Getting Started with Eclipse

Introduction

This guide will help get you set up to be able to work on your homework assignments. Yay! Get a cup of coffee and work your way through it.

First, you will have to decide between the following two options:

1. Working on the computer accounts we provide.
2. Working on your own laptop.

This guide will guide you through both of these options. We will first look at how to get each option set up properly. After that, we will look at the Eclipse development environment.

Contents

Getting Everything Ready and Installed

Working With the Accounts We Provide

Working with the accounts we provide has the advantage that most things are already set up for you. To do so, either go to the *Grundausbildungspool* (GAP; the thing we have our practicals in) in the basement of *Hermann-Rodewald-Straße 3* or login to the servers using your own computer. In both cases, you need to login with the credentials you got when you signed up for studying computer science (the user name will most likely be something like *stu0000*) . To connect using your own computer, you need to download the *ThinLinc Software Client*, see "Terminalserver" on this site. Once you are logged in, you can find a development environment called *Eclipse* through the start menu.

Whatever way you choose: to get ready to work on your homework assignments, you do have to download the ACM Java library. Click this link and save the file somewhere you'll be able to find it again.

Working on Your Own Computer

To be able to work on your own computer, you need to make sure that you have three things installed:

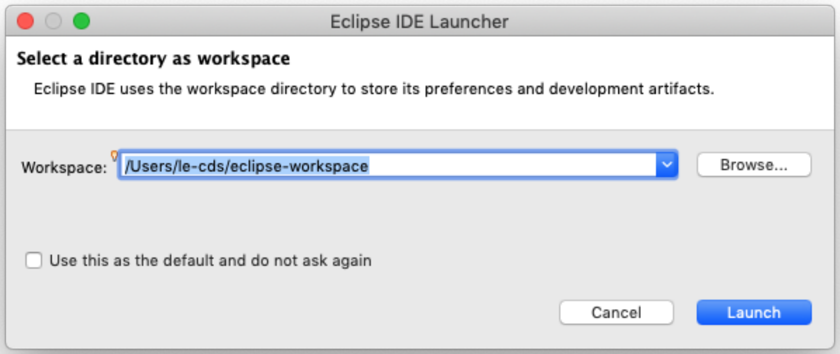
- The Java Development Kit. If you're running Linux, you can probably simply install a Java package (usually called *OpenJDK*) from your package manager. If you're running Windows or Mac OS, go to this site, accept the license and download the distribution for your operating system.
- The Eclipse development environment. Simply follow this tutorial to install the *Eclipse IDE for Java Developers*.
- The ACM Java library most of our assignments use. Click this link and save the file somewhere you'll be able to find it again.

Working With Eclipse

This section will help you get to grips with the Eclipse development environment. We'll start with a small tour around Eclipse, and finish by walking through all the steps necessary to actually write and execute your first Java program.

A Tour Through Eclipse

When you start Eclipse for the first time, you'll see something like the following dialogue that asks you for where you want your *workspace* to be saved:


Eclipse IDE Launcher

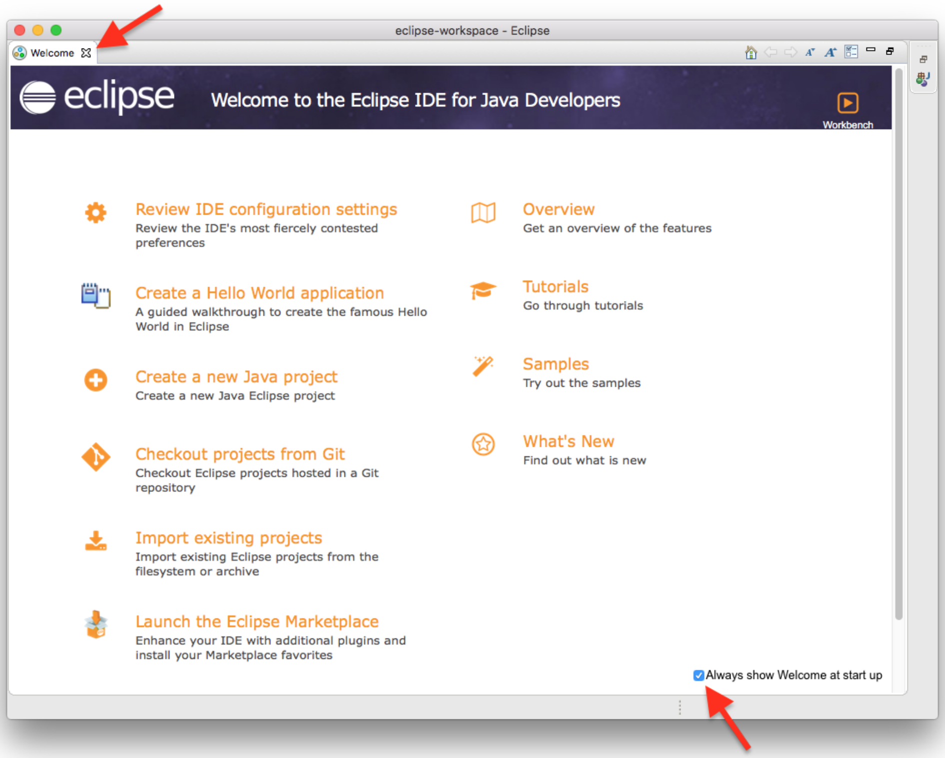
Select a directory as workspace

Eclipse IDE uses the workspace directory to store its preferences and development artifacts.

Workspace: /Users/le-cds/eclipse-workspace

[ ] Use this as the default and do not ask again

The workspace is where you will be saving all your homework. If you haven't worked with Eclipse before, just click OK and thereby accept the default location. Eclipse then loads and greets you with a nice welcome screen. Feel free to switch off the "Always show Welcome at start up" option at the bottom and dismiss the screen by clicking the X at the top.


eclipse-workspace - Eclipse

Welcome to the Eclipse IDE for Java Developers

Review IDE configuration settings
Review the IDE's most fiercely contested preferences

Create a Hello World application
A guided walkthrough to create the famous Hello World in Eclipse

Create a new Java project
Create a new Java Eclipse project

Checkout projects from Git
Checkout Eclipse projects hosted in a Git repository

Import existing projects
Import existing Eclipse projects from the filesystem or archive

Launch the Eclipse Marketplace
Enhance your IDE with additional plugins and install your Marketplace favorites

Overview
Get an overview of the features

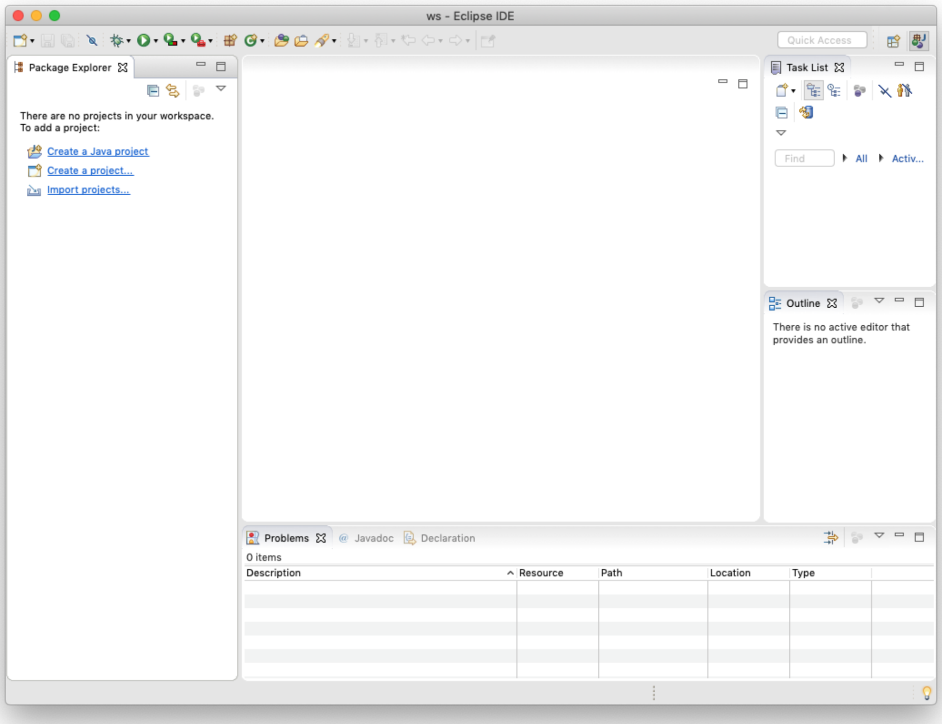
Tutorials
Go through tutorials

Samples
Try out the samples

What's New
Find out what is new

[✓] Always show Welcome at start up

What you see next is the actual Eclipse development environment that you'll be spending most of your time in:



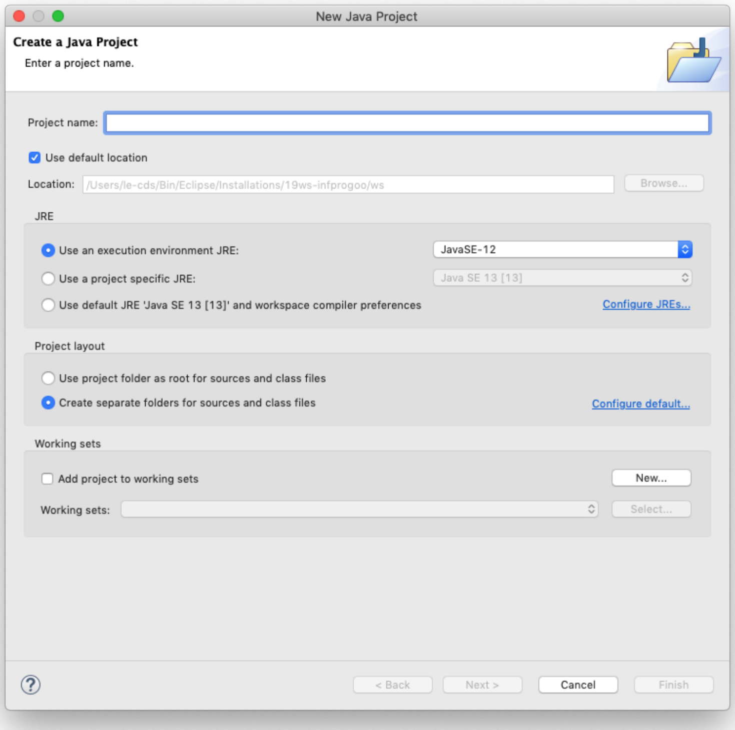
There are no projects in your workspace.
To add a project:

There is no active editor that provides an outline.

The window is divided into different areas. Most of them contain *views*, such as the *Package Explorer* to the left. The big empty area at the centre of the screen will house the Java source code editor, a text editor to write Java code with. You can drag views around, and close them as you wish. For example, you won't need the *Task List* during our lecture, so close it now. If you want to reopen a view you have closed, you can find a list of all available views through the menu by clicking *Window Show View Other*.

Writing and Executing Java Programs

To solve your homework assignments, you will need to know how to create new Java projects, add classes to them, and how to execute them. Let's start by creating a new project. Click the *File New Java Project*. This will open the following dialogue:


New Java Project

Create a Java Project

Enter a project name.

Project name:

☑ Use default location

Location: /Users/le-cds/Bin/Eclipse/Installations/19ws-infprogoo/ws

JRE

● Use an execution environment JRE: JavaSE-12

○ Use a project specific JRE: Java SE 13 [13]

○ Use default JRE 'Java SE 13 [13]' and workspace compiler preferences

Project layout

○ Use project folder as root for sources and class files

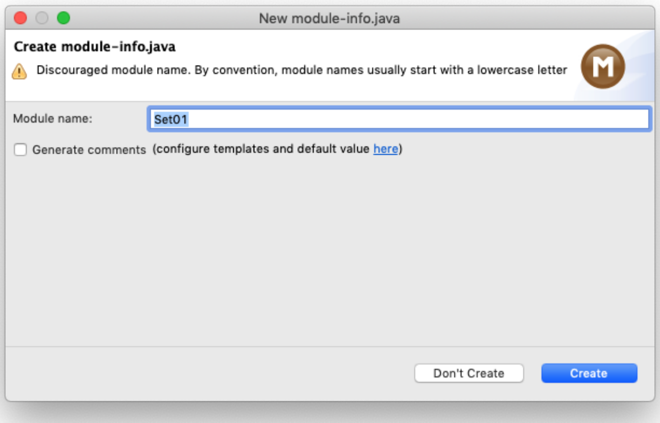
● Create separate folders for sources and class files

Working sets

☐ Add project to working sets

Working sets:

Enter a project name that describes the project. For your homework assignments, for example, you may want to create a separate project for each set of assignments, so a project name like "Set01" might work well for the first set. Leave the rest untouched and click *Finish*. You will probably see the following dialogue:


New module-info.java

Create module-info.java

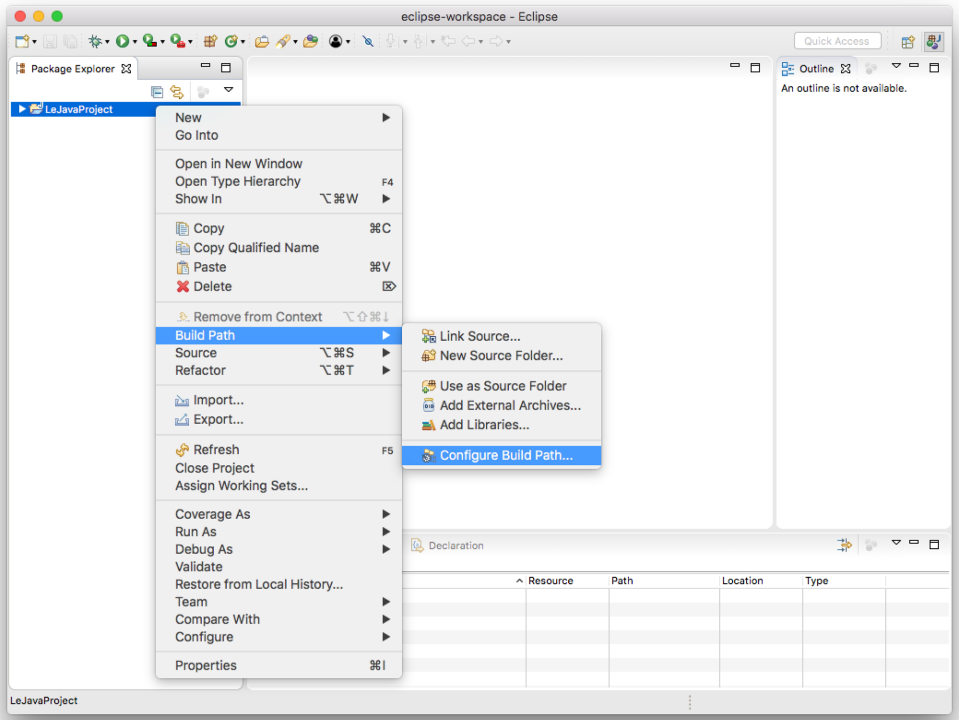
Discouraged module name. By convention, module names usually start with a lowercase letter

Module name: Set01

☐ Generate comments (configure templates and default value here)

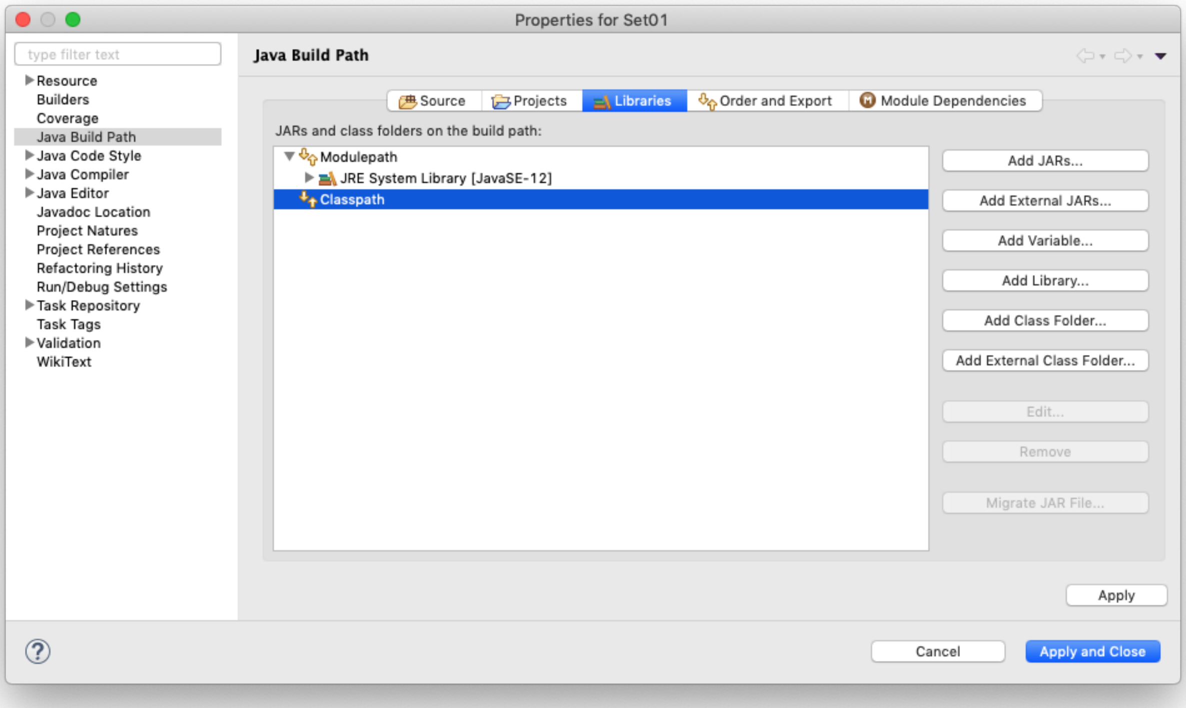
If that is the case, click the *Don't Create* button (things won't work otherwise).

Your Eclipse workspace will now contain an entry for the new project. Eclipse has to be told that you want to use the ACM library with that project. To configure it that way, right-click on the project, click on *Build Path* and select *Configure Build Path...*:



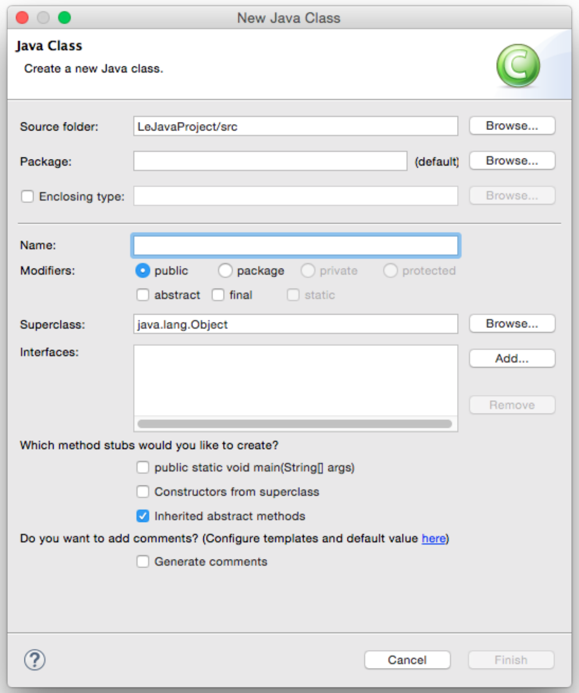
An outline is not available.

Remember the ACM library you downloaded? This is where we need it. Since you will be making use of that library, we need to configure the project such that it knows that the library exists. To that end, switch to the *Libraries* tab and select the *Classpath* entry (If there is no such entry, don't worry about it…):



A library in Java is distributed as a file with a `.jar` file extension. Click on the *Add External JARs* button and select the downloaded ACM library (if you don't remember where you saved it, simply download the library again). Once you have found the library, it should show up in the dialogue. Click *Apply and Close* to dismiss the build path configuration and you're all set!

You are now ready to add your first class to your newly configured project. Right-click your new project in the *Package Explorer* and select *New Class*:



New Java Class

Java Class

Create a new Java class.

Source folder: LeJavaProject/src [Browse...]

Package: (default) [Browse...]

☐ Enclosing type: [Browse...]

Name:

Modifiers: ● public ○ package ○ private ○ protected

☐ abstract ☐ final ☐ static

Superclass: java.lang.Object [Browse...]

Interfaces: [Add...] [Remove]

Which method stubs would you like to create?

☐ public static void main(String[] args)

☐ Constructors from superclass

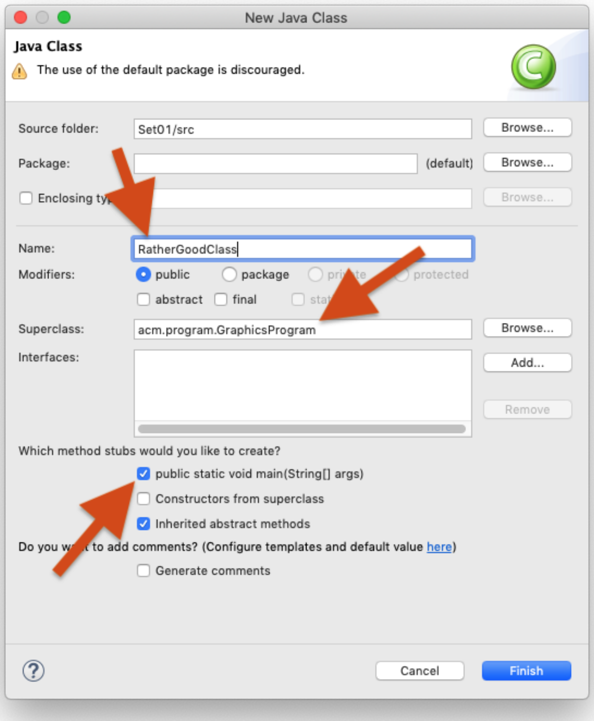
☑ Inherited abstract methods

Do you want to add comments? (Configure templates and default value here)

☐ Generate comments

[Cancel] [Finish]

Give your class a proper name. The dialogue will tell you if your class name is valid or not. For the first few programming exercises, you want your class to extend a superclass, such as `GraphicsProgram` (to choose a superclass, click the corresponding *Browse* button). Also, be sure to click the strange box labelled `public static void main(String[] args)`. The result may look something like this:



New Java Class

Java Class

The use of the default package is discouraged.

Source folder: Set01/src [Browse...]

Package: (default) [Browse...]

☐ Enclosing type: [Browse...]

Name: RatherGoodClass

Modifiers: ● public ○ package ○ private ○ protected

☐ abstract ☐ final ☐ static

Superclass: acm.program.GraphicsProgram [Browse...]

Interfaces: [Add...] [Remove]

Which method stubs would you like to create?

☑ public static void main(String[] args)

☐ Constructors from superclass

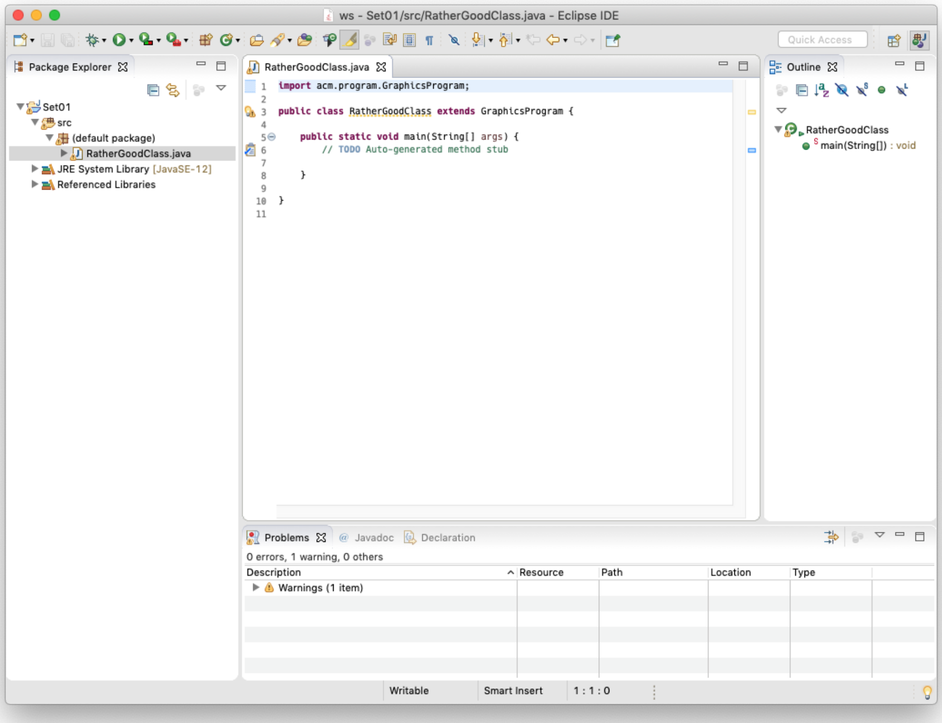
☑ Inherited abstract methods

Do you want to add comments? (Configure templates and default value here)

☐ Generate comments

[Cancel] [Finish]

Note that the dialogue still gives us a warning because we have left the package name empty. You can safely ignore that warning for the moment. There will come a time when you will actually use packages, but now is not that time. Instead, click *Finish*. Eclipse will create the class for you and open it in an editor for you to start writing code:



```java
import acm.program.GraphicsProgram;

public class RatherGoodClass extends GraphicsProgram {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

    }

}
```

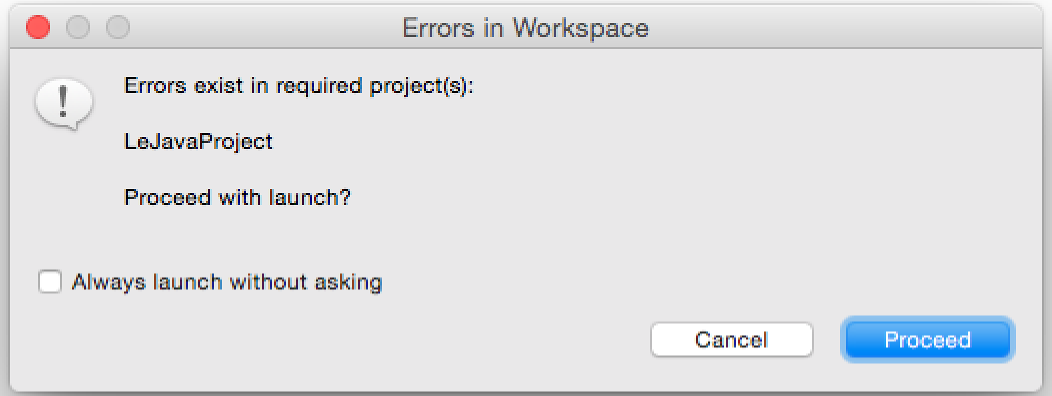
```
0 errors, 1 warning, 0 others
Description                     Resource    Path    Location    Type
▶ Warnings (1 item)
```

Let's say you have actually written a bit of code and want to see if it works. To do so, you will need to replace `// TODO Auto-generated method stub` with the following code:

```java
new RatherGoodClass().start();
```

Of course, the class name (here `RatherGoodClass`) has to be replaced with the name you chose for your class.

Now you're ready to run your program. Right-click your class in the *Package Explorer* and select *Run As Java Application*. If everything is fine, a window should pop up and your program should be executing. If instead Java cannot execute your program because of errors in your source code, Eclipse will tell you so:



Errors exist in required project(s):

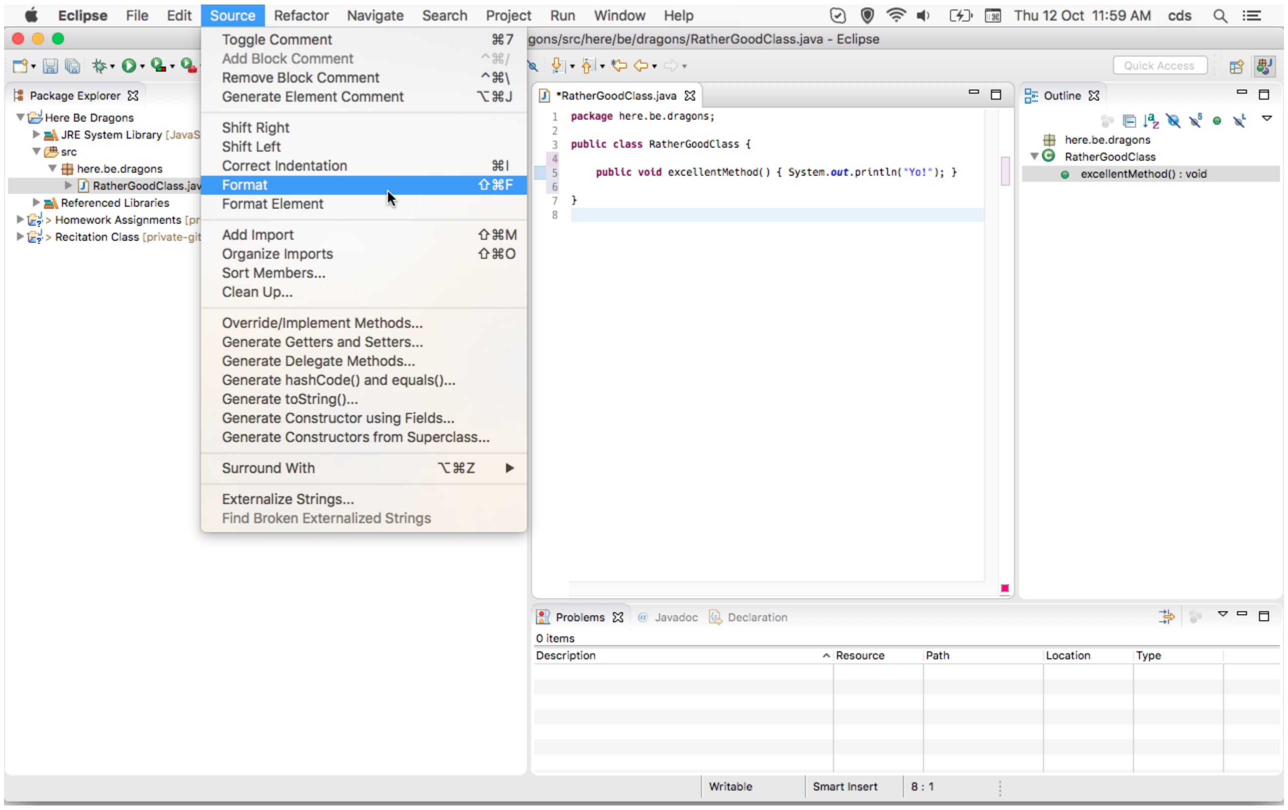
LeJavaProject

Proceed with launch?

In that case, hit *Cancel* and go hunt that error down. Remember the *Problems* view at the bottom of the Eclipse window? That's actually quite helpful for hunting down errors: it lists every error Eclipse was able to find. Double-clicking the error will jump to the offending part of the source code so you can fix it.

Formatting Source Code

The automatic tests we run on the source code you submit won't let you hand in badly formatted code. This is because we want to force you to write code that is properly readable. Fortunately, formatting your code properly is a matter of two clicks of a mouse button:



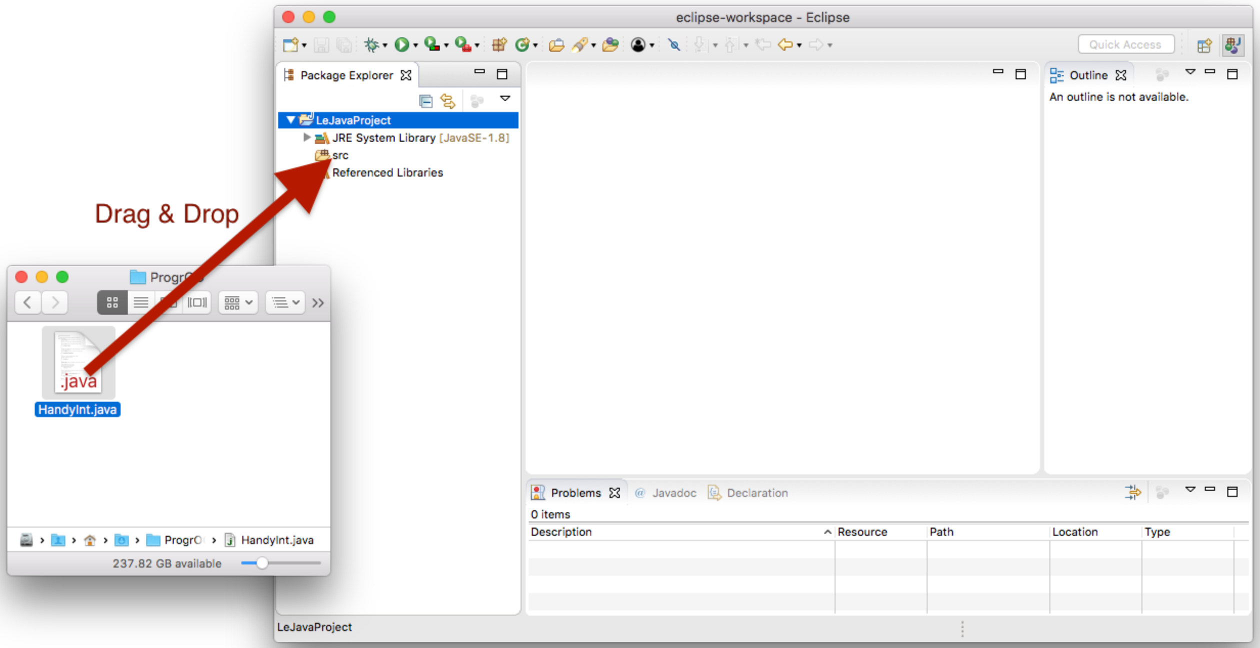
```
package here.be.dragons;

public class RatherGoodClass {

    public void excellentMethod() { System.out.println("Yo!"); }

}
```

Importing Classes

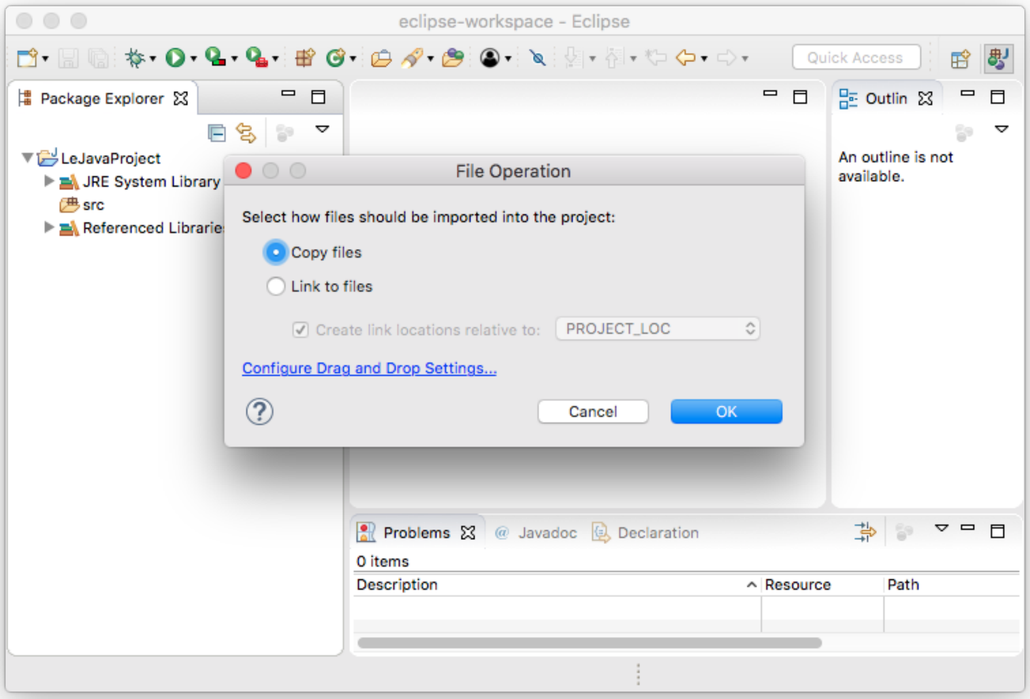
There will be assignments where we ask you to import existing classes into your workspace. There are (at least) two ways to do so:

1. Right-click the destination folder in your Eclipse project and choose *Import...*.
2. Use drag & drop.

We will now describe the latter. Start by downloading the respective class. Then, import it into your Java project by dragging and dropping it from your file explorer to your source folder, like this:



Eclipse will ask you whether you want to copy the file into your project or just link to it. You want the former:


File Operation

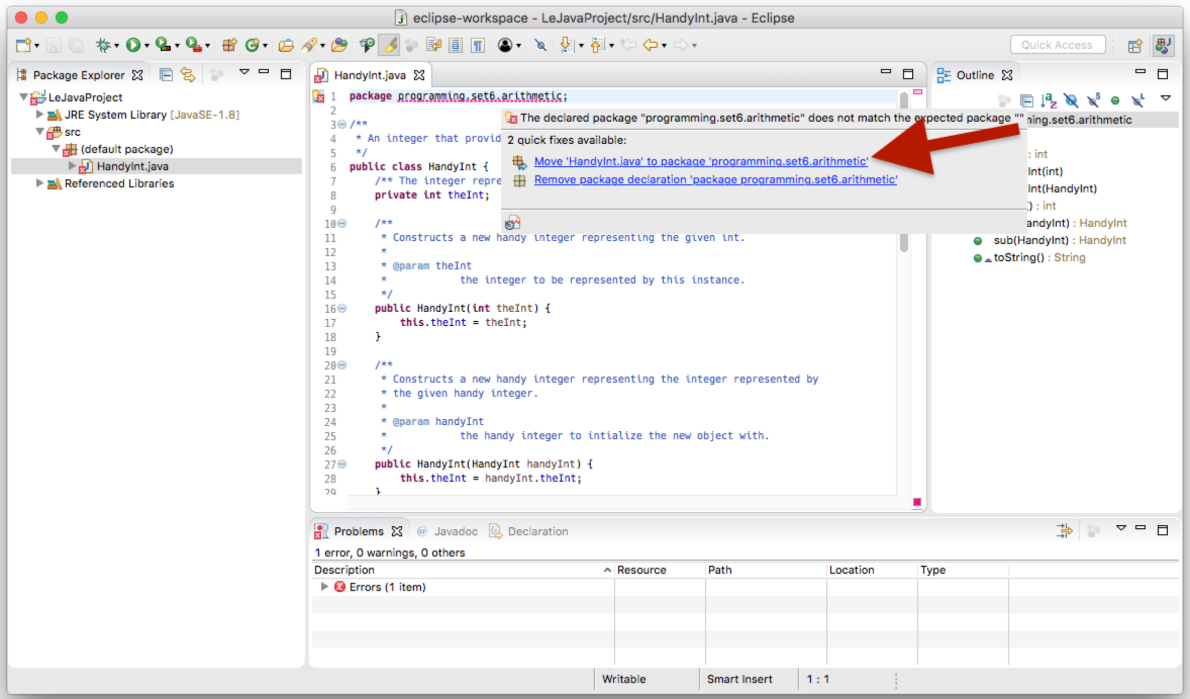
Select how files should be imported into the project:

[✓ Copy files]

Link to files

Create link locations relative to: PROJECT_LOC

The imported file may declare to be in a different package than the one you imported it to, resulting in a compiler error. To fix that, simply open up the file, point the mouse cursor at the wrong package declaration, and choose to move the file to that package.



```
package programming.set6.arithmetic;

/**
 * An integer that provid
 */
public class HandyInt {
    /** The integer repre
    private int theInt;

    /**
     * Constructs a new handy integer representing the given int.
     *
     * @param theInt
     *            the integer to be represented by this instance.
     */
    public HandyInt(int theInt) {
        this.theInt = theInt;
    }

    /**
     * Constructs a new handy integer representing the integer represented by
     * the given handy integer.
     *
     * @param handyInt
     *            the handy integer to intialize the new object with.
     */
    public HandyInt(HandyInt handyInt) {
        this.theInt = handyInt.theInt;
    }
```

The declared package "programming.set6.arithmetic" does not match the expected package ""

2 quick fixes available:

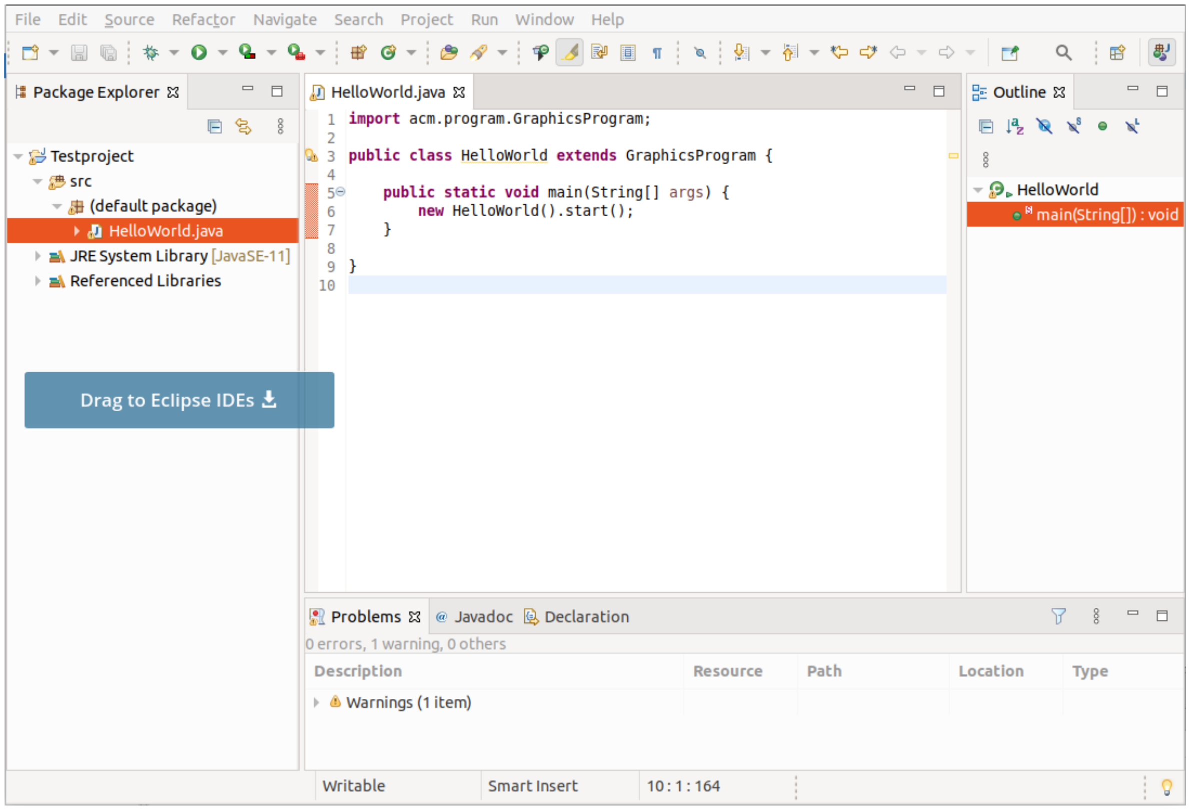
- Move 'HandyInt.java' to package 'programming.set6.arithmetic'
- Remove package declaration 'package programming.set6.arithmetic'

1 error, 0 warnings, 0 others

Description	Resource	Path	Location	Type
Errors (1 item)				

Allow Us to View Your Code

During the exercises, the instructors and assistants want to help you code and assist you if you run into problems that you cannot solve yourself. For this reason, we may want to have a look at your code to support you. As this is a little more difficult in an online teaching scenario and talking about your code while screensharing might limit us, we use CodeTogether as a code collaboration tool to help you. To install this in your Eclipse, visit this website and drag and drop the *Drag to Eclipse IDE* button directly into Eclipse. Make sure to drop it directly into the *Package Explorer*, as this dropping the link into the editor view does not start the installation process.

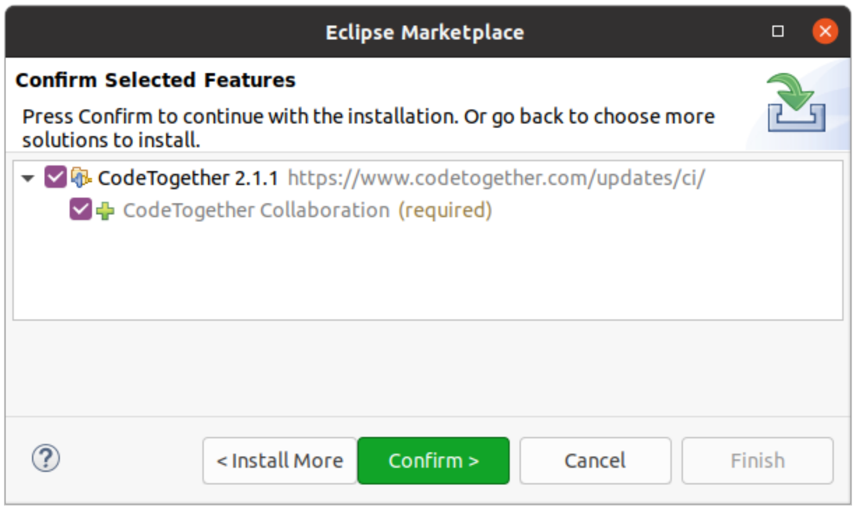


```
import acm.program.GraphicsProgram;

public class HelloWorld extends GraphicsProgram {

    public static void main(String[] args) {
        new HelloWorld().start();
    }

}
```

0 errors, 1 warning, 0 others

Description	Resource	Path	Location	Type
Warnings (1 item)				

This opens a dialog to install CodeTogether using the Eclipse Marketplace. Click *Confirm* > and accept the licence agreement and *Finish* the dialog. Eclipse will promt you to restart to apply the software update, confirm that by clicking *Restart Now*.

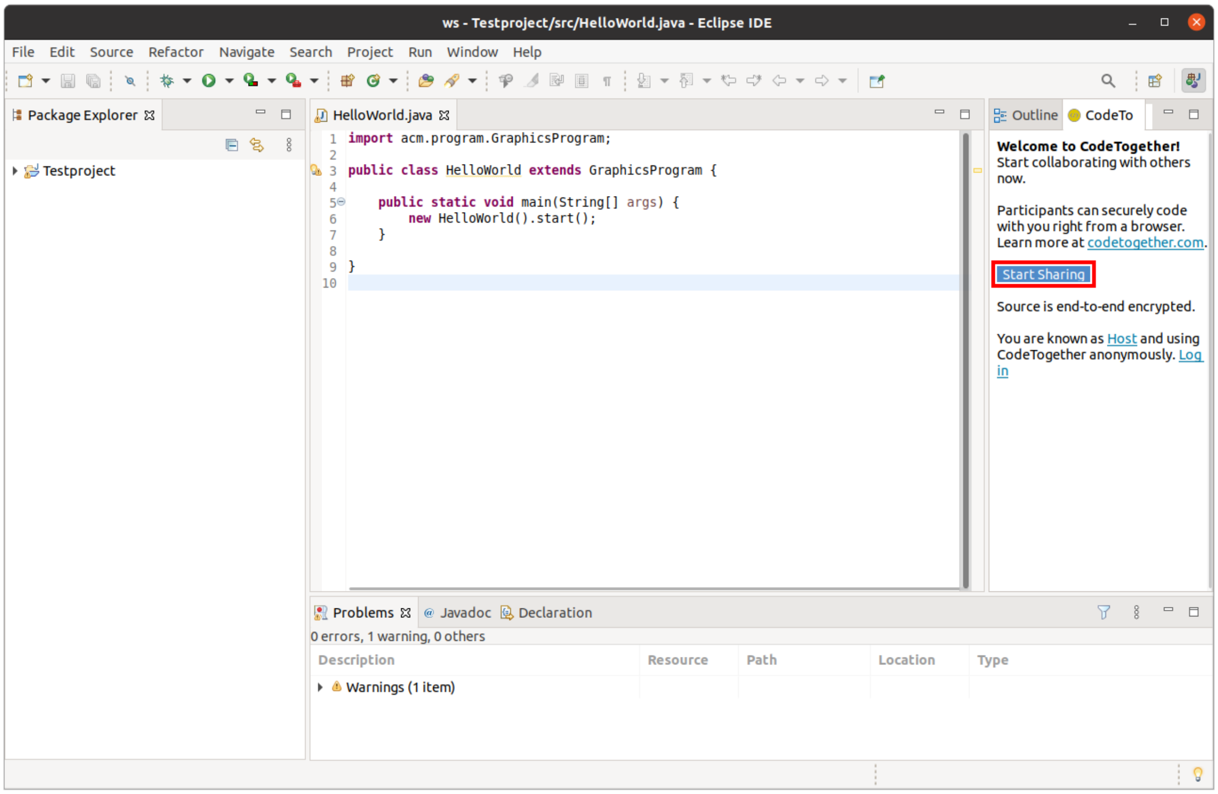


Confirm Selected Features

Press Confirm to continue with the installation. Or go back to choose more solutions to install.

- [✓] CodeTogether 2.1.1 https://www.codetogether.com/updates/ci/
  - [✓] CodeTogether Collaboration (required)

Now a new view of *CodeTogether* will open. To share your code with us, click on the blue *Start Sharing* button, copy the invite URL and share it with your instructor when they want to have a look at your code.


ws - Testproject/src/HelloWorld.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
Testproject
HelloWorld.java
Outline
CodeTo
Problems
Javadoc
Declaration

```java
import acm.program.GraphicsProgram;

public class HelloWorld extends GraphicsProgram {

    public static void main(String[] args) {
        new HelloWorld().start();
    }

}
```

Welcome to CodeTogether!
Start collaborating with others now.

Participants can securely code with you right from a browser. Learn more at codetogether.com.

Start Sharing

Source is end-to-end encrypted.

You are known as Host and using CodeTogether anonymously. Log in

0 errors, 1 warning, 0 others

Description	Resource	Path	Location	Type
Warnings (1 item)				