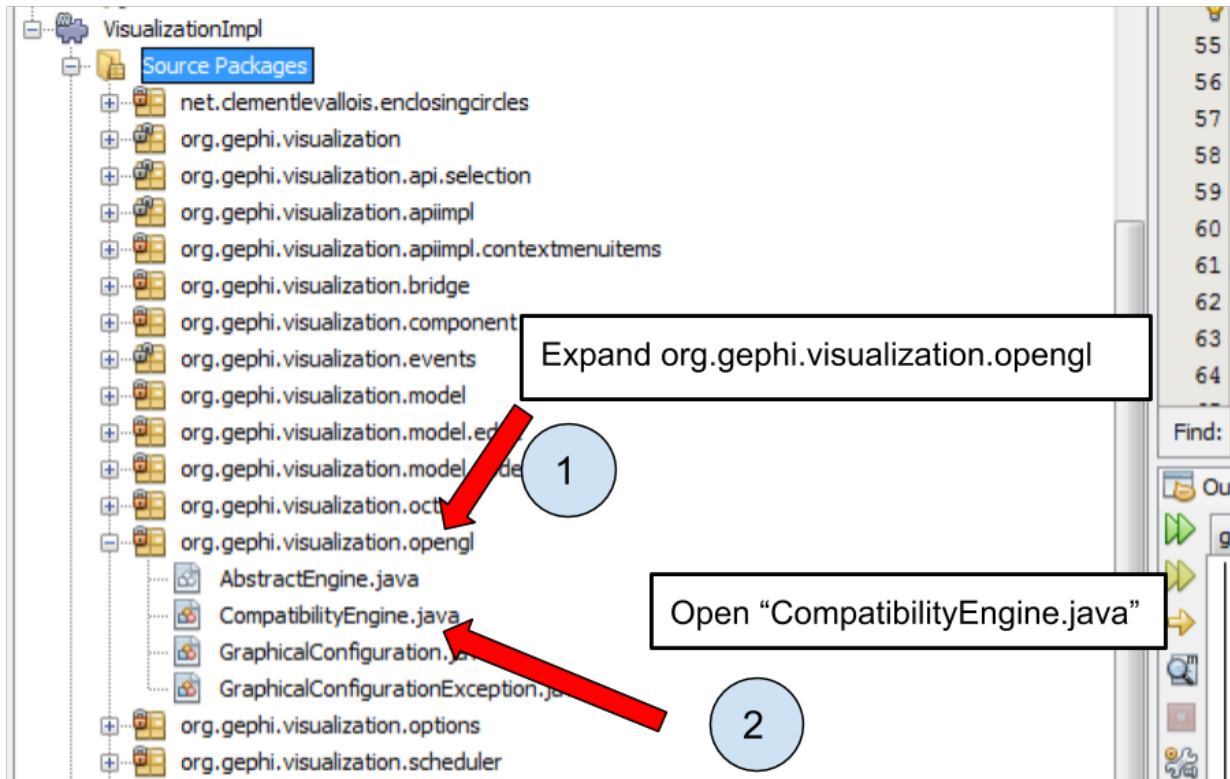Open the package `org.gephi.visualization.opengl`, and inside open `CompatibilityEngine.java`:

Figure 15. opening CompatibilityEngine.java

No need to understand most of the code in this class.

But we see that starting at [line 194](#), a loop on nodes starts:

We will put nodes in a map (declared above, at [line 155](#)) where:

- keys are the name of the cluster nodes belong too,
- values are the Set of Nodes corresponding to the cluster.

(yes, this implies the nodes must have an attribute called "Modularity Class" showing the cluster they belong to)

The code you should add to assign nodes to clusters in the map is in [lines 197-203](#)

Then, [lines 210-245](#) iterate on the map, and create the circles around clusters.

The logic of the circle creation in OpenGL can be understood rather easily, by copying and modyfying the code used just above for the creation of nodes, and by looking at the online

documentation on how to create shapes in OpenGL.

That's it. Now just run Gephi from source as we did before. From Gephi, open a network where nodes have a "Modularity Class" attribute, and Gephi will draw circles around nodes from the same clusters:

▶ https://www.youtube.com/watch?v=Y3jk-_QaFx4 *(YouTube video)*

More tutorials on using the source code of Gephi

- The Gephi readme with some instructions for developers

the end

Visit the Gephi group on Facebook to get help,

or visit the website for more tutorials