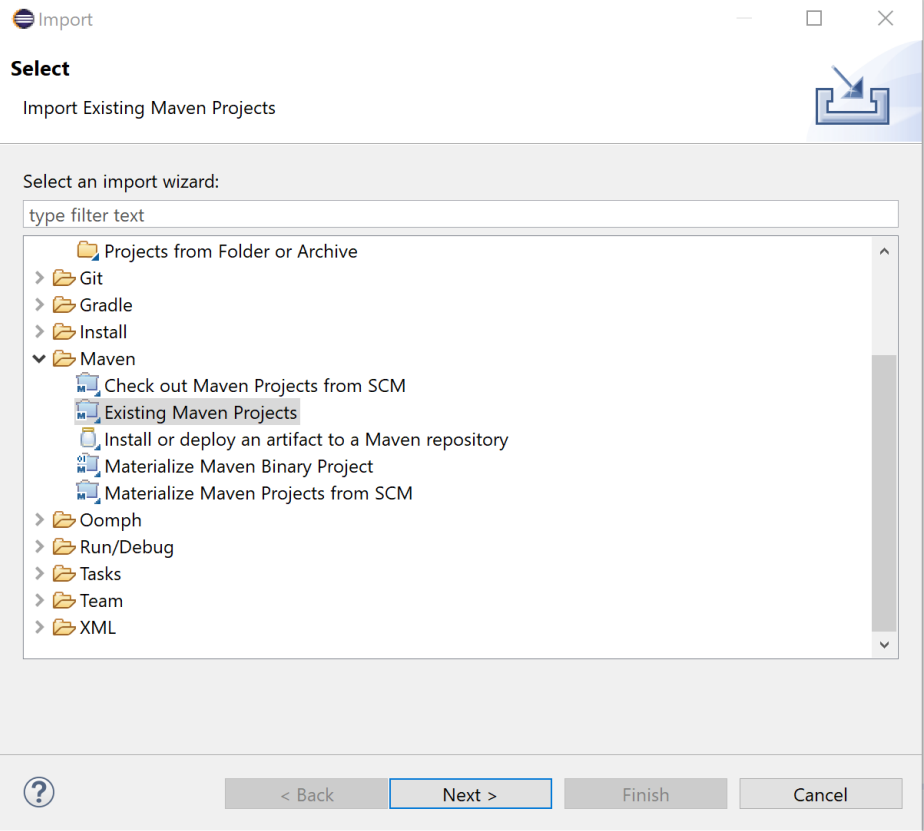


## Assignment 1: Ms PacMan vs Ghost Team

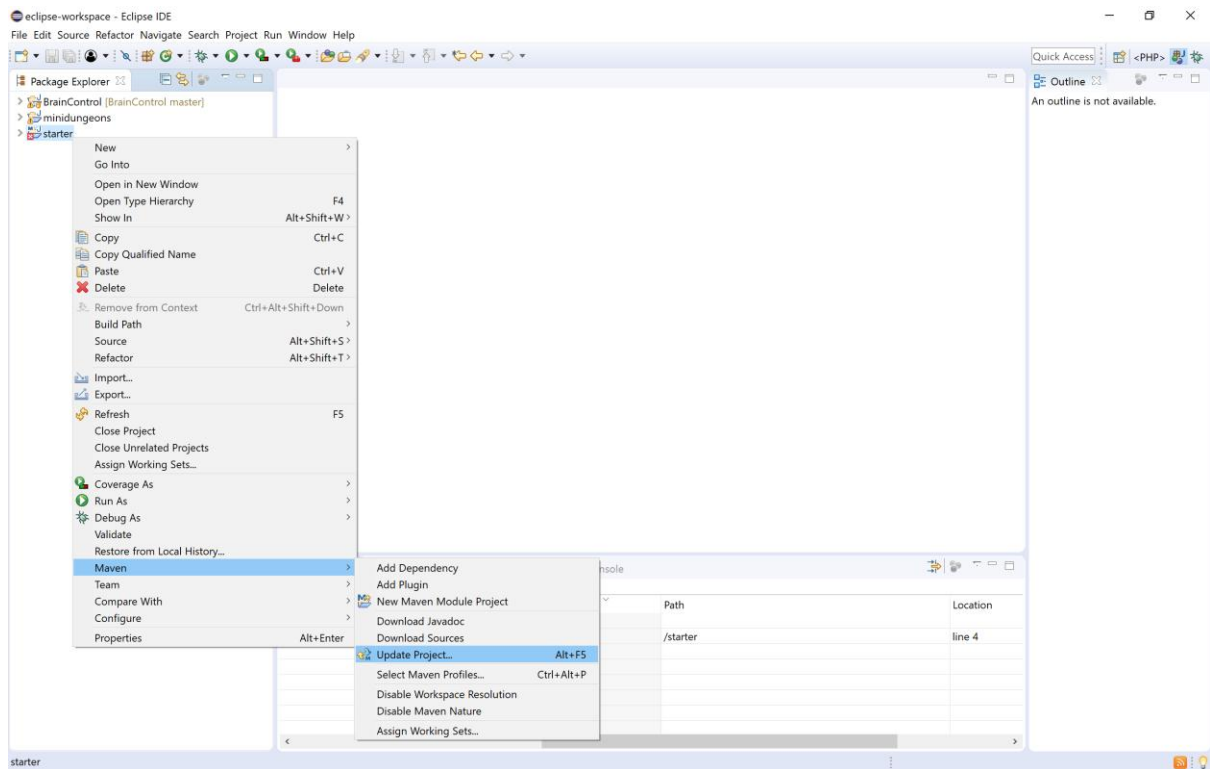
1. Download and extract the zip file.
2. Follow the setup instructions.
3. Run the game a few times. You should notice that you will get a different score every time. Record the scores.
4. Implement a new tree search algorithm for the Pac-Man (i.e. YourSearchController.java" inside the folder "TreeSearchMsPacMan-master\src\main\java\examples\StarterPacMan"). You can use any search algorithm: tree-search, reinforcement learning, neural networks, genetic algorithms, etc.  
You can implement more than one search algorithm if you have time.
5. Test your new search algorithms several times and record the scores.
6. Write a short report (< 5 pages). It should answer the following questions:
  - a. Describe your search algorithm. What parameters are used (i.e. number of layers, number of nodes), how long does it take to train, etc.
  - b. What inputs were used by your search algorithm.
  - c. Does your algorithm achieve higher or lower score than the default algorithm?
7. Repackage your codes into a zip file and submit to my email along with the report.

### Setup instructions:

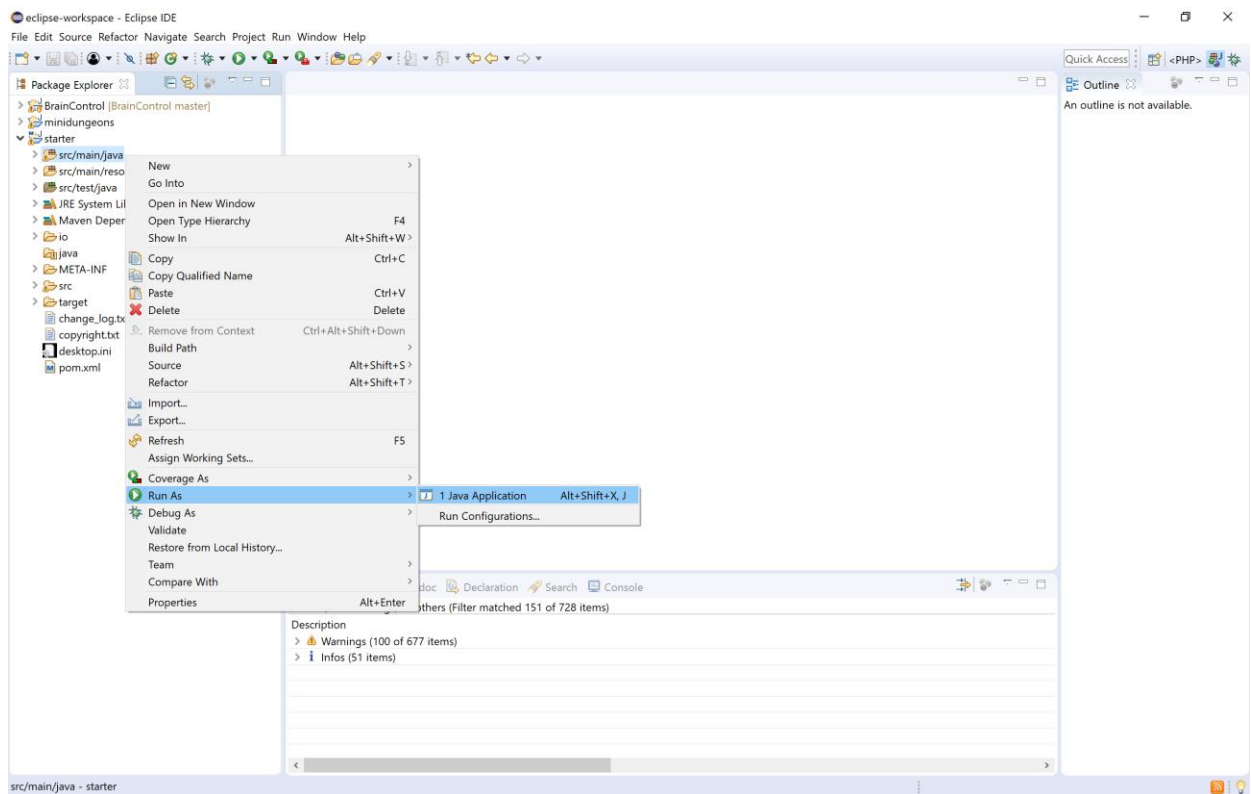
- 1) Download and unzip the folder.
- 2) Open Eclipse Java, File -> import -> existing Maven project, then open PacManEngine-master folder (the folder which contains src, target, pom.xml etc...)



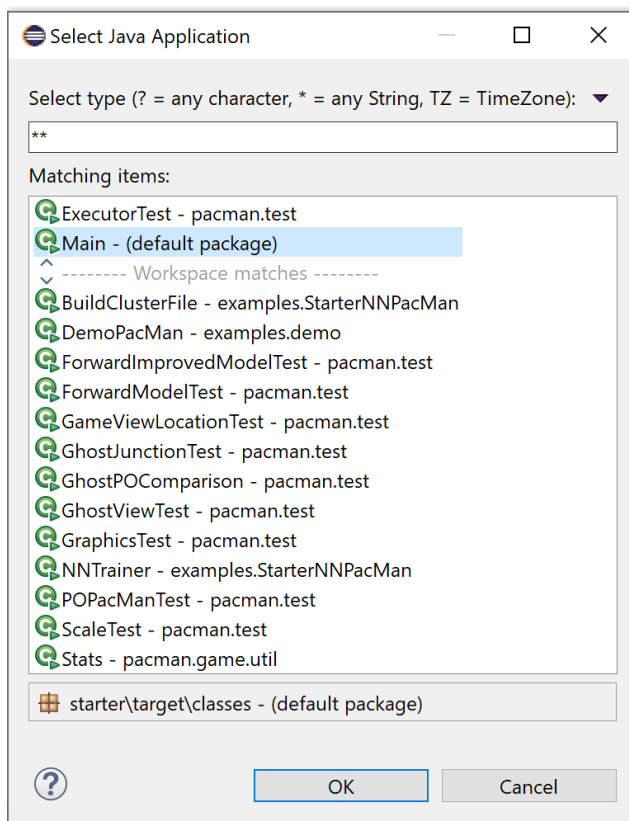
### 3) Right-click the project->Maven->update project



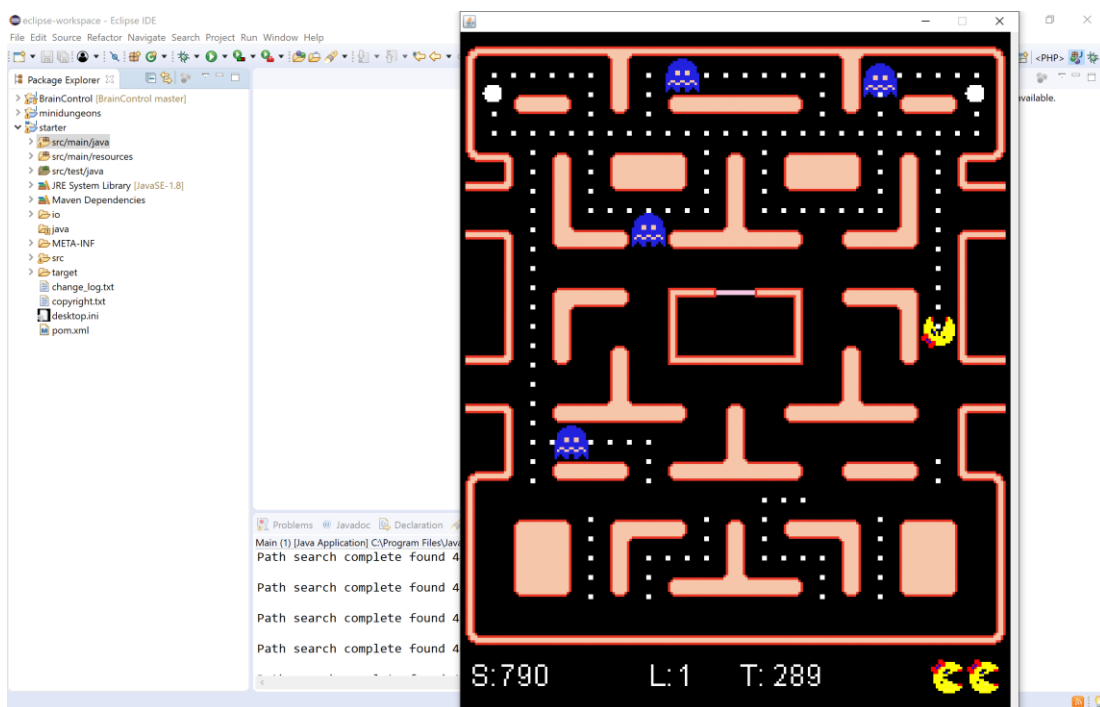
### 7) Right click src/main/java -> Run As -> Java Application



8) Select Main – (default package) and click ok



9) The game will run



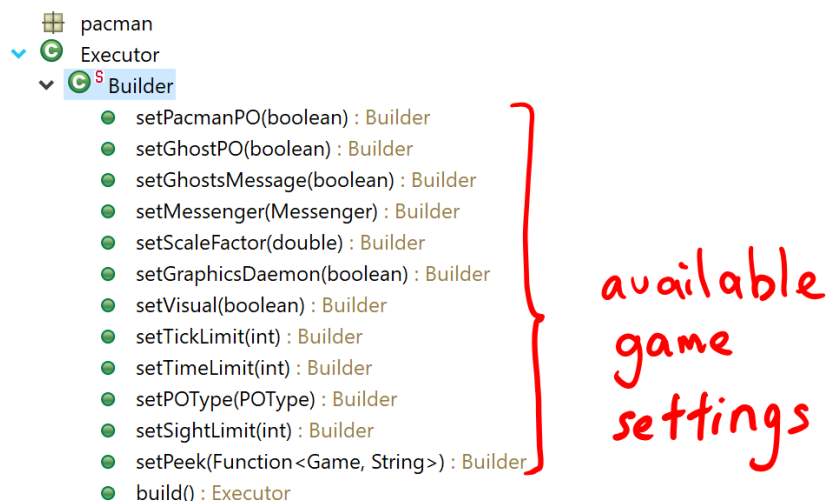
## What to modify?

Open the Main.java file. This file is the entry point of the game which you can configure the game settings. You can change the scale factor, sight limit, whether to on or off visuals in this file.

For example, to increase the size of game visual, we set scale factor to 3.

```
Executor executor = new Executor.Builder()
    .setVisual(true)
    .setTickLimit(4000)
    .setScaleFactor(3)
    .build();
```

Here are the list of available game settings that you can modify:



Next, to remove the time limit imposed on the game, we change the last line of the file from:

```
executor.runGameTimed(new MyPacMan(), new MASController(controllers));
```

To

```
executor.runGame(new MyPacMan(), new MASController(controllers), 100);
```

Notice the 3<sup>rd</sup> argument is 100, which indicates 0.1s delay in each time-step in order to reduce the speed of the game for us to see.

Finally, you can modify the **MyPacMan** class to implement your AI method. The class should contain a getMove method that returns a single MOVE (LEFT, RIGHT, TOP, DOWN) for each time step.