

USSR: UNIVERSAL SIMULATOR FOR SELF-RECONFIGURABLE ROBOTS

QUICKSTART GUIDE

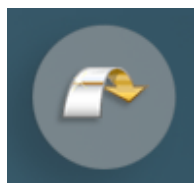
By Danish Shaikh

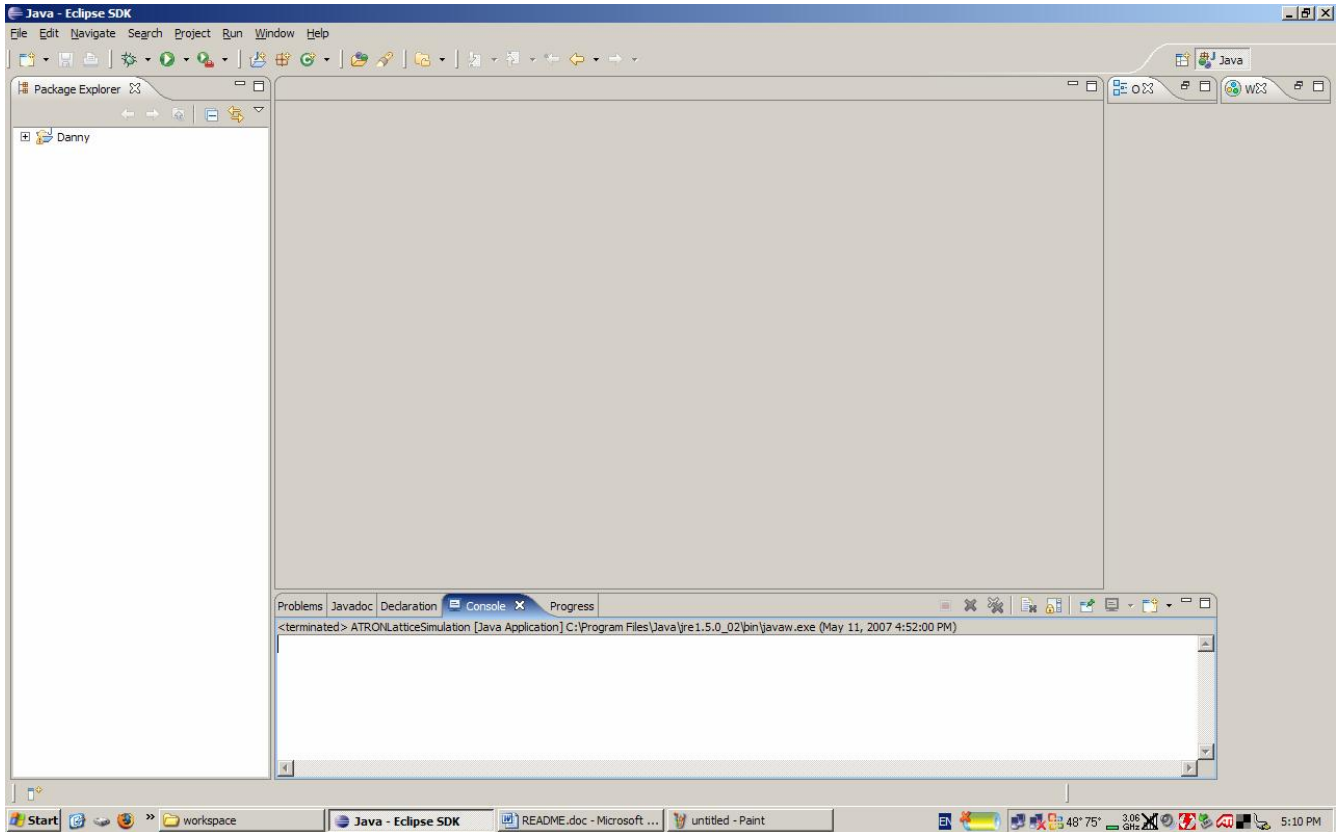
INSTALLATION INSTRUCTIONS (WINDOWS):

1. Download and install the latest version of the Java Development Kit (JDK) and the Java Runtime Environment (JRE), available at <http://java.sun.com/products/archive/>.
2. Download and install the open source Eclipse SDK 3.2.2 (121 MB), required for compiling the Universal Simulator. Eclipse is available at <http://www.eclipse.org/downloads/>. The installation file is just a zip archive, and only needs to be extracted to any desired location.
3. Run Eclipse. It will ask you to define a workspace directory on your file system. You can use any existing directory or create a new one. The workspace directory is used to store your projects. Next you will see the Welcome screen below.



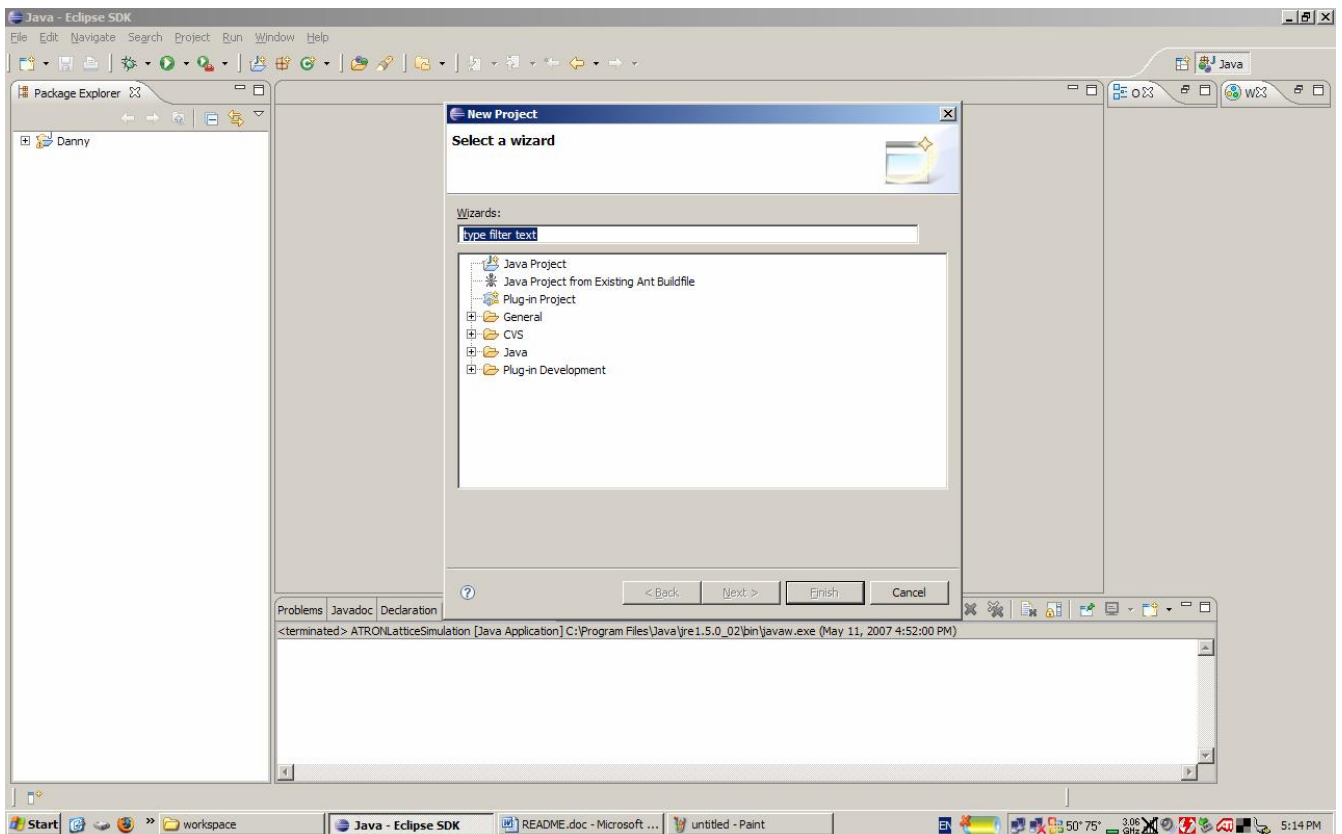
Click on the “Workbench” icon to go to the workbench view as shown below, which is the main environment.



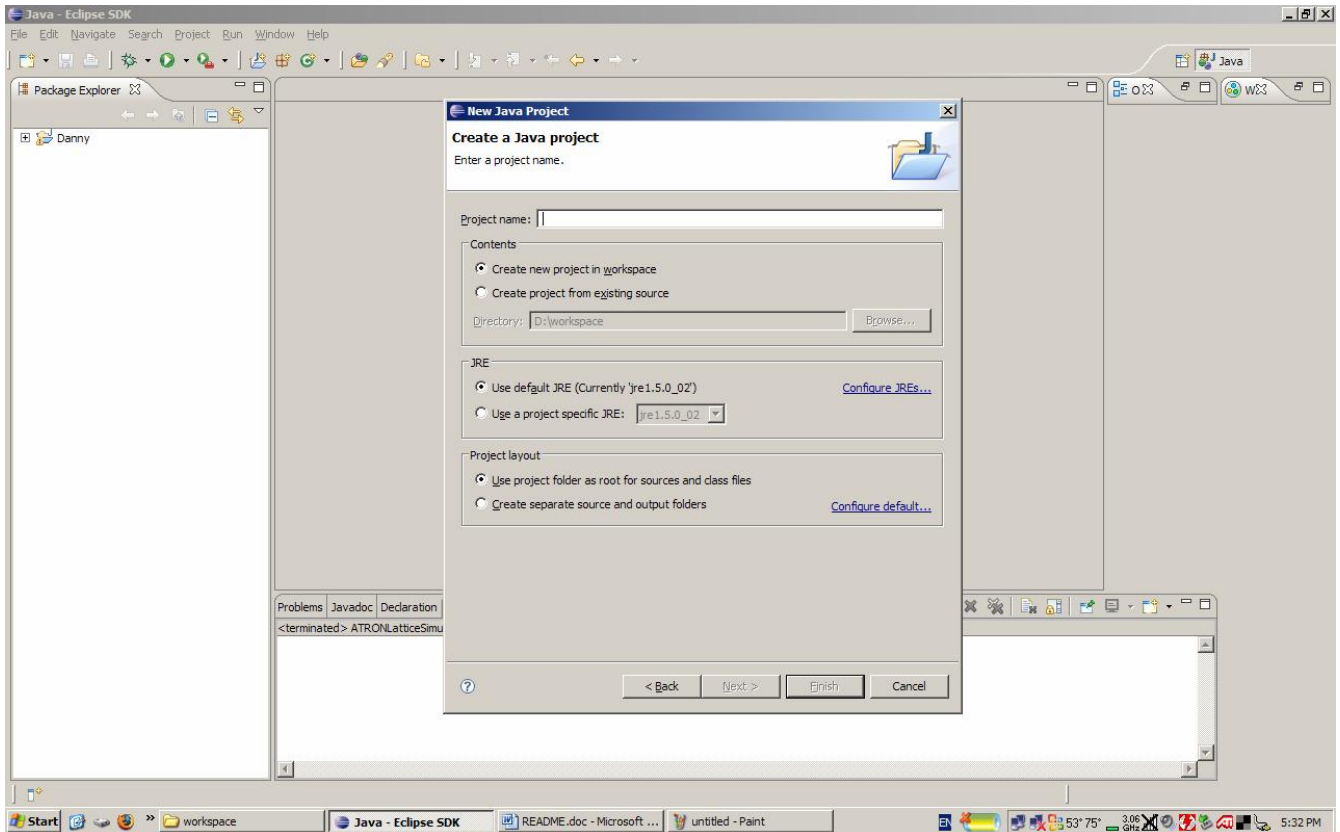


CREATING A NEW PROJECT:

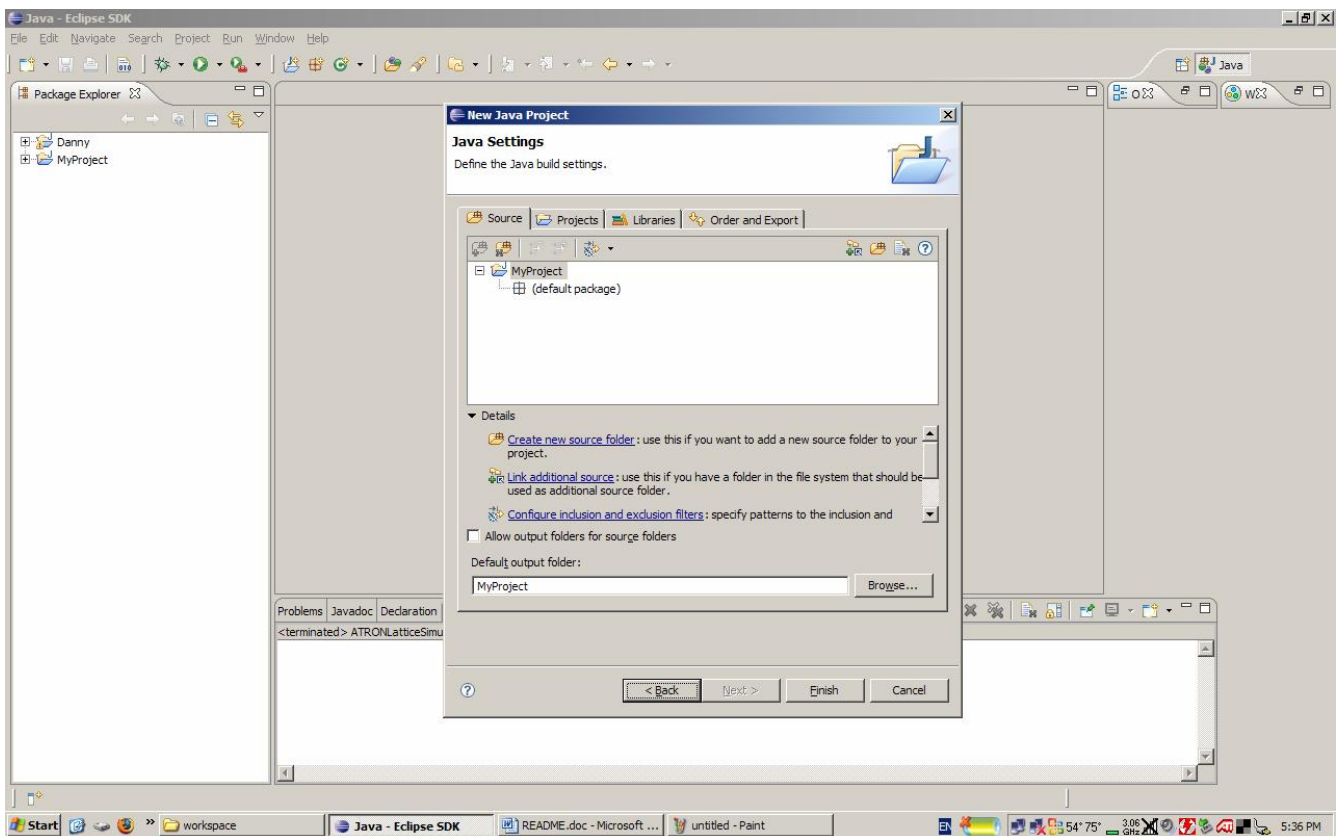
1. Go to **File à New à Project** and you will see a New Project Wizard screen.



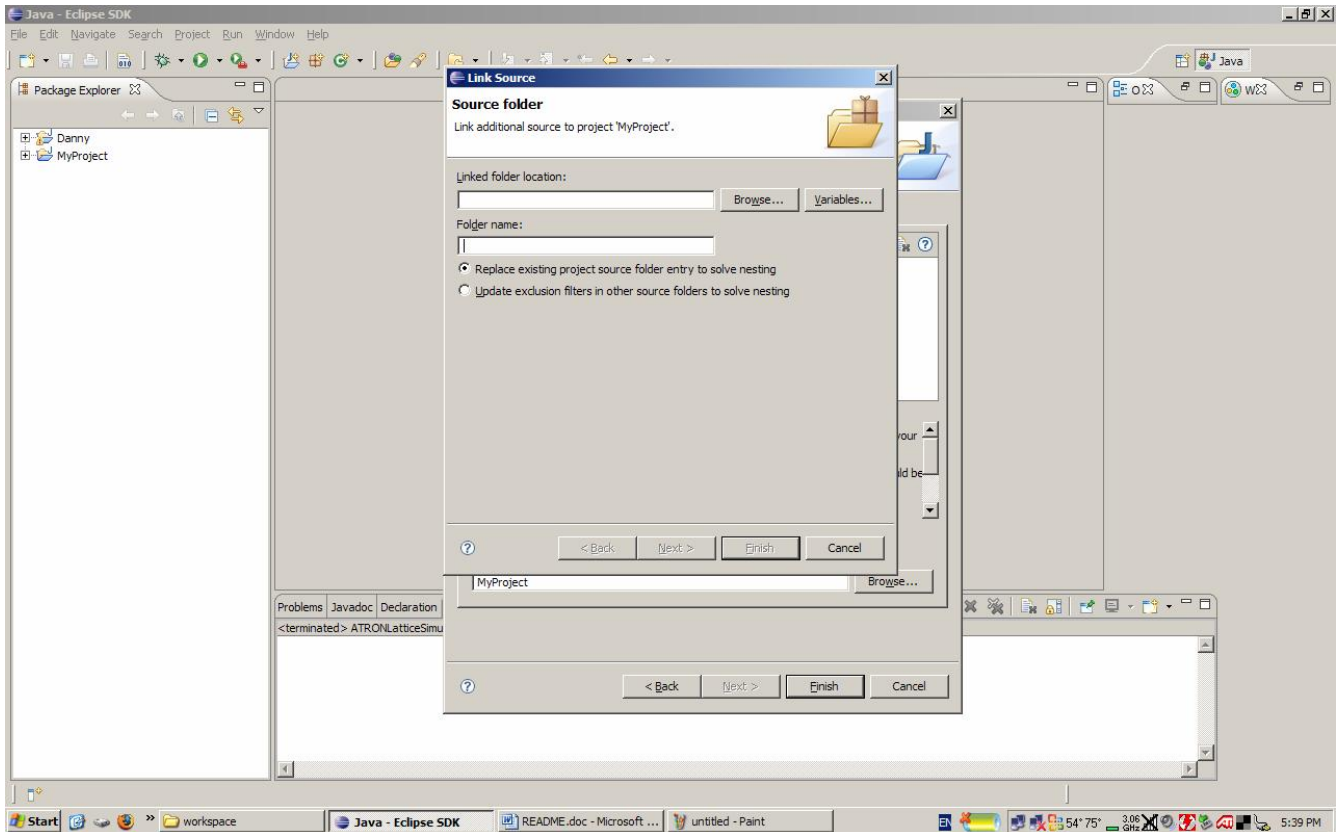
2. Select “Java Project” and then click on the “Next” button to proceed to the New Java Project screen.



3. Enter a name for the project and then click on the “Next” button to proceed to the Java build settings screen.



- Click on “Link additional source” to add directories where you have the Java source files (.java) that you want to use in your project.

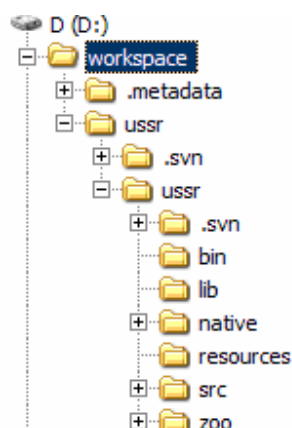


- Click on “Browse” and select a directory, from the directory tree, which contain the source files. If you have multiple directories with source files that you want to include in the build path, you have to add those directories one-by-one. You also have to specify a name for the folder in the text input field “Folder Name”. It can be any name you choose. Make sure that the “Replace existing project source.....” radio button is selected. After you have filled both text input fields, click on the “Finish” button to end.

NOTE: To compile the simulator correctly, you need to add **ALL** the following source directories –

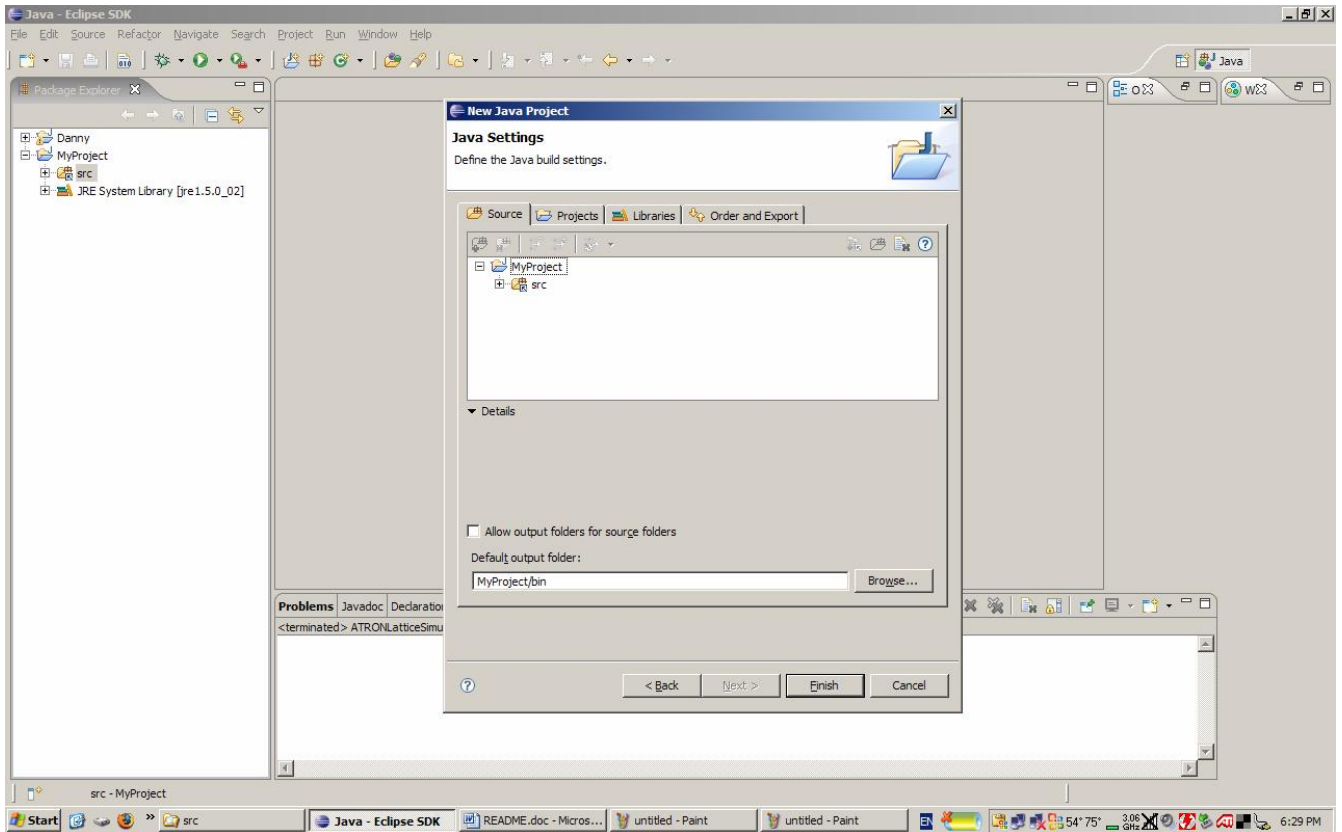
1. <LOCAL_PATH>\ussr\ussr\src
2. <LOCAL_PATH>\ussr\ussr\zoo\jME\src
3. <LOCAL_PATH>\ussr\ussr\zoo\jmepysics\src
4. <LOCAL_PATH>\ussr\ussr\zoo\jmepysics\impl\ode\src
5. <LOCAL_PATH>\ussr\ussr\zoo\jmepysics\tutorial

where <LOCAL_PATH> is the path on your hard drive where the workspace directory is located. For e.g., if your workspace directory is “D:\workspace”, and the directory structure for the simulator source is as shown below, then the above paths are –

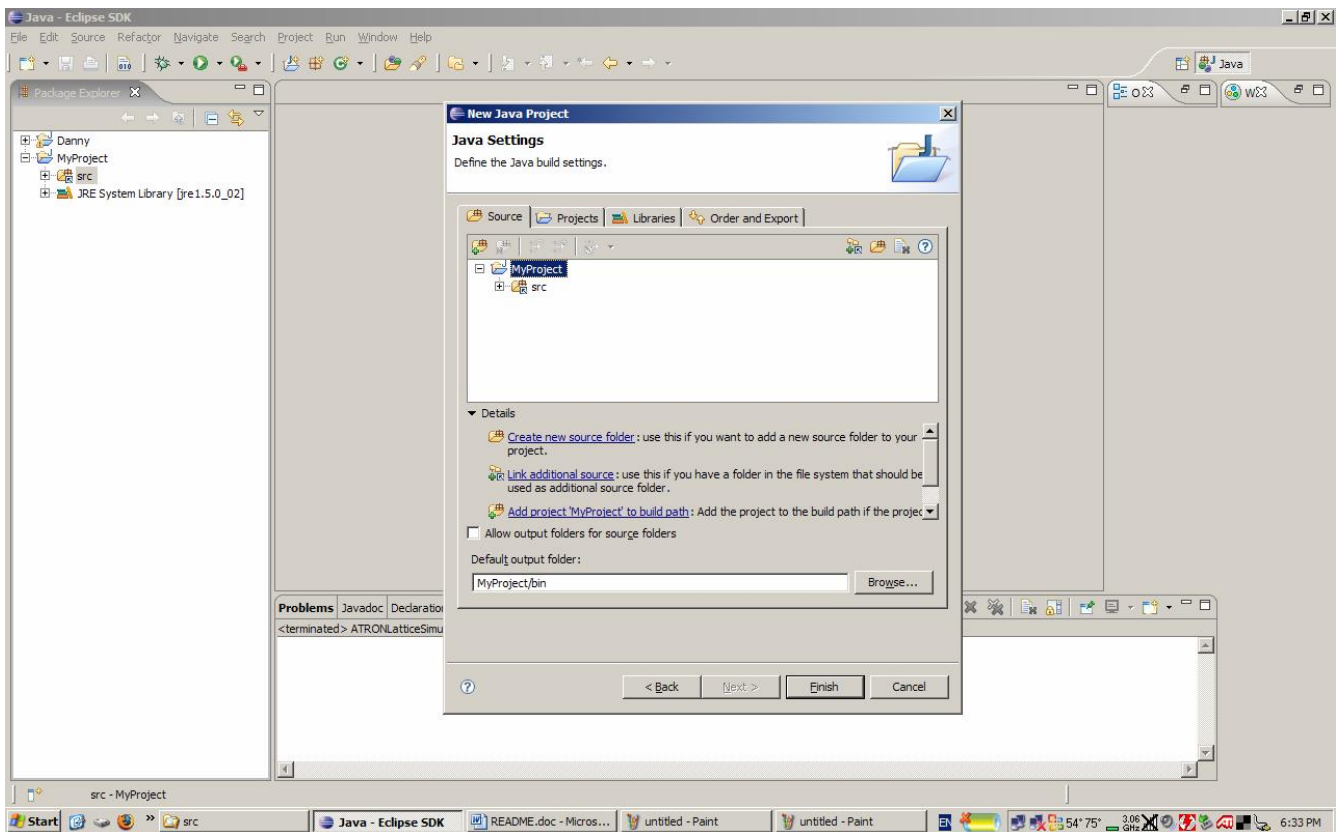


1. D:\workspace\ussr\ussr\src
2. D:\workspace\ussr\ussr\zoo\jME\src
3. D:\workspace\ussr\ussr\zoo\jmepysics\src
4. D:\workspace\ussr\ussr\zoo\jmepysics\impl\ode\src
5. D:\workspace\ussr\ussr\zoo\jmepysics\tutorial

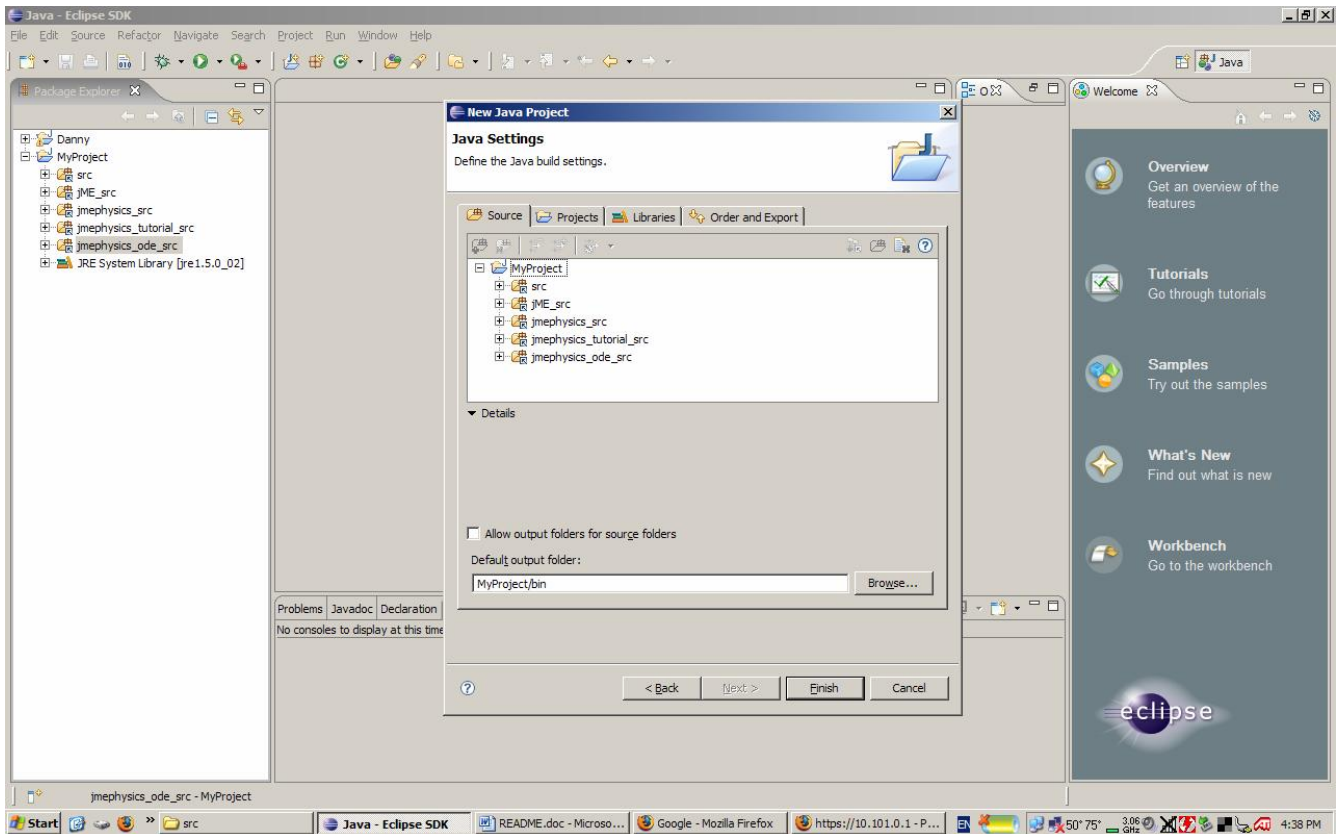
You will now see a screen like the one below, with the project called “*MyProject*” and source folder called “src”



(naturally, you can use whatever names you like). To add the remaining source directories, click on “*MyProject*” in the above screen and you will see the available actions you can perform, as shown below

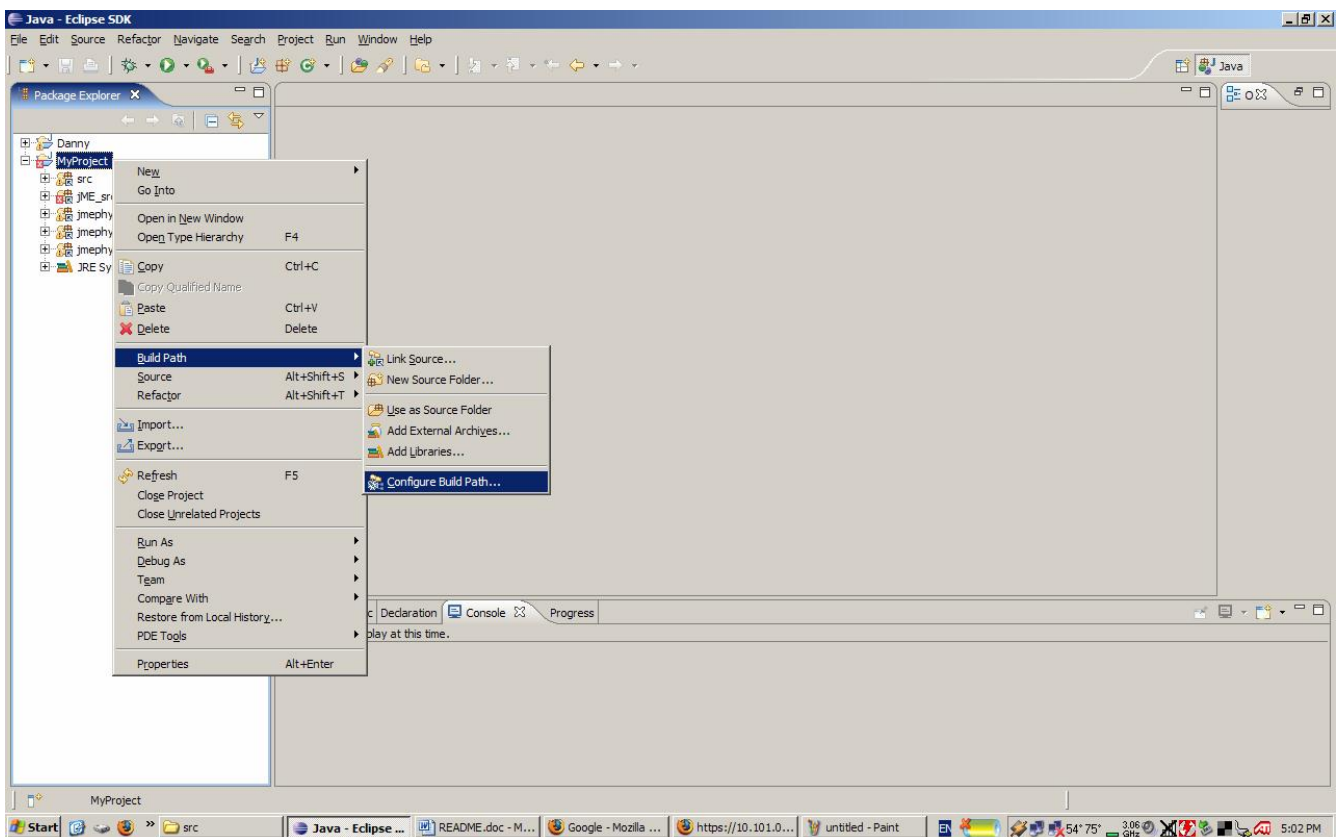


Repeat Step 5 to add the remaining source directories to the build path. After you have added all the five directories listed above, you should see something like this

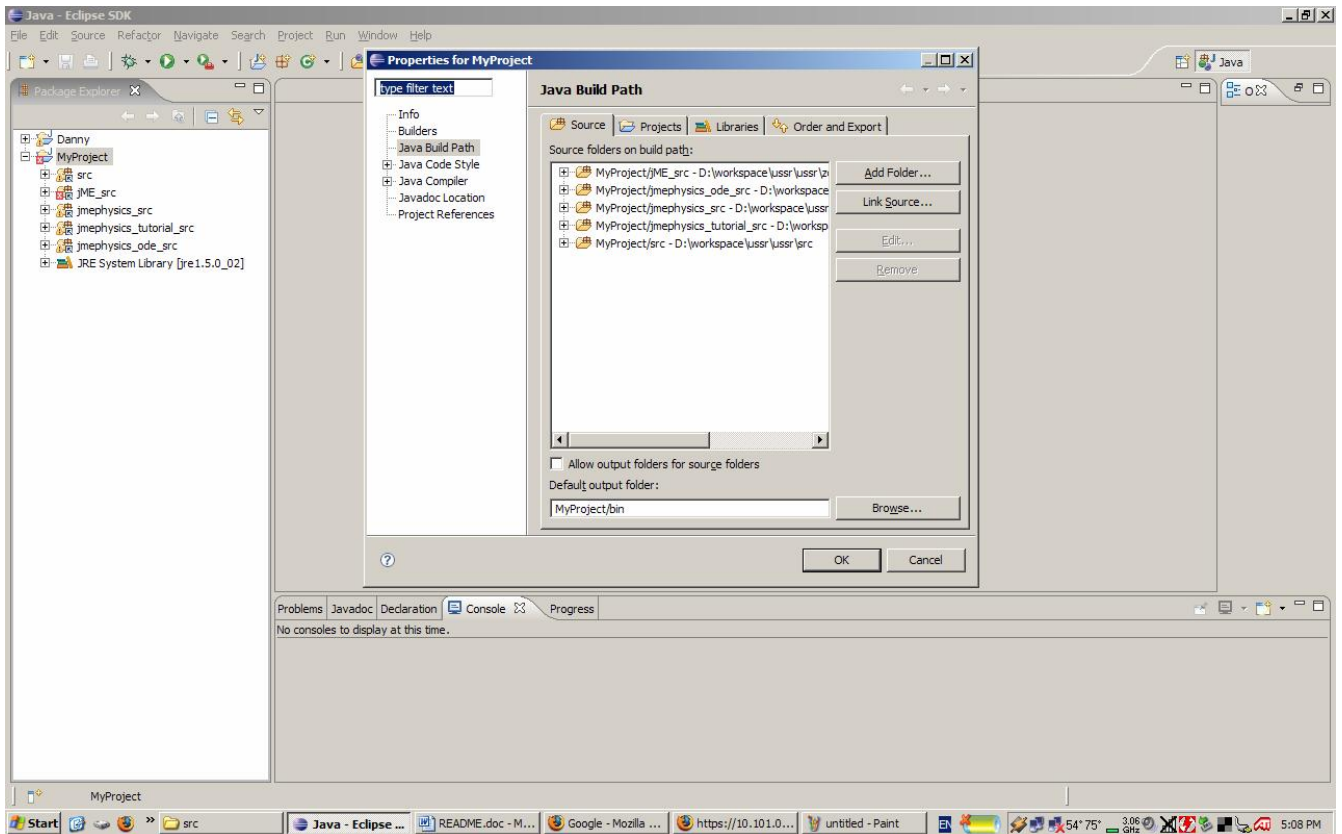


Click on “Finish” to end.

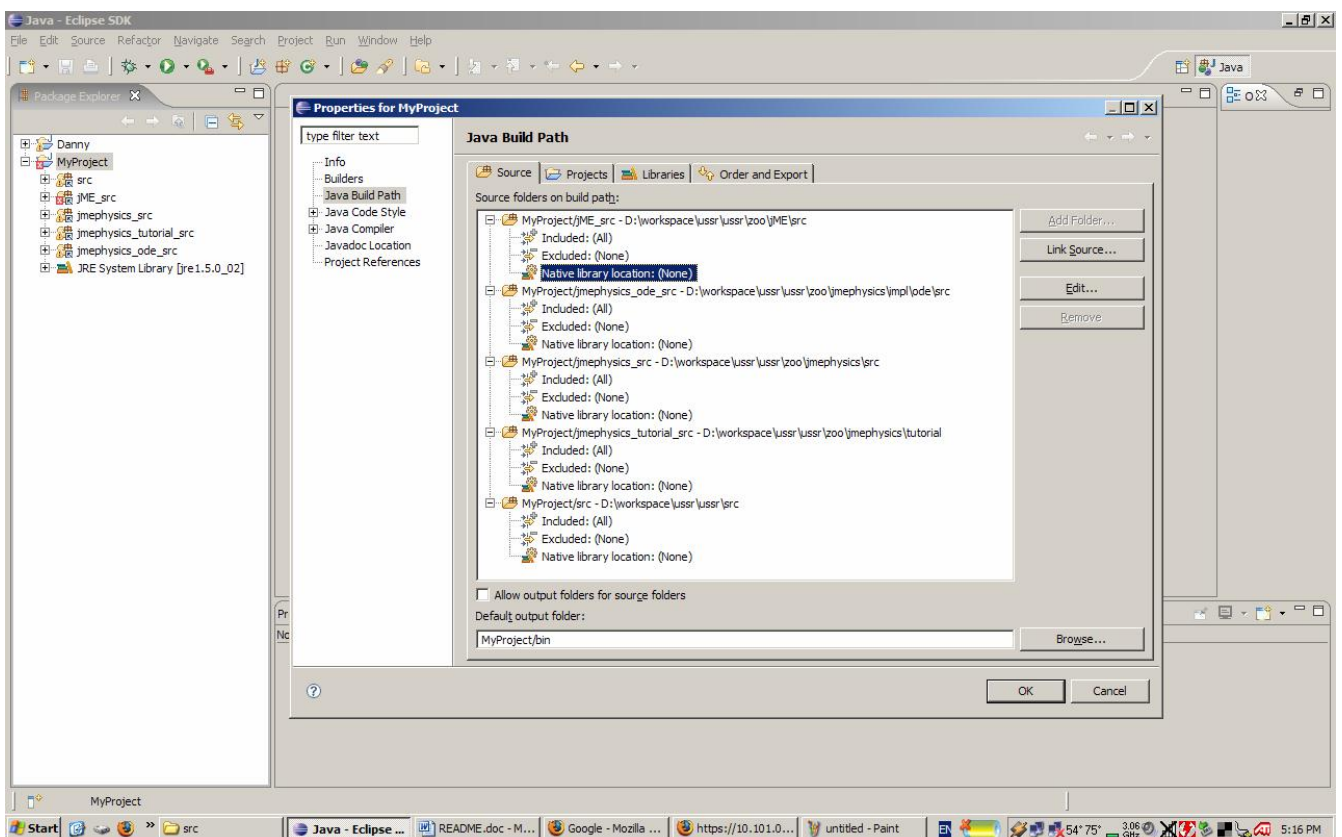
6. Right-click on the name of your project on the left and go to **Build Path à Configure Build Path...**



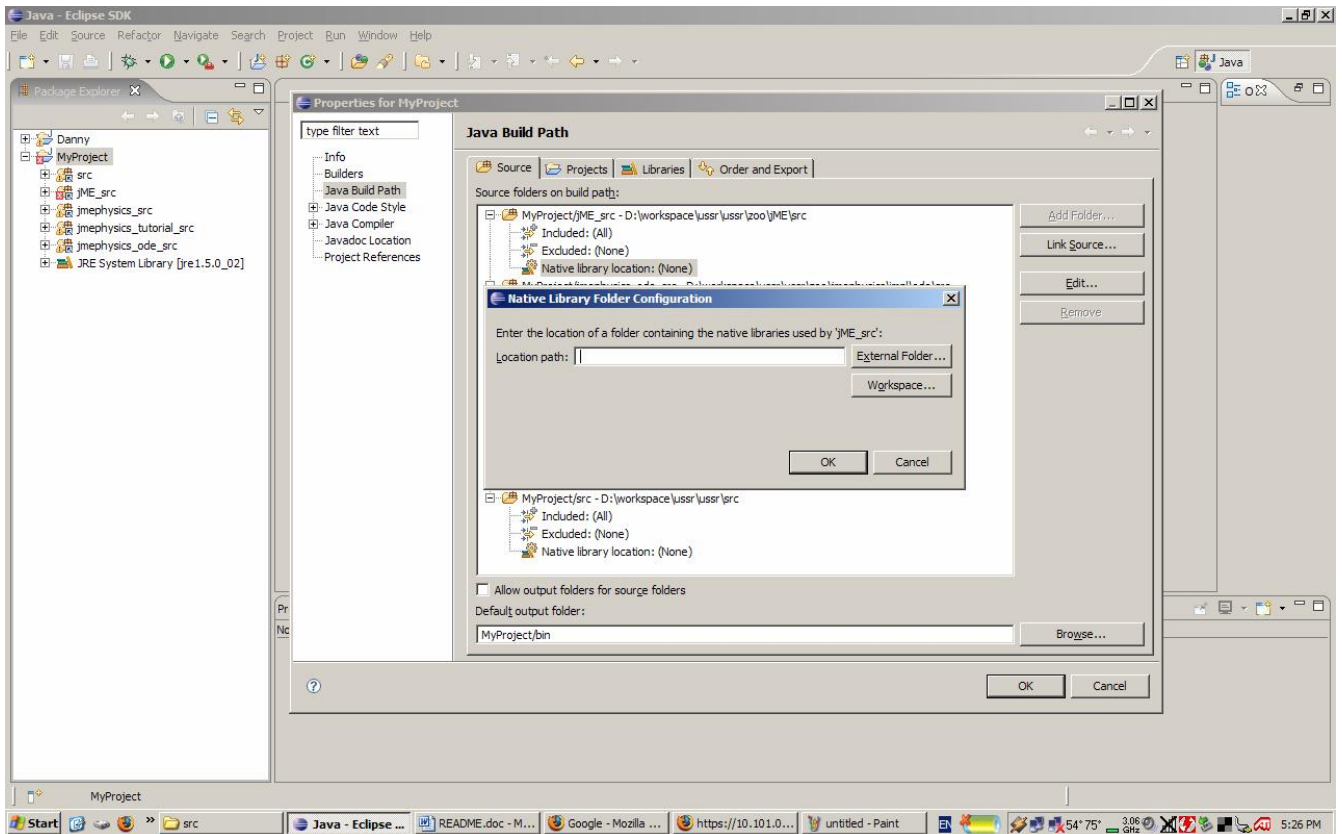
You will see the Properties window for your project as shown below



Expand all the listings to see the Inclusion and Exclusion Patterns, as well as the Native Library Locations as shown below. As you can see, there are no Native Library Locations specified, which we are going to do now.



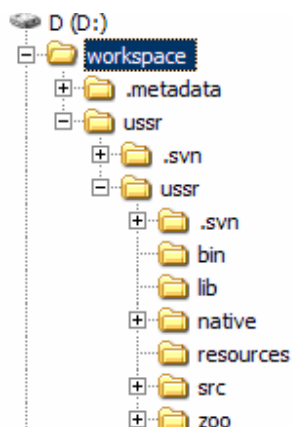
Double click on the “Native library location: (None)” highlighted in the screenshot above to open the Native Library Folder Configuration window as shown below and enter the path where the libraries are stored.



For the “ussr” project, the libraries that are used are stored in the following folders –

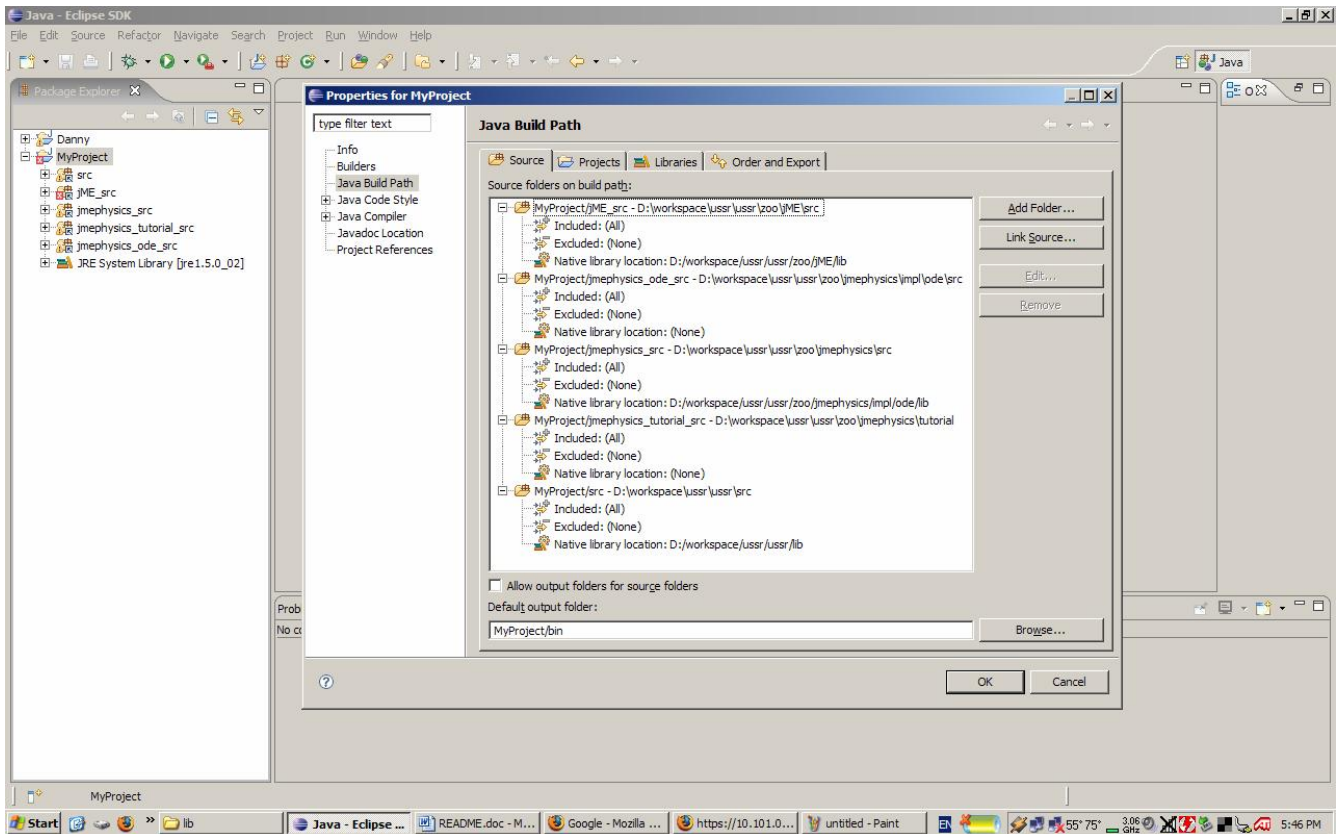
1. <LOCAL_PATH>\ussr\ussr\lib\
2. <LOCAL_PATH>\ussr\ussr\zoo\jME\lib
3. <LOCAL_PATH>\ussr\ussr\zoo\jmephsysics\impl\ode\lib

where <LOCAL_PATH> is the path on your hard drive where the workspace directory is located. For e.g., if your workspace directory is “D:\workspace”, and the directory structure for the simulator source is as shown below, then the above paths are –



1. D:\workspace\ussr\ussr\lib\
2. D:\workspace\ussr\ussr\zoo\jME\lib
3. D:\workspace\ussr\ussr\zoo\jmephsysics\impl\ode\lib

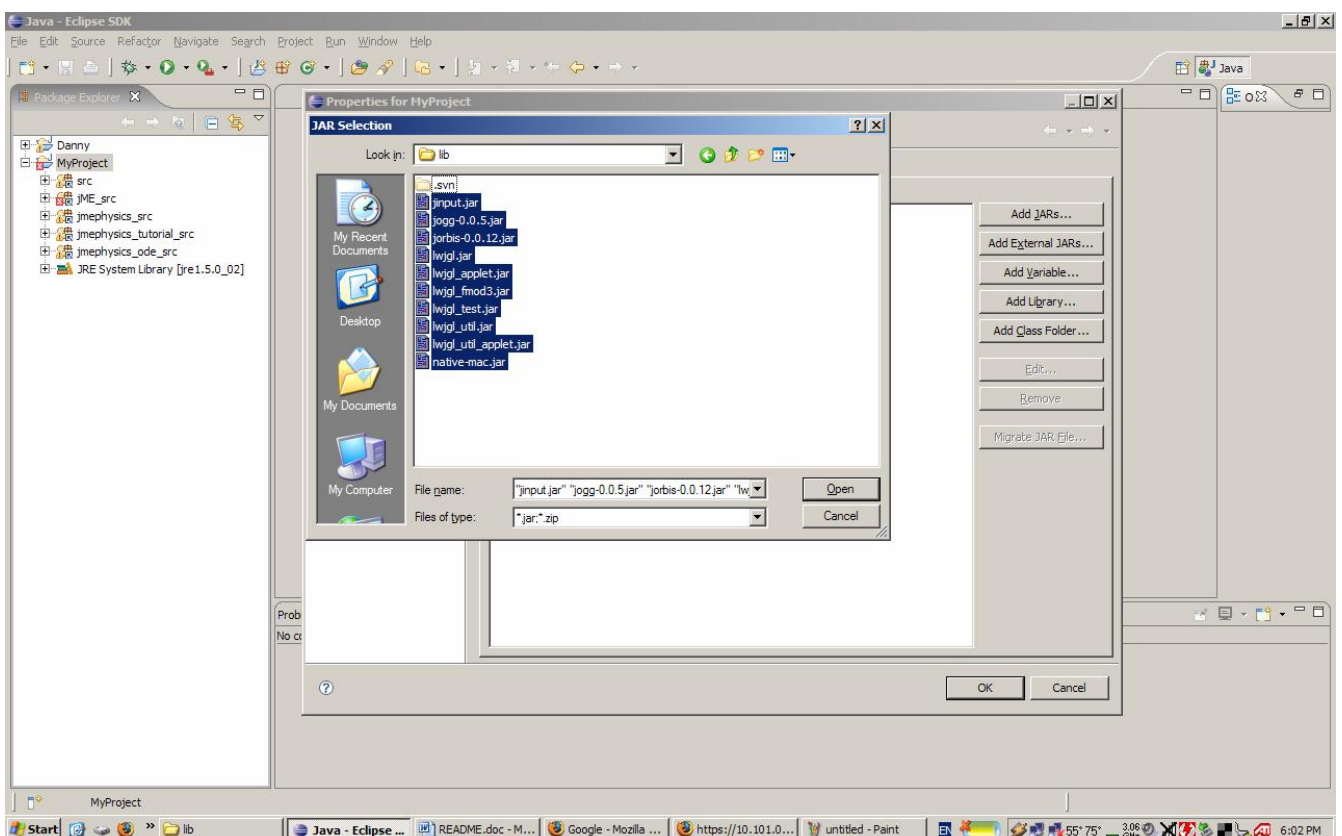
NOTE: Each path above corresponds to a specific source directory, so it is important to ensure that this correspondence is followed and the native library locations are setup exactly as shown in the screen below.



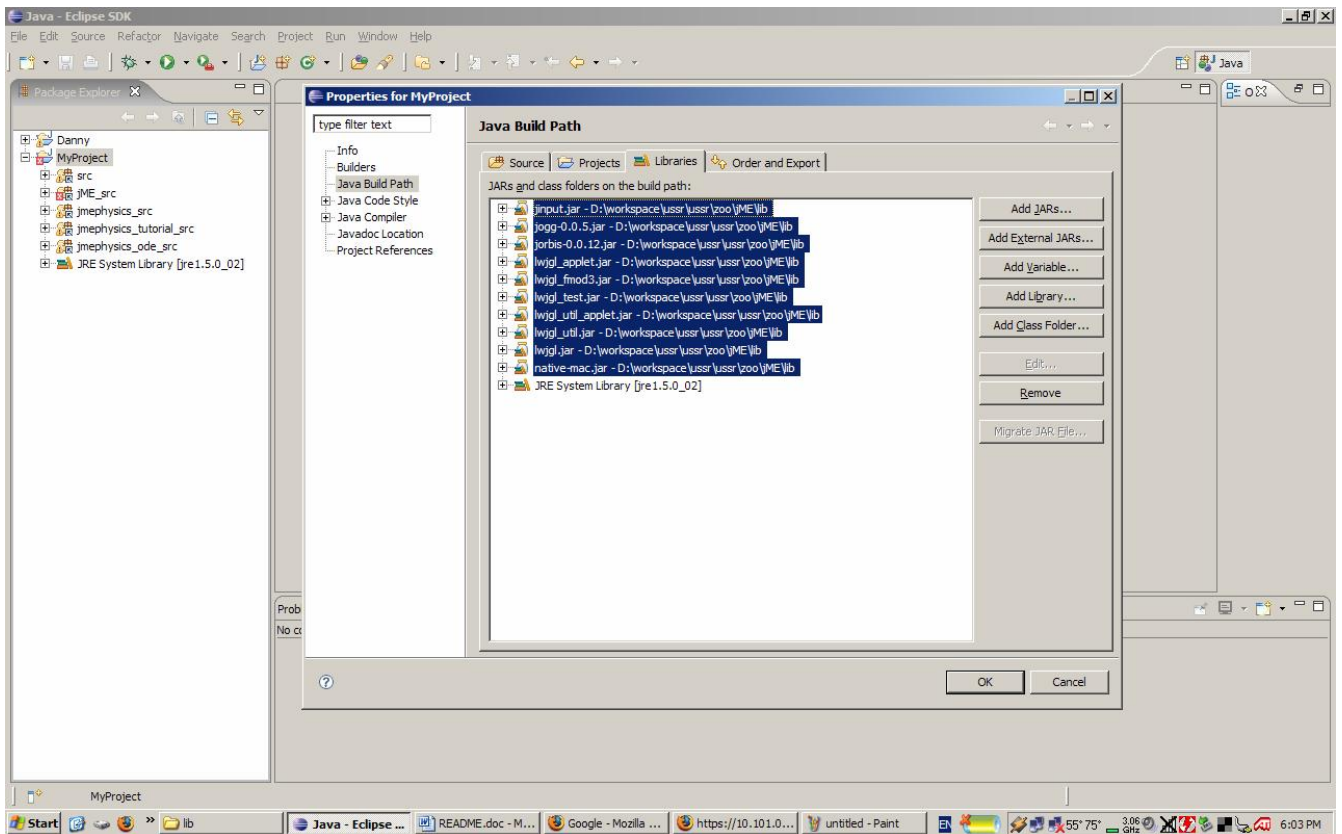
Now click on the “Libraries” tab in the same window and you will see a list of the JARs and class folders included in the build path. By default, the first item in the list is the currently installed Java Runtime Environment (JRE). To add the required libraries from the “ussr” project, click on the “Add External JARs...” button to open the JAR Selection box and select the path where the JAR files are located on your file system. The files are in the directory

<LOCAL_PATH>\ussr\ussr\zoo\jME\lib

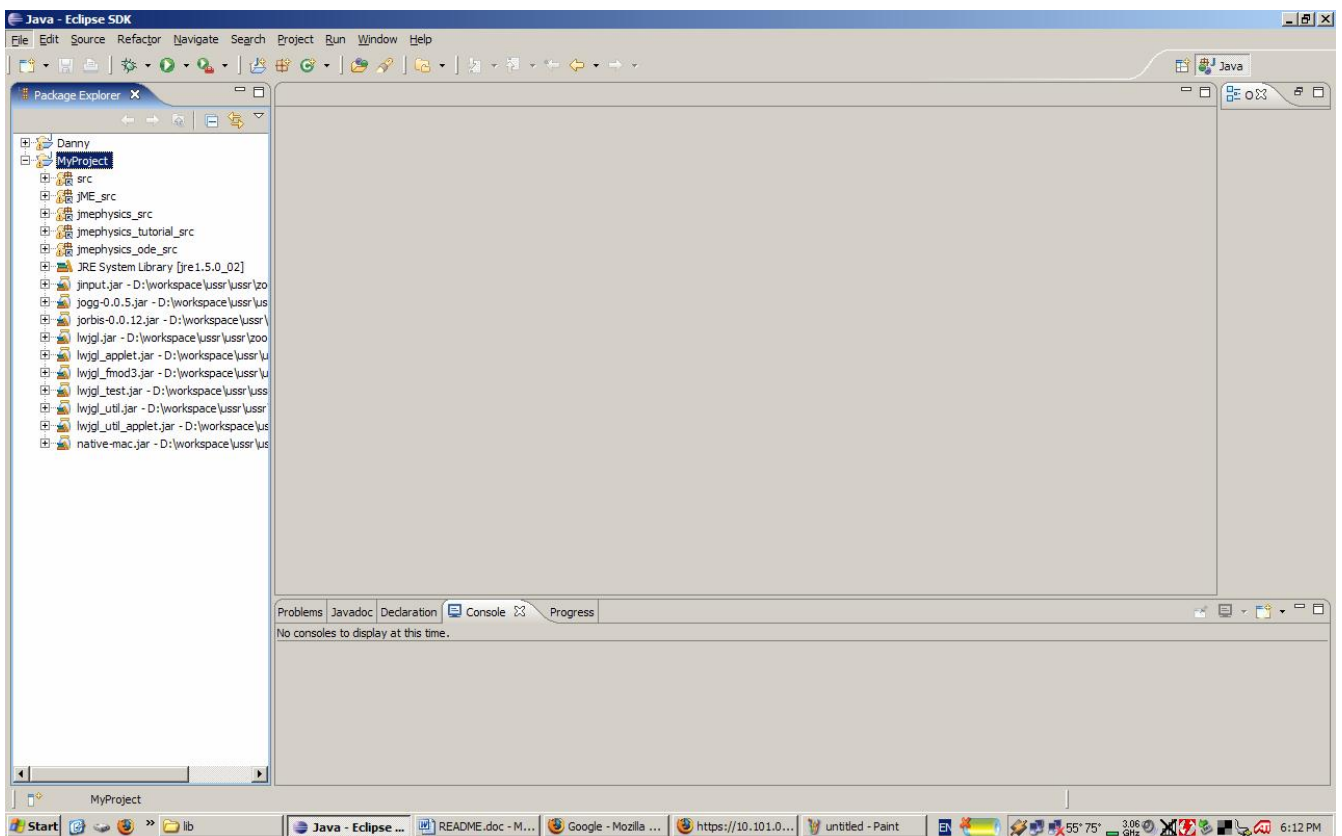
where <LOCAL_PATH> is as explained above. Select all the .jar files as below and click the “Open” button.



The JAR files will be added to the build path as shown below

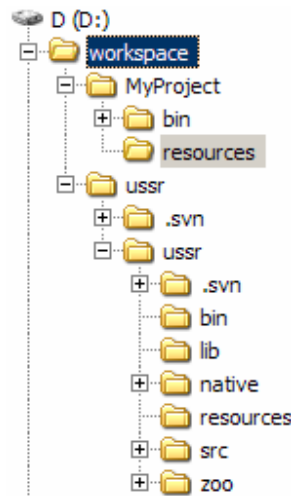


Click on the “OK” button to finish, and finally you will see the main workbench view again as shown below, with the source directories and Java libraries that are included in the project.



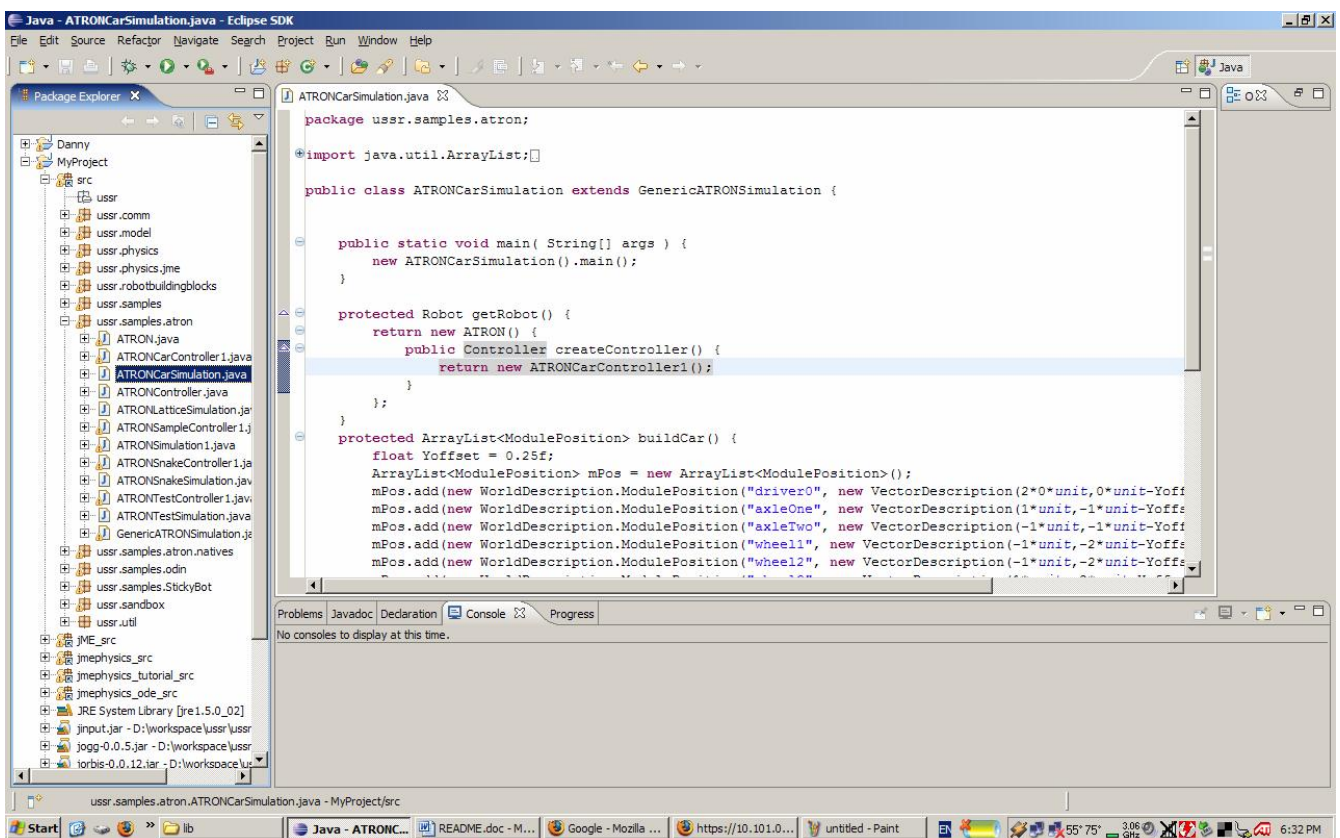
The setup of the IDE is now complete.

- Finally, copy the directory named “resources” under <LOCAL_PATH>\ussr\ussr\ to the project directory. For e.g., if the project directory is located at D:\workspace\MyProject, then copy the “resources” directory inside the MyProject directory, resulting in a directory structure like the one below

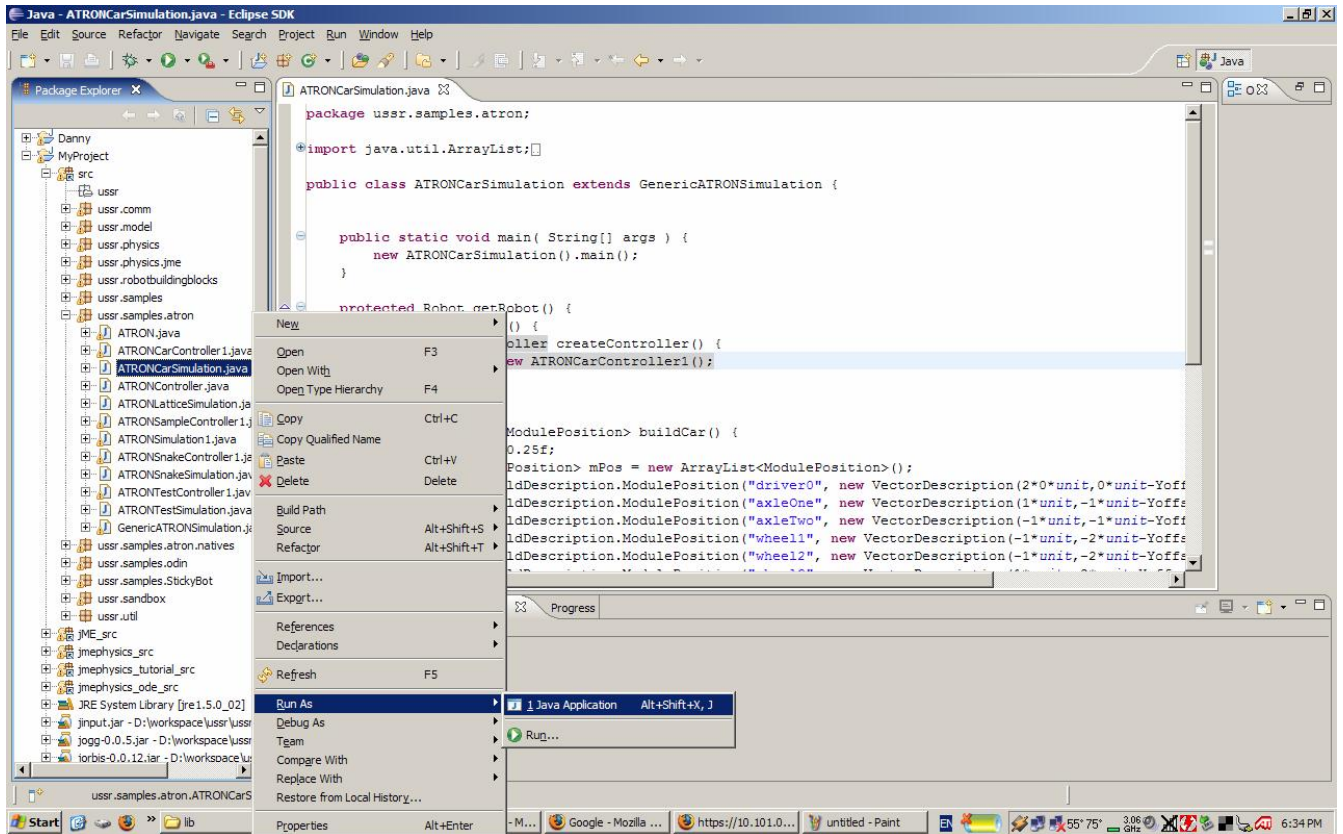


RUNNING A SIMULATION:

- Expand the source directories in the Package Explorer tab in the workbench to see the various .java source files that are included in the project.

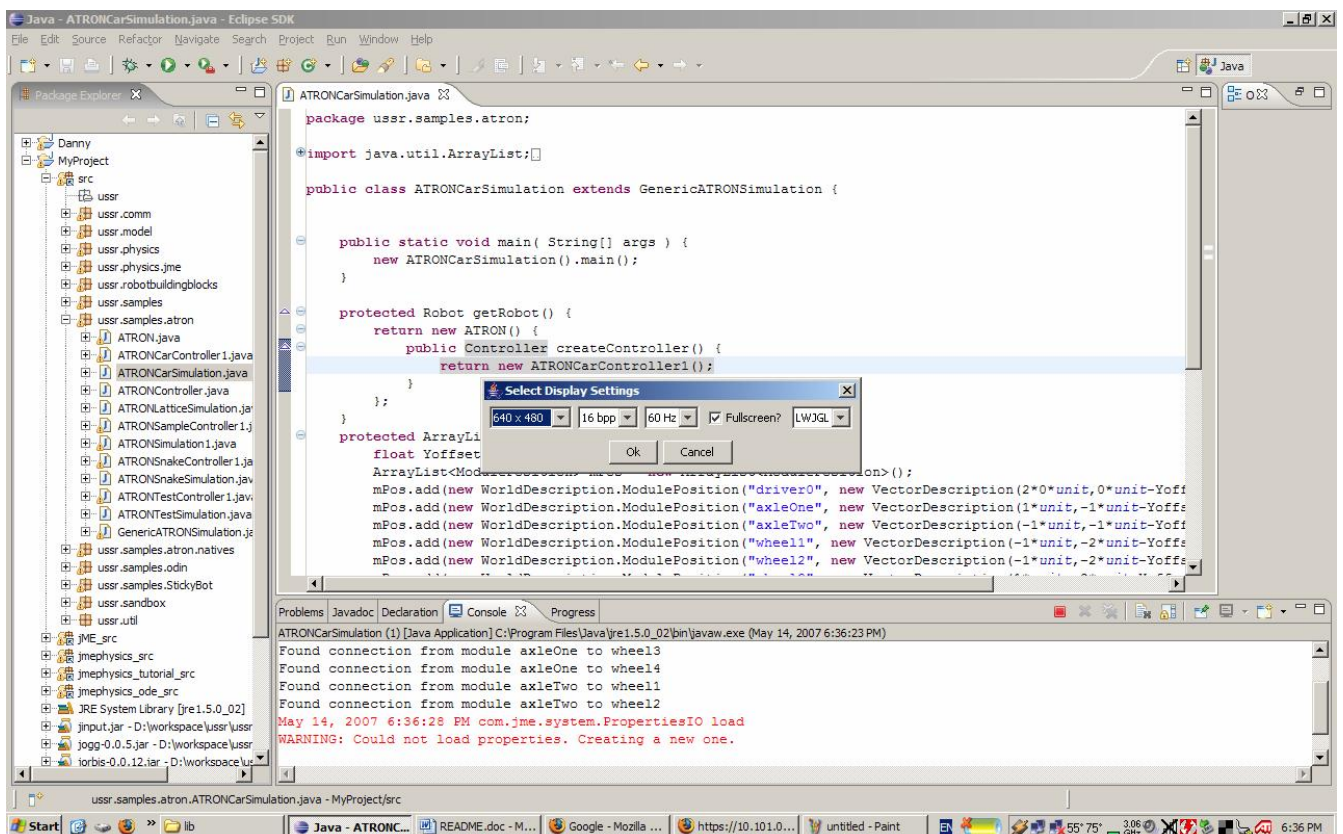


2. Right-click on a source file (*ATRONCarSimulation.java*, in this case), and go to **Run As** → **Java Application**



You will see a Java applet like the one below asking you to select display settings.

NOTE: You will only see this applet the first time you run a simulation. These settings are saved and all future simulations use the same display settings.



Select those settings that suit your hardware and click on the “OK” button. The selected simulation will now run. Below is a screenshot of the simulation.

