

## Installing a development environment for Java

This document will guide you through the process of installing a comfortable development environment for Java.

### *System Requirements*

- Windows® Intel® Pentium® II / 233MHz or Higher<sup>1</sup>
- 256 Mb RAM (recommended)
- ~580 Mb hard disk space (additional 120Mb for Java documentation)<sup>2</sup>
- CD-ROM drive or good internet connection (for installation)
- High resolution graphic adapter and monitor (1024x768 or higher, 256 colors)
- Mouse or other pointing device
- Microsoft® Windows 98, NT 4.0 (SP3)<sup>3</sup>, 2000 or XP, Linux/Unix or Mac OS X<sup>3</sup>

## Setting up your Java Development Environment

Setting up your Java development environment will take you through the following two main steps:

1. Installing the Java™ 2 SDK, Standard Edition, v 1.4.0 (or later)
2. Installing the JBuilder Personal programming environment:
- 3.

In the following we discuss these steps, one after another.

### *Installing the Java™ 2 SDK, Standard Edition, v 1.4.1*

This section describes the installation process of the Java™ 2 SDK (JDK), version 1.4.1.

1. Download the Java 2 SDK, v 1.4.1 software from  
<http://java.sun.com/j2se/1.4.1/download.html>, by selecting the SDK link.
  - a) Read the appearing licensing information carefully and accept it by pressing the appropriate button at the top or at the bottom of the page.
  - b) Select your choice of download from the appearing set of sources. We suggest selecting the HTTP download.
  - c) After your browser initiates the download, you have to specify the location on your hard drive where you want to store the installation package. We suggest creating a folder named **Install** on the **C:** drive of your computer and storing the package there. (In the following we'll use the assumption that you have stored the install package in this folder. In case you have decided otherwise, you will need to adapt the following description.)
  - d) It may take a few minutes while your computer downloads the package. Wait until it is ready.

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<sup>1</sup> The system described in this document runs on other processors as well, but these options are not discussed here.

<sup>2</sup> Including future hard disk requirements for RePast.

<sup>3</sup> The system described in this document is available on other operating systems as well, but these options are not discussed here.

2. Now, you have to open up the folder, where you have stored the downloaded package. To do this, double-click on the 'My Computer' icon on the top-left corner of your computer desktop (screen). In the window that popped up, double-click on the icon of drive **C:**. Continue by double-clicking on the **Install** folder.
3. Close any other application beside the window containing the downloaded file.
4. Run the downloaded file contained in the **C:\Install** folder by double-clicking on it. The preparation for running this installation program may take a while, but soon the Java™ 2 SDK, Standard Edition, v 1.4.1\_01 installation window should be up.
5. Follow the instructions of the installation program. We suggest accepting all the offered options and configurations.

### ***Installing the JBuilder programming environment***

This section describes the process of installing the JBuilder programming environment. For this, we assume that you have followed the steps in the previous section and you already have the java SDK package installed on your computer, as described in the previous sections. The particular version we describe here is JBuilder 8 Personal.

1. As a first step, you have to download the JBuilder 8 Personal programming environment from <http://www.borland.com/jbuilder/personal/index.html>.
2. Click on Download JBuilder 7 Personal - FREE! [*sic!*]
3. Select JBuilder 8 Personal. For this, you have to become a member of the Borland Community. To achieve this, click on the **STEP 1** link. (If you are already a member, type in the requested information into the appearing window and press the **Submit** or the **Login** button. Then continue by step 4.)
  - a) Type in the requested information and press the **New User** button.
  - b) Fill out the form with the appropriate (personal) data and press the **Continue** button. (In case your user name is already in use or other error occurs, repeat this step till necessary.)
  - c) Fill out the questionnaire and press the **Submit** button. Your activation code is sent to the e-mail address you have given. (Your browser should get redirected to the Terms and Conditions page, while the Borland Community site should pop up in a new window. Don't bother with the latter, let's focus on the former!)
  - d) Select the **Hereby I consent** radio button from the appearing set and press the **Submit** button.
  - e) Fill out the survey and press the **Submit** button.

You are done with establishing your Borland Community membership. You can continue on the next step.

4. Type in your e-mail address again and press the **Submit** button. (Note, that you will need the information sent to this address.)
5. Select the **jb8\_windows.zip** link (assuming your running a Windows OS). We suggest selecting the HTTP download.
6. When asked, answer **Save it to disk** and press the **OK** button.

7. After your browser initiates the download, you have to specify the location on your hard drive where you want to store the installation package. We suggest storing the file into the **C:\Install** directory where you downloaded the Java SDK package. (In the following we'll use the assumption that you have stored the install package in this folder. In case you have decided otherwise, you will need to adapt the following description.) It may take a few minutes while your computer downloads the package. Wait until it is ready.

8. Now you have to open up the folder, where you have stored the downloaded package. To do this, double-click on the 'My Computer' icon on the top-left corner of your computer desktop (screen). In the window that popped up, double-click on the icon of drive **C:**. Continue by double-clicking on the **Install** folder.

9. To continue you need the **WinZip** program to be installed on your computer. If you don't have it, see Appendix A.

10. To install JBuilder 8 Personal double-click on the **jb8\_windows.zip** icon and select the **I Agree** button on the appearing dialog box.

11. Now, you have a WinZip window containing the files of the compressed JBuilder. Select the **Extract** button from the toolbar. Type in **C:\Install\** in the **Extract to** field and press the **Extract** button. When WinZip has finished extracting the files (indicated by the green light in the bottom-right corner of the WinZip window's frame) quit by selecting **File/Exit** from the menu.

12. Double-click the **jb8\_windows** icon in the **C:\Install** window and then on the **foundation** folder. In the window popping up, double-click on the **per\_install.exe** icon.

13. Wait till the installer prepares for the installation and then select **English** from the pull-down menu and press the **OK** button.

14. Press the **Next** button in the window popping up. Then read the license agreement carefully, check the check-box at the bottom of the window and press the **Next** button again. Accept all the configurations offered by the installer.

15. By this time you should have received the activation key of your copy of JBuilder 8 Personal. Check your e-mails and follow the instructions in the mail you've received from Borland.

16. Now you have to open up the JBuilder 8 Personal folder. To do this, double-click on the 'My Computer' icon on the top-left corner of your computer desktop (screen). In the window that popped up, double-click on the icon of drive **C:**. Continue by double-clicking on the **Jbuilder8** folder and then on the **bin** folder. Click on the **JbuilderW.exe** icon and, holding the left mouse button down, drag the icon over your desktop and place it on the right-hand side of it. When releasing the mouse button an icon with the text **Shortcut to JBuilderW.exe** should appear on your screen. This is the icon you are going to use to start your Java programming environment.

17. Double-click on the JBuilder shortcut you have just created in step 16. This will run JBuilder.

Now, you have your Java development environment installed on your computer.

### ***Appendix A -- Installing WinZip***

1. Download the WinZip package from

<http://www.winzip.com/downauto.cgi?winzip80.exe>

After your browser initiates the download, you have to specify the location on your hard drive where you want to store the installation package. We suggest storing the file into the **C:\Install** directory where you downloaded the Java SDK package. (In the following we'll use the assumption that you have stored the install package in this folder. In case you have decided otherwise, you will need to adapt the following description.) It may take a few minutes while your computer downloads the package. Wait until it is ready.

2. Now, you have to open up the folder, where you have stored the downloaded package. To do this, double-click on the 'My Computer' icon on the top-left corner of your computer desktop (screen). In the window that popped up, double-click on the icon of drive **C:**. Continue by double-clicking on the **Install** folder.

3. Double-click on the **winzip80.exe** icon to run the WinZip installer. Select the **Setup** button in the window that pops up. In the next window, we suggest accepting the offered location (**C:\Program Files\WinZip**). Do so by pressing the **OK** button. Select **Next** in the next window and then, after carefully reading the licensing information, the **Yes** button. Continue by selecting the **Next** button in the next appearing window. Select the radio button next to **Start with WinZip Classic** and press the **Next** button. In the window appearing next select the **Express Setup** radio button and press **Next**. Find the **WinZip Setup** window again (perhaps under the window that popped up containing the installed WinZip files) and press the **Finish** button. Now, you have WinZip installed on your computer. In fact, you have it running right away. We suggest selecting the **Never show tips at startup** menu item from the pull-down menu and pressing the **Close** button. Quit WinZip for now by selecting **File/Exit** from the menu.

## Installing Repast and the Steps of the IPD Tutorial

This document will guide you through the process of installing the Repast agent-based modeling environment and the steps of the IPD Tutorial. We assume that you have JDK and JBuilder5/6/7/8 Personal installed on your computer. We also assume that you have an appropriate (un)zipping tool (such as **WinZip** for Windows computers or **StuffIt Expander** for Mac's) available on your computer. If this is not the case, please refer to the 'How to install JBuilder' manual for details of getting it.

We will discuss the following steps:

4. Installing Repast (version 2.0 or later)

5. Installing the steps of the Tutorial

6. Configuring JBuilder for Repast.

7. Configuring your project to use Repast.

8. Finally, we provide information about how to uninstall previous versions of Repast. As this is something most of you won't need, it comes as an Appendix.

### *Installing Repast*

This section describes the installation process of the Repast package. We assume that you already have the java development environment installed on your computer, as described in a separate document.

6. Download the package from <http://repast.sourceforge.net/#download>. Click on the **repast-2.0.zip** link. After your browser initiates the download, you have to specify the location on your hard drive where you want to store the installation package. We suggest storing the file into the **C:\Install** directory [or into the **Install** folder on your Mac].

7. Extract the contents of the file to the **C:\** directory [directly to your Mac] by double clicking on it. This should create a directory named **repast-2.0** and a number of other folders in it. [Note that your Mac StuffIt Expander may *not* ask for a location and unpack the file into a **repast-2.0** folder under **Install**. In this case, move the whole folder to your **Macintosh HD** folder.]

Now, you have Repast installed on your computer. You can try it by running one of the demo models. To do this, select one of the demo models by opening its directory in the open the directory **C:\repast-2.0\demo\** [the **repast-2.0\demo** folder on your Mac]. If you are using windows, you can run the model by double clicking on the **.bat** file.

[If you are using Mac OS X, your task is a bit more complicated.

e) First, open up the **Terminal** application (in the **Applications/Utilities/** folder -- please note that this is an OS X application).

f) If this is the first time you try to run the demo models, type in the following and press Enter after each line. Otherwise, continue on the next step.

```
cd /repast-2.0/demo/  
chmod -R a+x *
```

g) Type in the following, pressing Enter after each line. (Where <model> stands for the folder containing the demo model you are about to run. E.g., **sscape** in case of the Sugar Scape model.)

```
cd /repast-2.0/demo/<model>  
<model>.sh
```

]

### ***Installing A Step of the IPD Tutorial***

This section describes the process of installing one step of the IPD Tutorial. For this, we assume you have followed the steps in the previous section and you already have the Repast package installed on your computer.

18.If this is the first time you install a step of the tutorial, create a directory named **Tutorial** in the **C:\repast-2.0\** directory [**repast-2.0** folder on your Mac]. Otherwise, continue on the next step.

19.In the following, we will assume that you are installing the first step, called **SimpleIPD**. Download the step from the course web site. To do this, click on the **SimpleIPD.zip** link under the Tutorial section of the site.

8.Extract the contents of the file to the **C:\repast-2.0\Tutorial** directory [**repast-2.0\Tutorial** folder on your Mac] by double-clicking on it. [Note that your Mac StuffIt Expander may *not* ask for a location and unpack the file into a folder under **Install**. In this case, move the whole folder to you **Macintosh HD** folder and make sure you have a **SimpleIPD** folder under **repast-2.0\Tutorial**.]

Now, you have the first step of the tutorial installed on your computer. In order to run it and to configure JBuilder for using the Repast package, you need to follow the steps in the next section.

### ***Configuring JBuilder for Repast***

This section guides you through the steps of configuring JBuilder for Repast. For this, we assume that you have followed the steps in the previous sections and you already have the Repast package and the first step of the IPD Tutorial installed on your computer.

4.Start JBuilder.

5.Select **File/Open Project** from the menu.

6.Navigate your way to the **C:\repast-2.0\Tutorial\SimpleIPD\** directory [**repast-2.0\Tutorial\SimpleIPD\** folder on your Mac] in the file browser that comes up.

7.Open the project by selecting **SimpleIPD.jpr**.

8.Select **Project/Project Properties** from the menu. Select the **Paths** tab in the dialog box and then the smaller tab **Required Libraries** in the middle part of the panel.

9.If you have **Repast** written in *red letters* in the list box, delete it by pressing the **Remove** button. If the list box is empty, continue.

10.Press the **Add** button. In the dialog box popping up, press **New**.

11.Type in **Repast-2.0** (please, note the spelling) as **Name**. Make sure you have the default **UserHome** text as **Location**. Press the **Add** button.

12.In the file browser that comes up, navigate your way to the **C:\repast-2.0\lib\** directory [**repast-2.0\lib\** folder on your Mac]. Open up the folder by clicking on the small '+' icon next to it.

13.Select *all* the files in that directory (there should be 13 of them) and press **OK**. The files you've selected should appear in the **Library paths** box below. Make sure, you have all the 13 of them. (If any of them is missing, press **Add** again, and try to locate the missing one.)

14.Press **OK** three times in the subsequent windows on your way back to JBuilder's main screen.

**If you are using Mac OS X, you may have a few more steps to do:**

15. Select **Project/Default Project Properties** from the menu and choose the **Paths** tab from the window coming up.

16. Press the button aligned with the **JDK:** label. In the **Select a JDK** window that comes up click on **New**.

17. Click on the button close to the **Existing JDK home path** label. In the file browser, select the following folder:

**/System/Library/Frameworks/JavaVM.framework/Versions/1.3.1/Home/**

(The other two fields of the window should now contain the **java 1.3.1-root-010613-0207** and **User Home** texts, respectively.)

18. Press **OK**, and then twice again.

Now, you have JBuilder configured for Repast and thus, for the first step of the IPD Tutorial. Select **Run/Run Project** from the menu (or press the appropriate button) to try it.

***Configuring Your Project to Use Repast***

In this section we discuss how to configure your *own* projects to use Repast. Note that these steps are not required to run any of the Tutorial steps, but are needed when you set out to build your own model from the scratch. Nonetheless, we will assume that you have at least one step of the IPD Tutorial installed on your computer, and that you have configured JBuilder for Repast as described in the previous section.

Here are the steps you need to make in order to turn your project a ‘Repast project’.

f) After you have JBuilder running and your project opened, select **Project/Project Properties** from the menu. Select the **Paths** tab in the dialog box and then the smaller tab **Required Libraries** in the middle part of the panel. Press the **Add** button.

g) In the upcoming dialog box, select **Repast-2.0** from under the **UserHome** folder. Press **OK**.

h) Press OK again in the remaining dialog box.

Now, you have your project configured to use Repast.

***Appendix -- Uninstalling Previous Versions of Repast***

If you have a previous version of Repast on your computer and you do not want to keep it, simply delete the folder where you have it installed (e.g., **C:\repast\**). If want to keep the previous version, rename the folder to which it was installed (e.g., rename the folder **C:\repast\** to **C:\repast-old\**).

## How to use your JBuilder Development Environment

This document will guide you through the main technical steps of creating your first Java program with JBuilder. The steps covered are the creation of a new project (named **MyProject**) that contains a simple class (**Example**), as well as the compilation and execution of this program.

The program covered in this document corresponds to the first simple program of Module 1 in the Schildt book. Moreover, the steps discussed here cover the knowledge you need to implement the examples and exercises of Modules 1, 2 and 3 using JBuilder.

How to use your JBuilder 5 Development Environment .....	9
Creating a new project.....	9
Creating a new class.....	12
Compiling your class.....	15
Running your class (program) .....	16

### Creating a new project

19. Make sure you have the JBuilder Personal environment running.

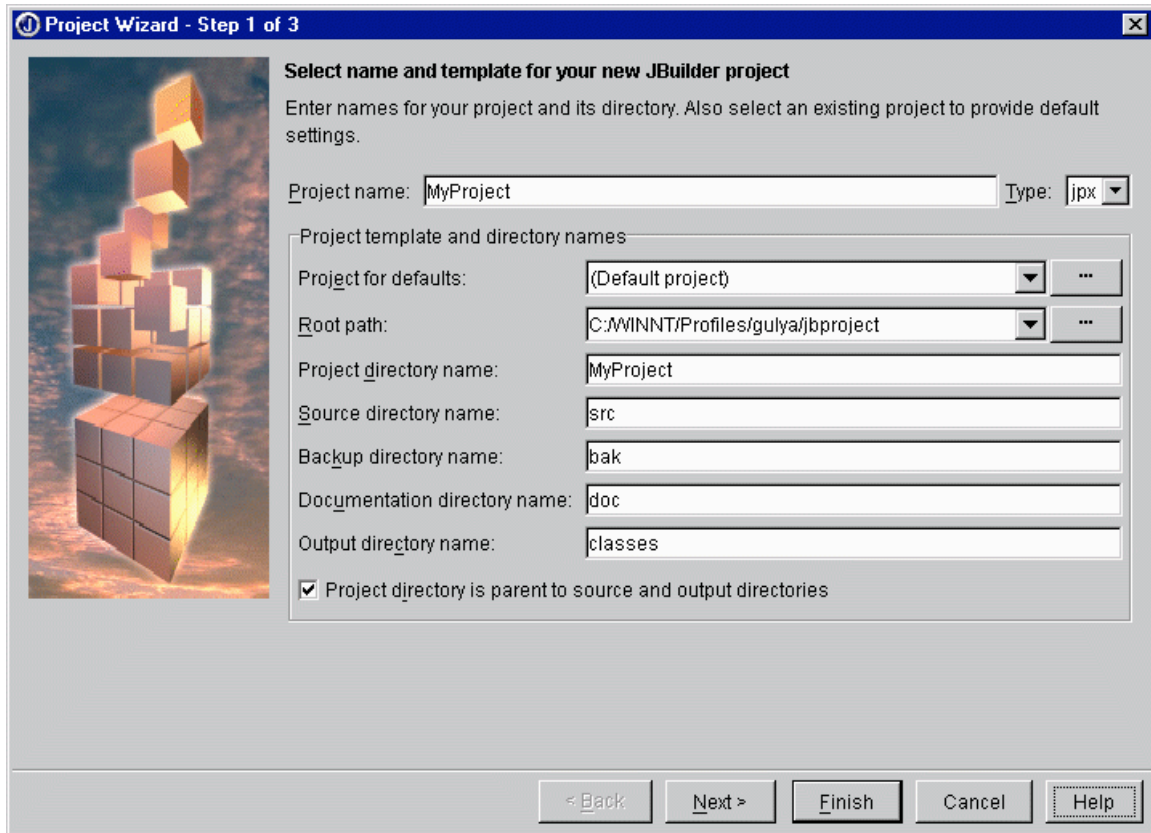


Figure 1 Creating your project, Step 1

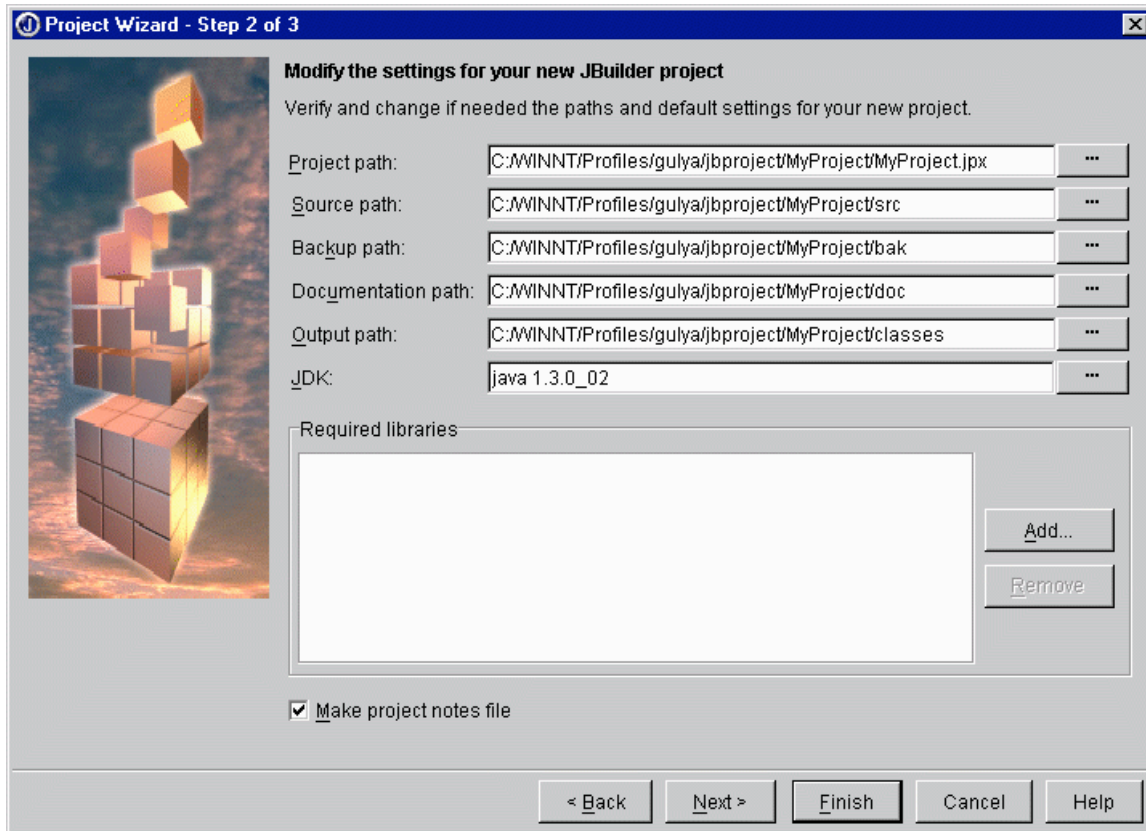
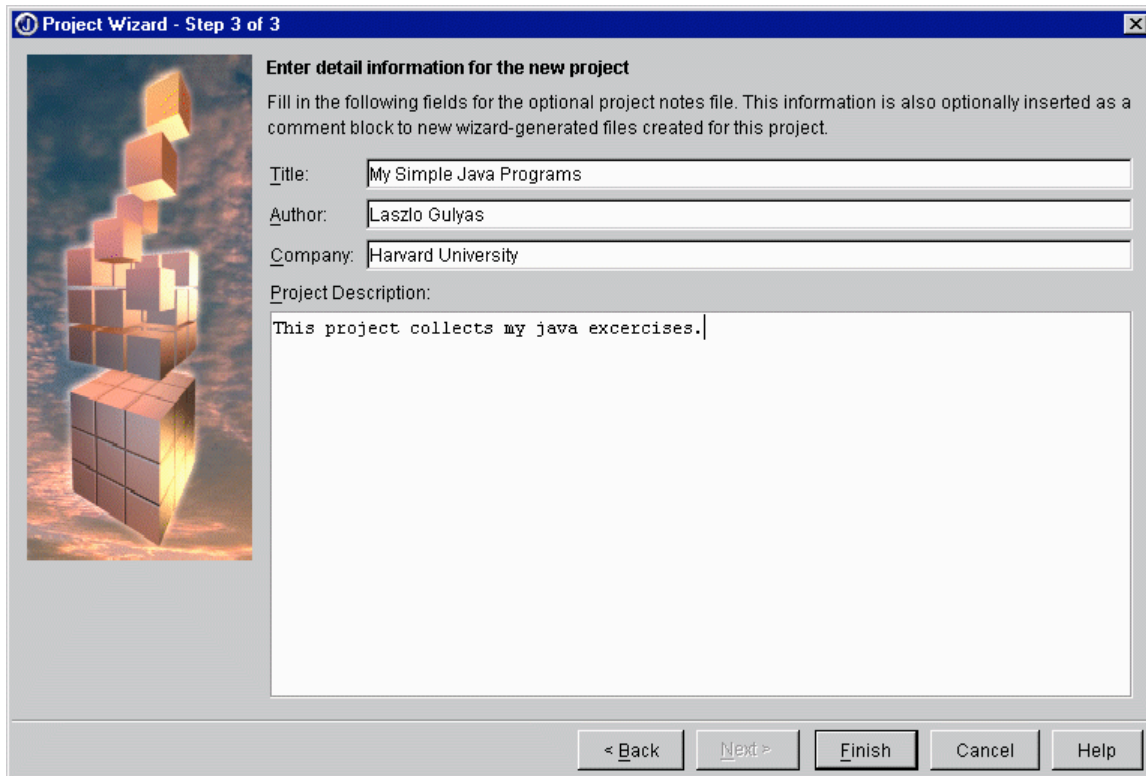


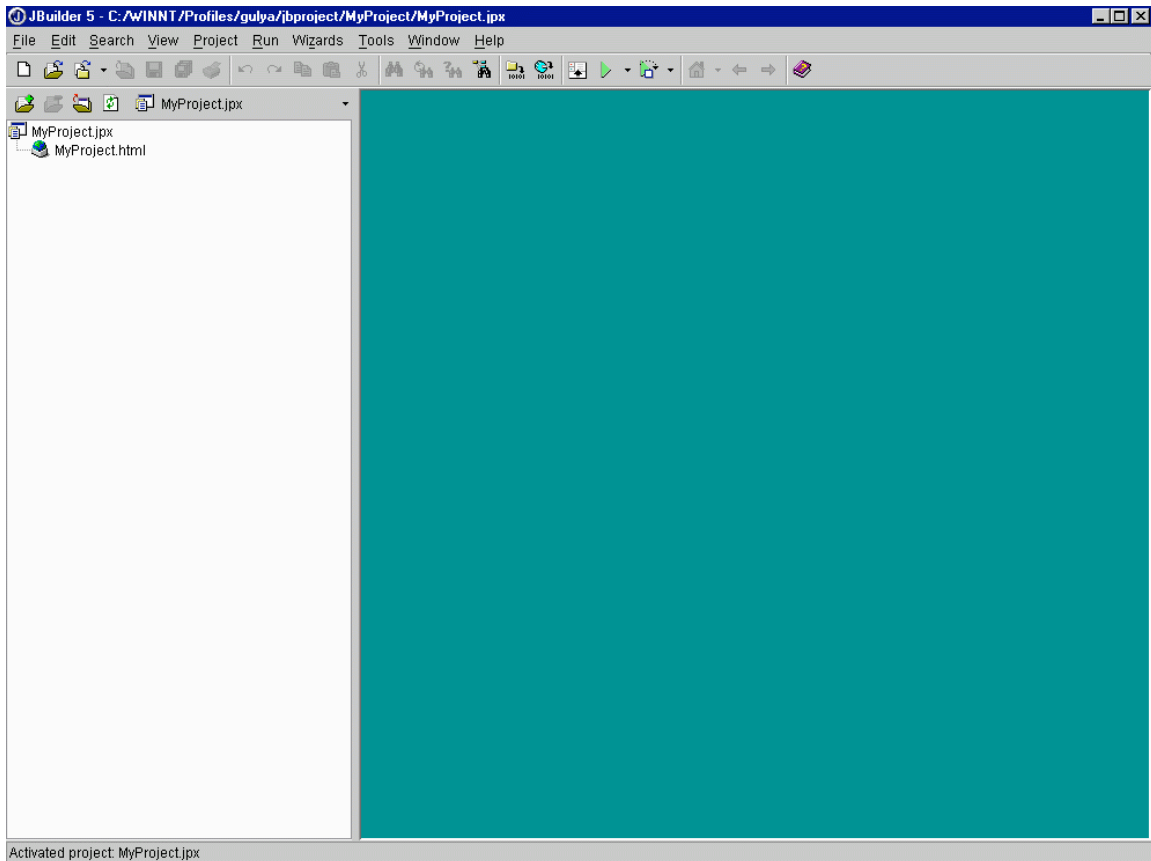
Figure 2 Creating your project, Step 2 (Up)

Figure 3 Step 3 (Down)



20. Choose **File/New Project** from the menu. This results in a series of dialog boxes coming up.

21. Fill them in as shown in Figures 1, 2 and 3. (Note that the name of your project is **MyProject**). Press the **Next** button to move between the dialog boxes and press **Finish** when you are done with them. (You could simply press **Finish** after filling in the first dialog box if you don't care to give the details on the third one.)



**Figure 4 Your project (just created)**

Your project is now created. Your screen should look like the one shown on Figure 4. To be able to write your program, you need a class.<sup>4</sup> Let's move on and create your first class!

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<sup>4</sup> At this point let's just content ourselves with this. Classes are an important concept of object-oriented programming, but that discussion will come later during the course.

### Creating a new class

9. In order to create a new class, select **File/New class** from the menu. A dialog box should come up. Provide the necessary information as shown on shown on Figure 5 and press **OK**. (Note that the name you have given to your new class is **Example**.)

10. Now, your JBuilder window should look like Figure 6. To assign a program to the class, type in the First Simple Program from Schildt's book as shown in Figure 7.

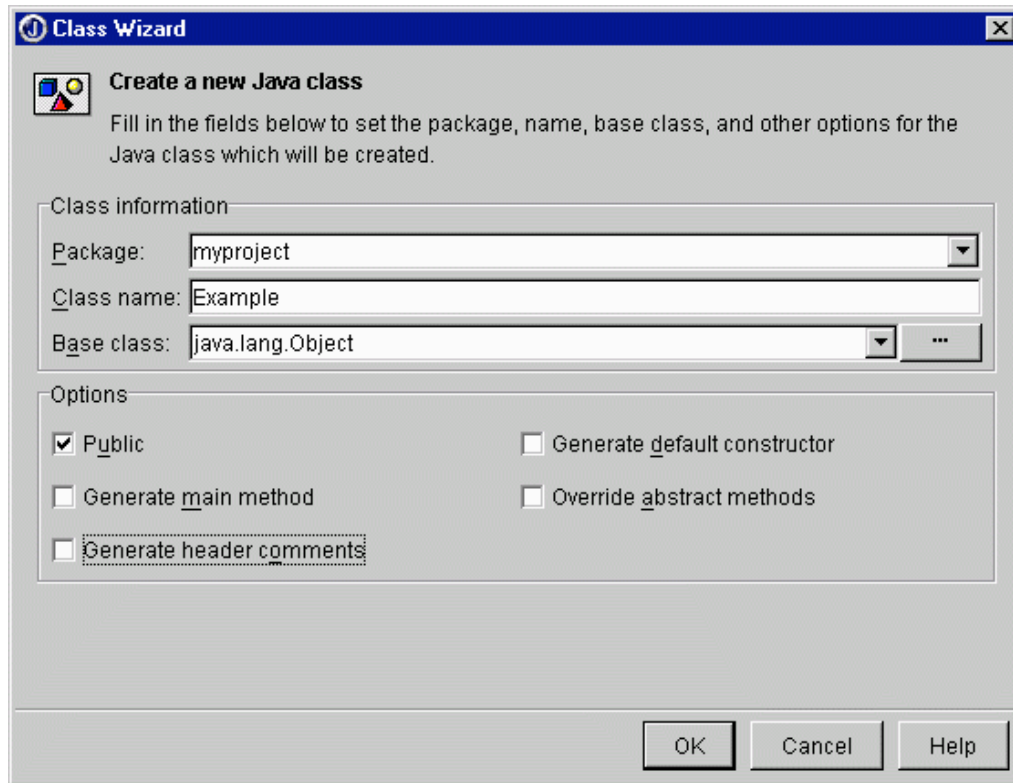
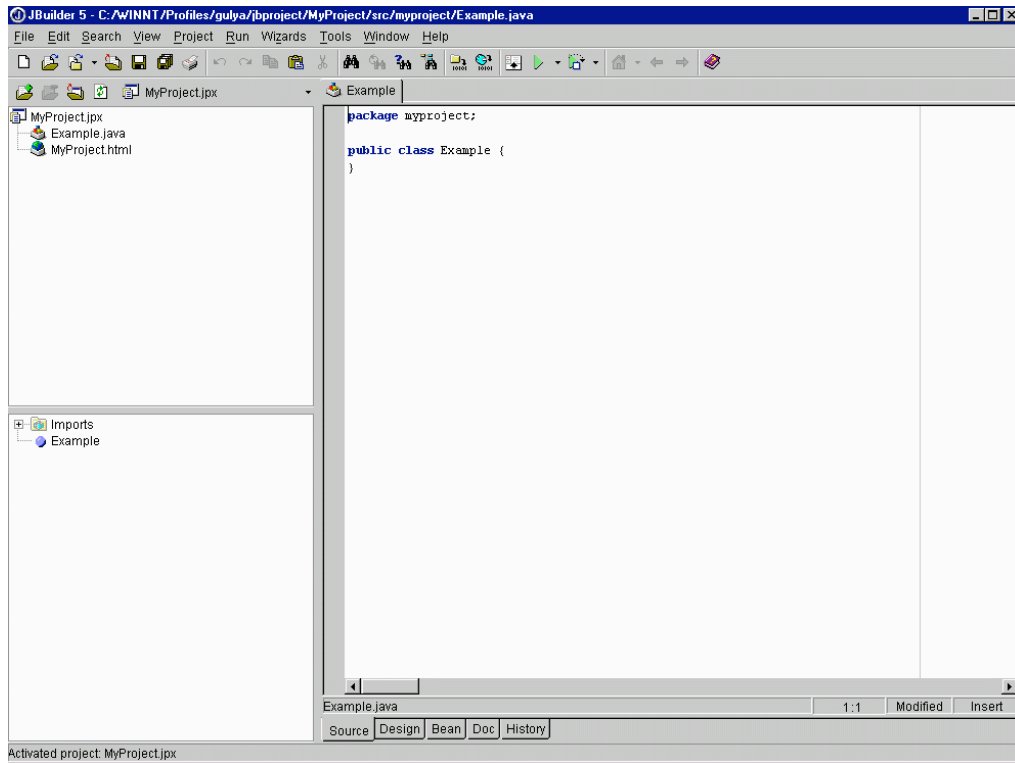


Figure 5 Creating your Example class



**Figure 6 The Example class (just created)**

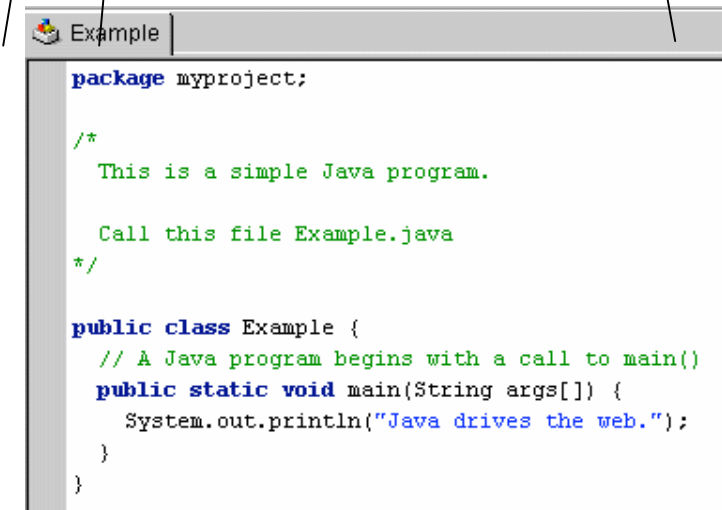
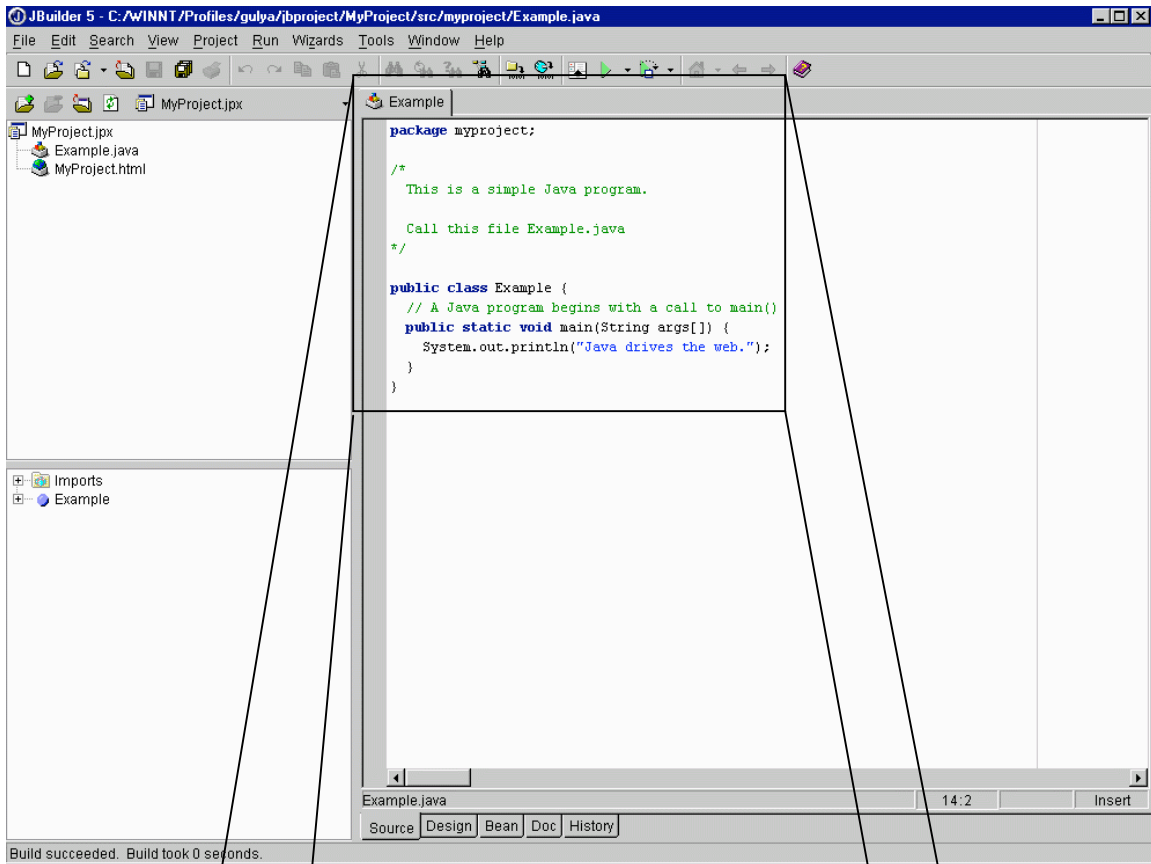


Figure 7 The Example program

## Compiling your class

You have now created a project and a class. In order to be able to run it, you need to compile (make) it.

- h) To make your program, select **Project/Make 'Example.java'** from the menu. (Note that you explicitly chose to compile your program named **Example**.) Jbuilder should start working. After a while (the exact time depends on your configuration) it should report its success in the lower right-hand corner of your JBuilder window as shown in Figure 8. If this is the case, continue on Step 8.
- i) If something went wrong (e.g., you mistyped something) a message panel should appear on the bottom of the JBuilder window containing the compiler's reports on the error. See Figure 9 as an example. (Note that the actual message may differ from the one shown on the picture, depending on the mistake you have made.) Try to understand the message and fix the error, then go to Step 6.

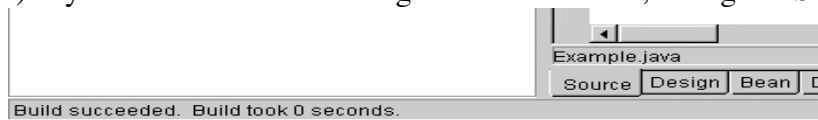


Figure 8 Successful compilation

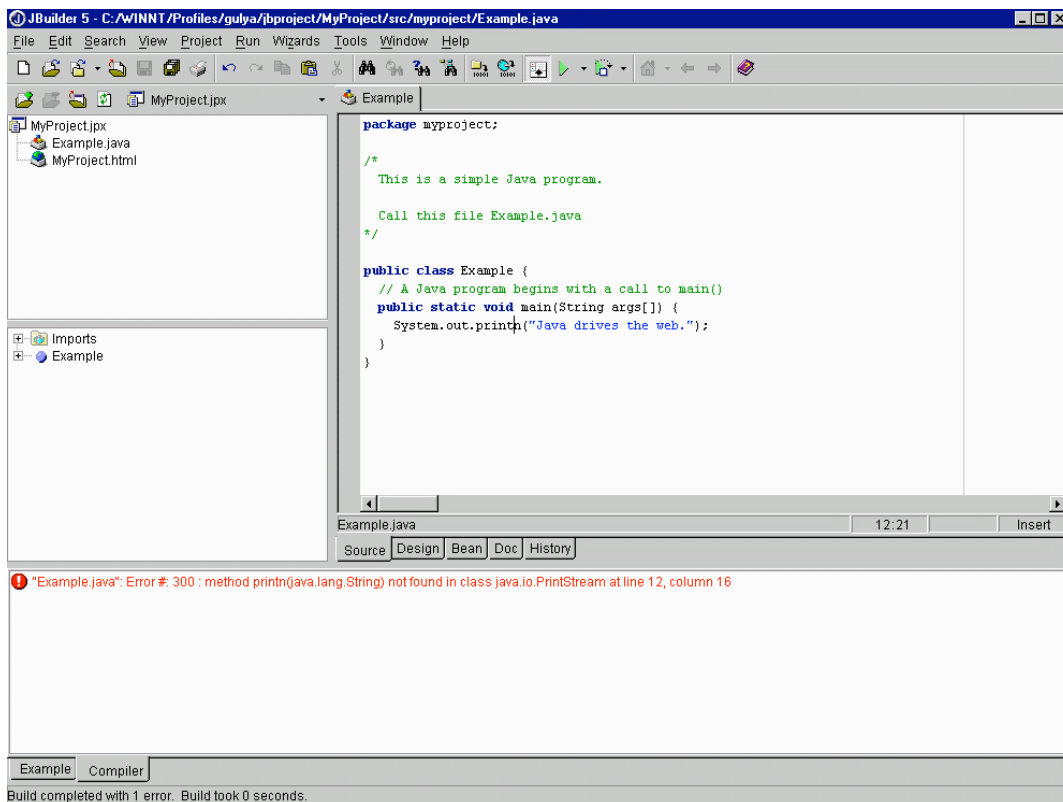


Figure 9 Compilation Error

### **Running your class (program)**

Now, you have not only created your project, your class, but you have also managed to compile it successfully. Congratulations! Let's have a look at it running!

20. Here the way you should follow depends on what you did in the past.

9. If this is the first time you try to run your class, select **Run/Run Project** from the menu. The dialog box shown on Figure 10 should come up. Through this dialog box, JBuilder asks you, which class to run.<sup>5</sup>

10. If you have already run this class before, you don't need to specify the class again. Simply select **Run/Run Project** from the menu and continue on Step 11.

11. If you have already run a class from within this project, but created another class (e.g. for the next exercise) and want to run that class now, select **Project/Project Properties** from the menu. The dialog box shown on Figure 11 should come up. Select the **Run** tab, which will result in a dialog box similar to the one shown on Figure 11. (The only significant difference is that the class you selected last time is shown besides the **Main class:** label.)

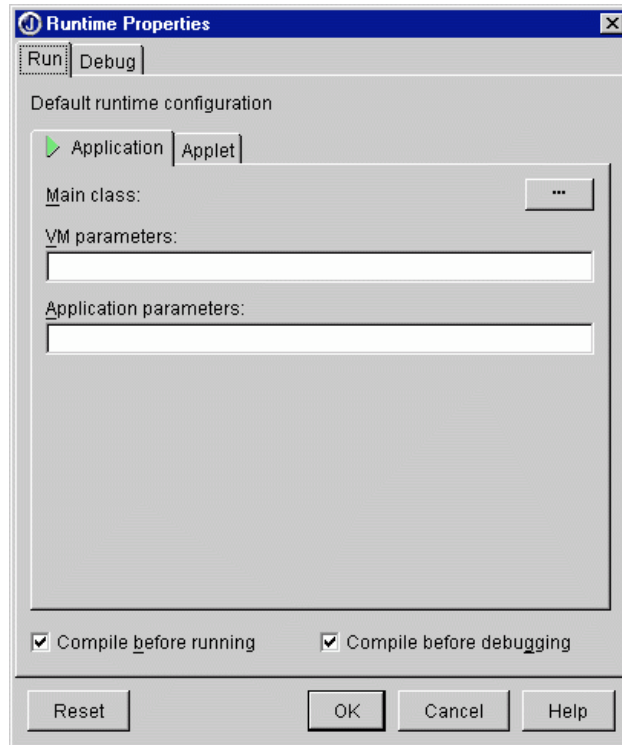
21. Press the button aligned to the **Main class:** label to specify your class. The dialog box shown on Figure 12 should come up. (Note that the actual contents of the list may be different.) Find the folder (called *package* in java) with the name **myproject** and open it up by clicking on the '+' sign beside it. Select the class **Example** and press **OK**. (Note that **myproject** comes from the name of your project, while **Example** is the name of your class.)

22. Press **OK** again in the other dialog box. Now, you have told JBuilder what class to run.

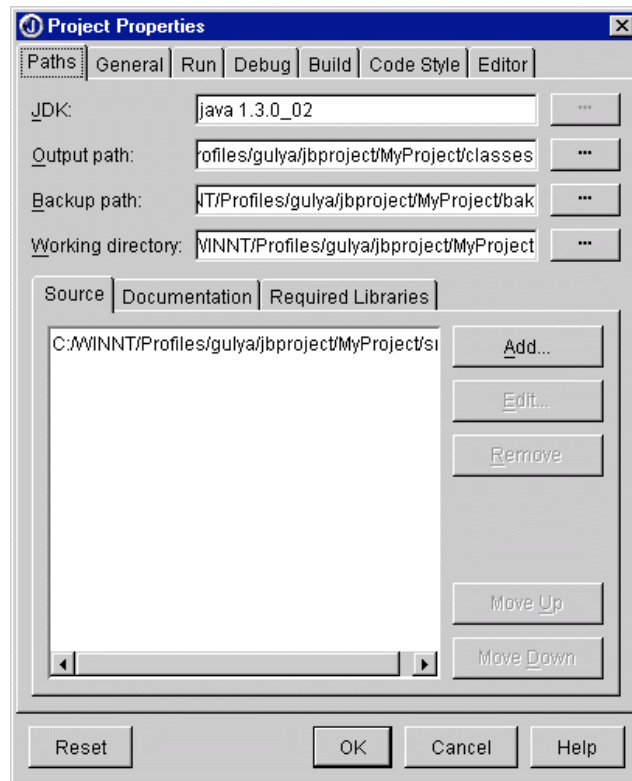
23. Your project should now be running (if not finished). You can check its output on the message panel shown on the lower part of your JBuilder window. (See Figure 13).

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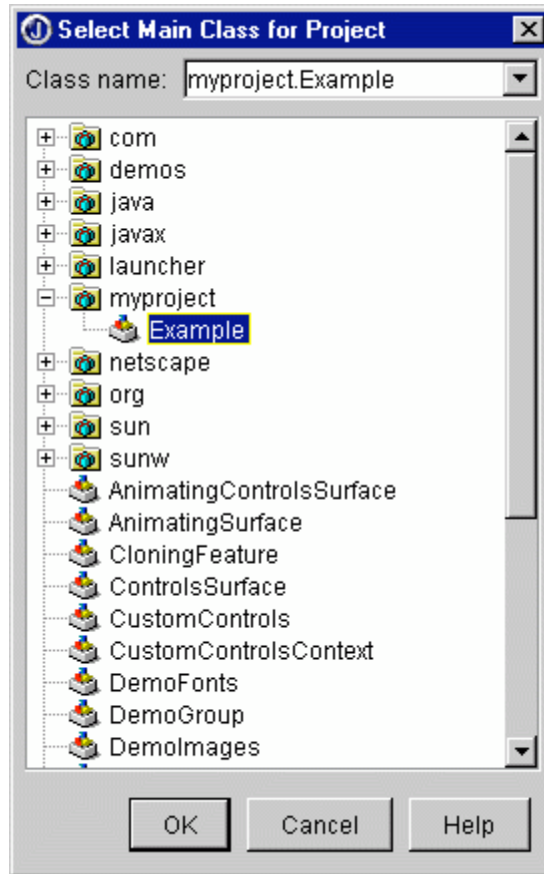
<sup>5</sup> You might think it should already know, since you only have a single one, but the fact is that you have many more without even knowing it. Don't let this bother you for now; that's advanced java. The only thing you should be aware of is that you have to tell JBuilder *explicitly* which class to run.



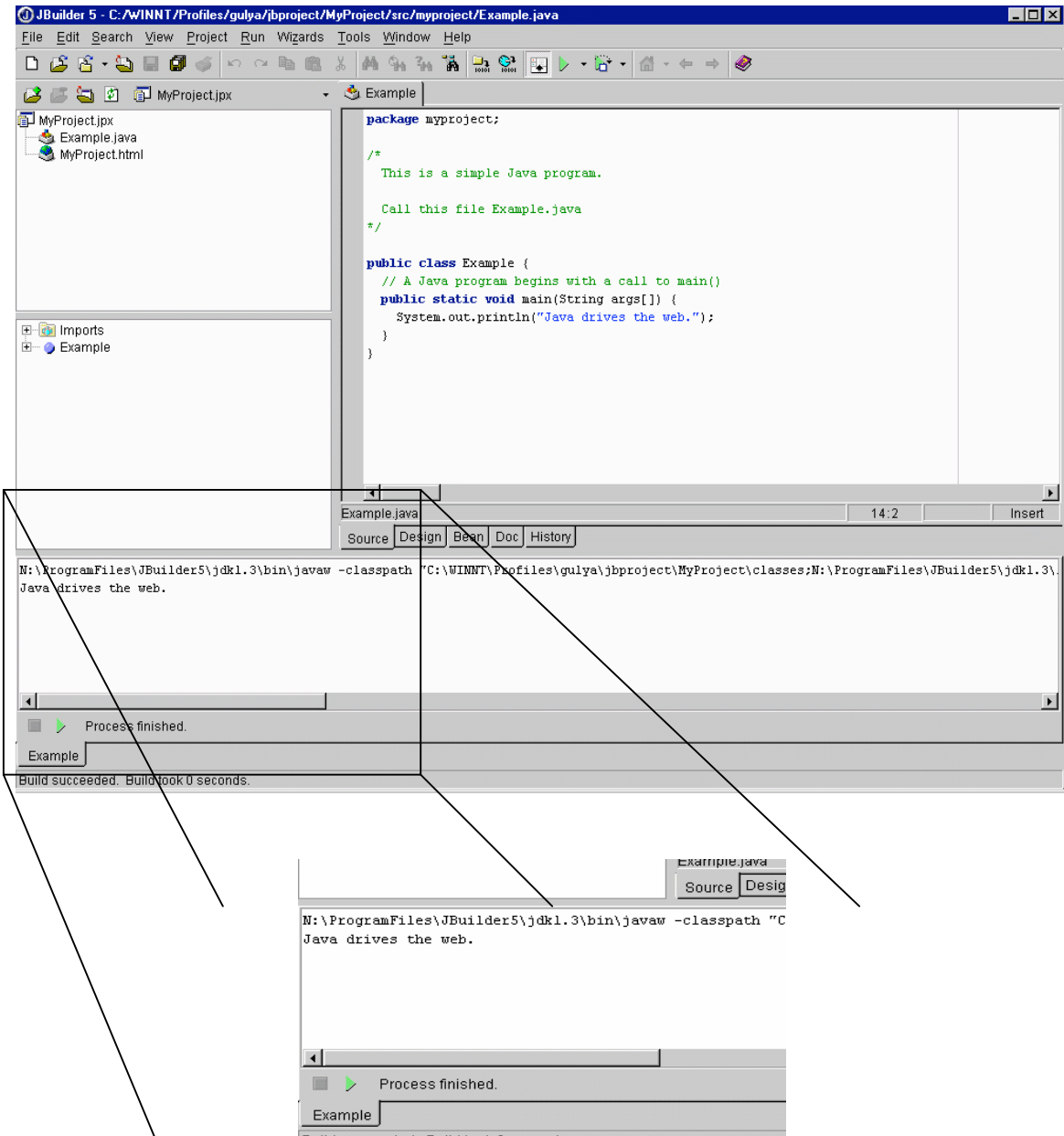
**Figure 10 Specifying the class to run**



**Figure 11 The project properties dialog box**



**Figure 12** Selecting the Example class



**Figure 13 The results**