

Practices for Lesson 1

Practices Overview

In these practices, you run a Java program, first using the DOS command line and then from the NetBeans integrated development environment (IDE).

The practices for this course assume that the following software is installed:

- JDK 1.7.0
- Java API Specification (installed locally)
- Java SE7 Specification (installed locally)
- NetBeans EE Edition, 7.0.1 (GlassFish server only; Tomcat server is not used.)

Practice 1-1: Running a Java Program Using the Command Line

Overview

In this practice, you compile and run a Java program at the command line. A Java technology program is already created for you. In some cases, you may need to first set the PATH variable for the DOS session before running the program. Instructions for setting the PATH are included below.

Assumptions

The Java SE 7 development environment is installed on your computer.

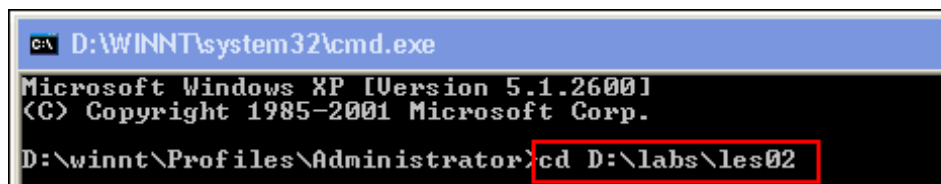
Task: Compiling and Executing a Java Program

In this task, you compile and execute a Java Program.


1. Compile the CalcAverage.java program. The high-level steps for this task are shown in the table below. If you need more assistance, you can use the detailed steps that follow the table.
- 2.

Step	Description	Choices or Values
a.	Open a DOS command window and navigate to:	D:\labs\les02 (or your other folder)
b.	Check the contents of this directory listing to find:	CalcAverage.java
c.	Set the PATH variable to include:	D:\Program Files\Java\jdk1.7.0\bin (or your other folder)
d.	Compile the CalcAverage java source file by typing:	javac CalcAverage.java

- a. From the Windows Start menu, select Start > Run. Enter **cmd** in the Open field and click **OK**. At the prompt, enter **cd D:\labs\les02**. Press Enter.



- b. Check the directory contents by typing **dir** at the command prompt. Press enter to see the results listed.



- c. Confirm that the system PATH points to the correct folder location for the Java executables (the compiler and the runtime executable). Type **PATH** at the prompt and press Enter. You should see **D:\Program Files\Java\jdk1.7.0\bin** appearing

somewhere in the PATH string as shown below.

```
D:\winnt\Profiles\Administrator>PATH
PATH=D:\Program Files\Java\jdk1.7.0\bin;d:\winnt\system32;d:\winnt;d:\winnt\sys
em32\wbem;c:\dos;c:\ntinst.ad;c:\utils;c:\detect;c:\net
```

- a. If it is not there, append this directory to the System PATH variable by entering the following at the command prompt. Press enter.

```
D:\labs\les02>PATH = %PATH%;D:\Program Files\Java\jdk1.7.0\bin
```

You can confirm that the PATH was changed correctly by typing PATH at the next prompt. You should see the jdk1.7.0\bin appearing at the end of the PATH string.

- d. Compile the .java file by typing `javac CalcAverage.java`. Press enter. After a slight delay the prompt will return.

```
D:\labs\les02>javac CalcAverage.java
```

3. Run the CalcAverage.java program. The high-level steps for this task are shown in the table below. If you need more assistance, you can use the detailed steps that follow the table.

Step	Window/Page Description	Choices or Values
a.	Confirm that the file was successfully compiled. List the directory content and look for:	CalcAverage.class
b.	Run the CalcAverage program. It will prompt you to enter three integers separated by spaces. Do so and press enter to see the average of the three integers.	java CalcAverage

- a. Look for the compiled class, `CalcAverage.class`, by listing the contents of the directory again. Type `dir` and press Enter.

```
D:\labs\les02>dir
Volume in drive D is WINNT
Volume Serial Number is FC5C-B059

Directory of D:\labs\les02

06/08/2011  04:57 PM    <DIR>          .
06/08/2011  04:57 PM    <DIR>          ..
06/08/2011  04:57 PM                921 CalcAverage.class
04/22/2011  03:05 PM                641 CalcAverage.java
               2 File(s)              1,562 bytes
               2 Dir(s)  459,428,415,488 bytes free
```

- b. Run the CalcAverage program by invoking the `java` runtime executable. You do not need to use the .class extension of the class. Type `java CalcAverage` and press Enter. The program will prompt you to enter three integers.

```
D:\labs\les02>java CalcAverage
Enter 3 Integers separated only by spaces: <example 20 30 40>
```

Type three integers separated by spaces and then press Enter.

```
D:\labs\les02>java CalcAverage
Enter 3 Integers separated only by spaces: (example 20 30 40)
2 46 88
Average = 45
```

This is how you would compile and run a Java program using only a DOS console or terminal window.

Practice 1-2: Running a Java Program Using NetBeans IDE

Overview

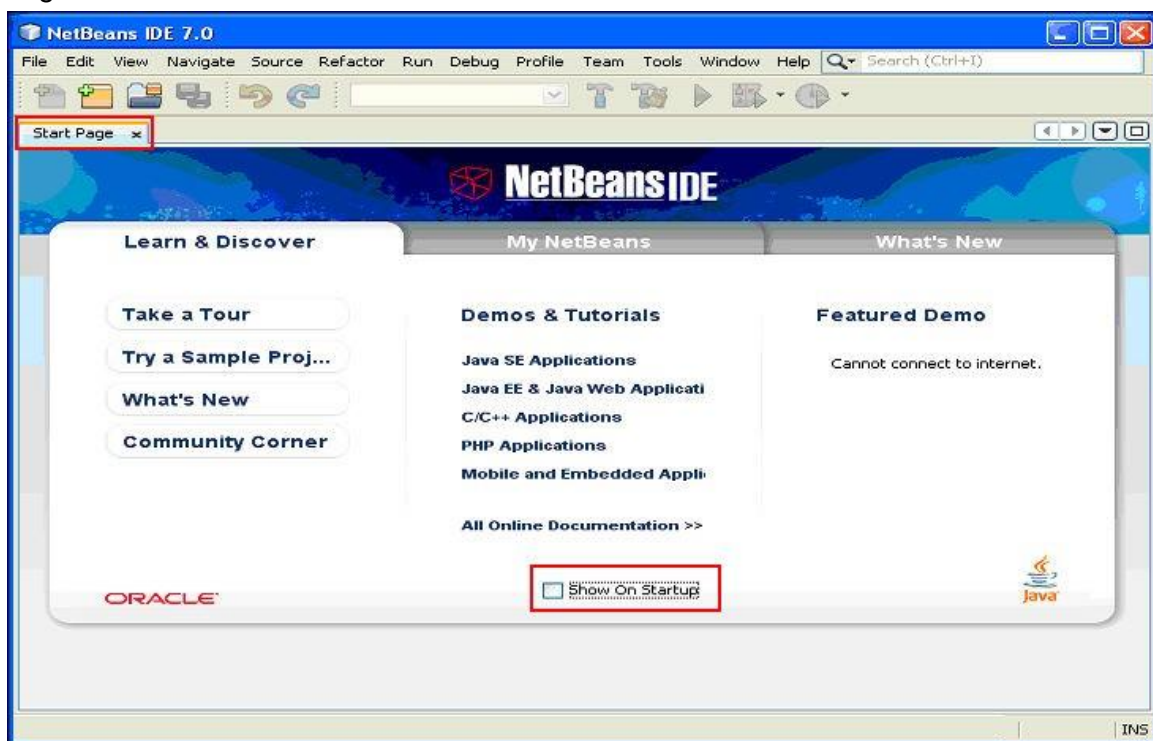
In this practice, you compile and execute a Java program using NetBeans IDE. In addition, you explore some features of an IDE that let you develop programs more quickly and easily than if you use a command line.

Assumptions

The NetBeans 7.0.1 IDE is installed on your computer.

Tasks

1. Double-click the NetBeans icon from your computer desktop.
2. When NetBeans opens, deselect the **Show On Startup** check box and close the Start Page.

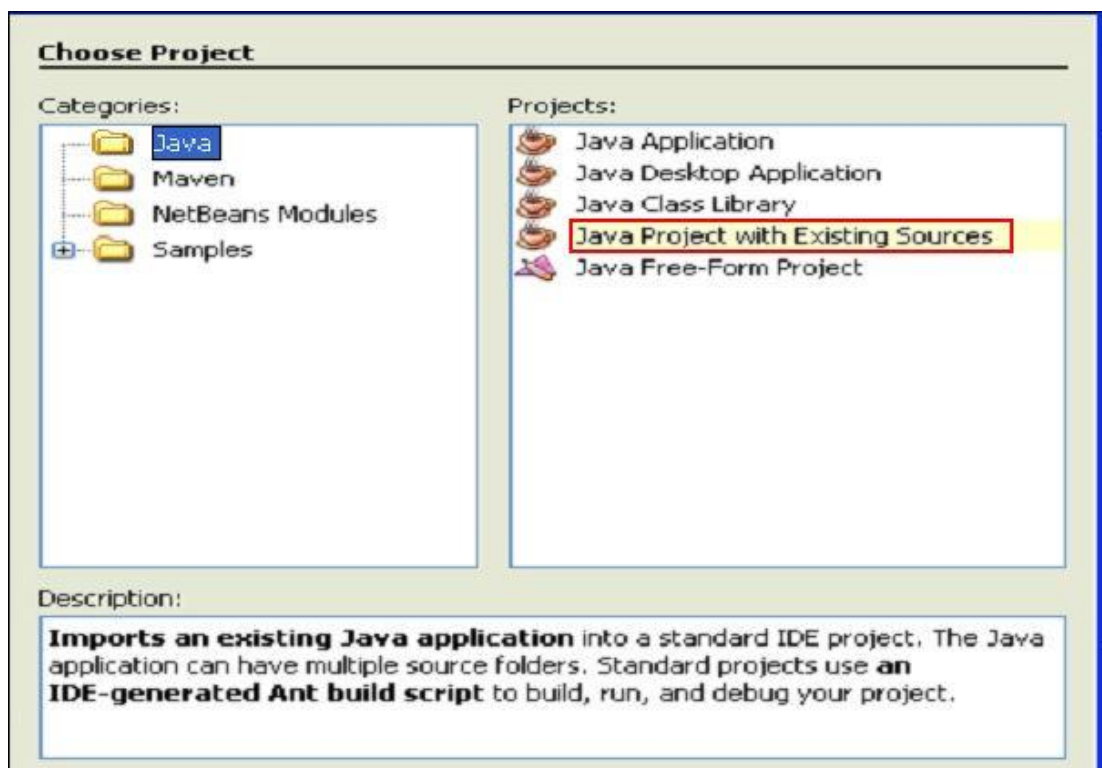


3. Create a NetBeans project that includes the CalcAverage.java file in its project source folder. The high-level steps for this task are shown in the table below. If you need more assistance, you can use the detailed steps that follow the table.

Step	Window/Page Description	Choices or Values
a.	Main menu	File > New Project ...
b.	New Project wizard: Choose Project step	Categories: Java Projects: Java project with existing source Click Next
c.	New Project wizard: Name and Location step	Project Name: Practice02 Deselect the Set as Main Project check box Click Next

Step	Window/Page Description	Choices or Values
d.	New Project wizard: Existing Sources step	Source Packages Folder: Browse to select D:\labs\les02 (or your other folder) Click Finish
e.	Prompt window	Delete existing class files within the package folder. The new project appears in the Project's window of NetBeans.

- Select **File > New Project** from the main NetBeans menu. The New Project wizard opens.
- In the **Choose Project** step of the wizard (shown in the left column), select "Java" from the Categories column. Select "Java project with existing source" from the Projects column. Click **Next**.



- c. In the **Name and Location** step of the wizard, enter “Practice02” for the Project Name and deselect the **Set as Main Project** check box. Click **Next**.

The screenshot shows the 'New Java Project with Existing Sources' wizard at the 'Name and Location' step. The 'Steps' panel on the left lists: 1. Choose Project, 2. **Name and Location**, 3. Existing Sources, and 4. Includes & Excludes. The main area is titled 'Name and Location' and contains the following fields and options:

- Project Name:** A text box containing 'Practice02'.
- Project Folder:** A text box containing 'ocuments\NetBeansProjects\Practice02' with a 'Browse...' button to its right.
- Build Script Name:** A text box containing 'build.xml'.
- Use Dedicated Folder for Storing Libraries:** An unchecked checkbox.
- Libraries Folder:** A text box with a 'Browse...' button to its right.
- Set as Main Project:** An unchecked checkbox.

Below the fields is a note: 'Different users and projects can share the same compilation libraries (see Help for details)'. At the bottom are buttons: '< Back', **Next >**, 'Finish', 'Cancel', and 'Help'.

- d. In the **Existing Sources** step of the wizard, add D:\labs\les02 to the Source Packages Folder panel by clicking **Add Folder** and browsing to the desired directory. Click **Finish**.

The screenshot shows the 'New Java Project with Existing Sources' wizard at the 'Existing Sources' step. The 'Steps' panel on the left lists: 1. Choose Project, 2. Name and Location, 3. **Existing Sources**, and 4. Includes & Excludes. The main area is titled 'Existing Sources' and contains the following fields and options:

- Source Package Folders:** A list box containing 'D:\labs\les02'. To its right are 'Add Folder...' and 'Remove' buttons.
- Test Package Folders:** An empty list box. To its right are 'Add Folder...' and 'Remove' buttons.

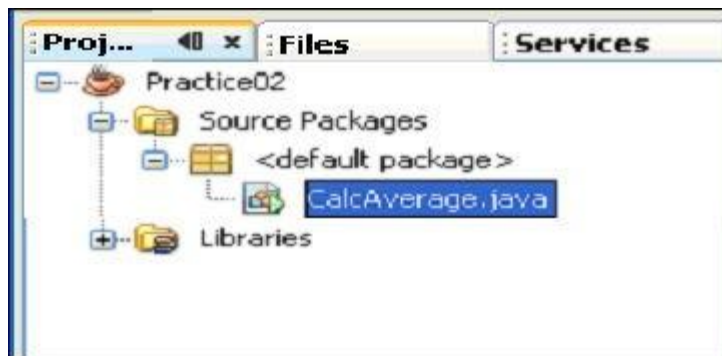
Below the list boxes is a note: 'You can drag&drop both source and test packages from one list to the other.' At the bottom are buttons: '< Back', 'Next >', **Finish**, 'Cancel', and 'Help'.

- e. You are now prompted with the message “The specified package folders contain compiled class files”. Click **Delete** to delete the CalcAverage.class file that was

generated in the previous practice when you compiled the CalcAverage.java file from the DOS console. NetBeans will generate a new class file for you in this practice.



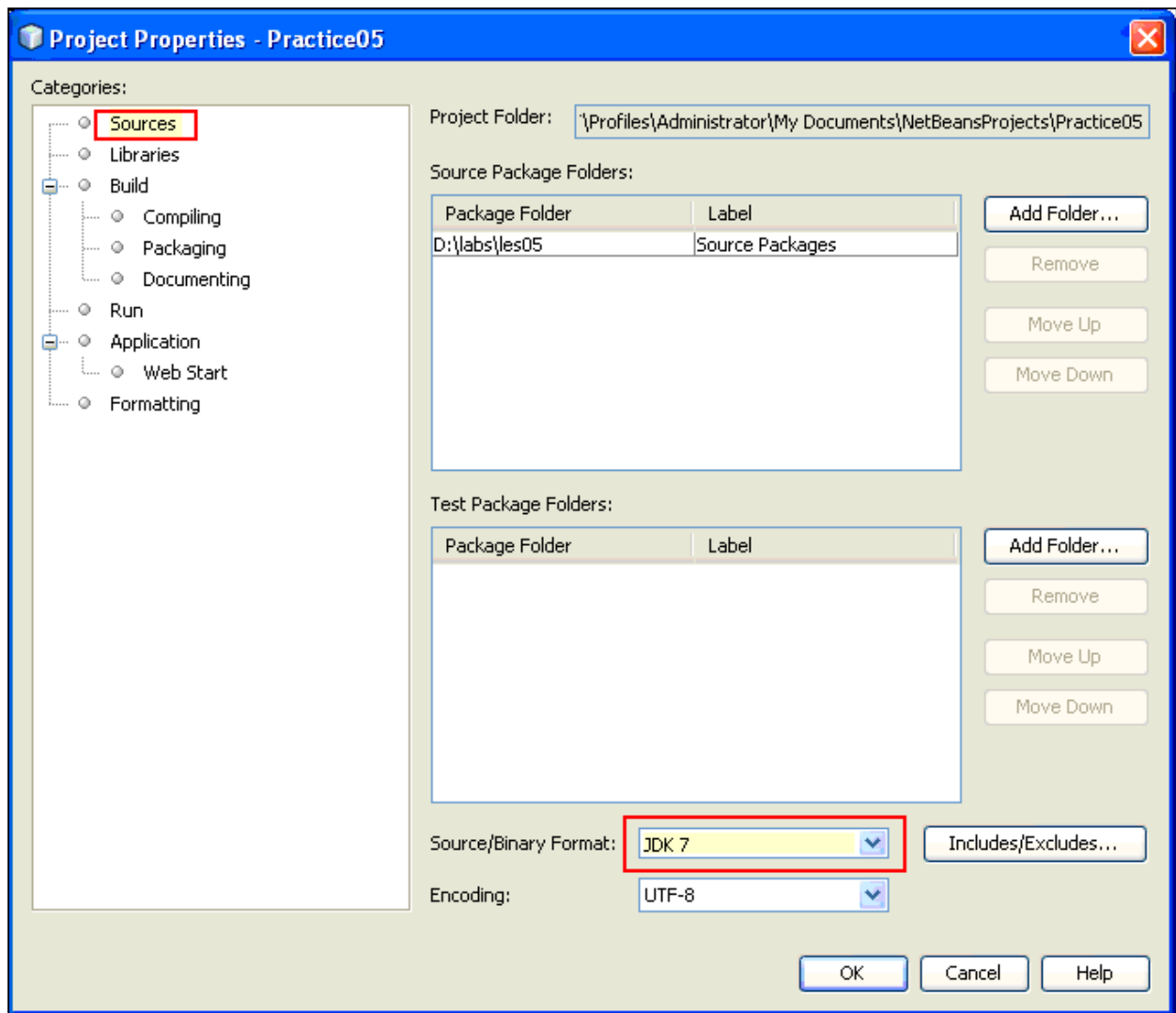
The contents of the project are now displayed in the **Projects** window within upper left pane of NetBeans. Click the Projects tab if necessary to view the Projects window. Here you see the project name at the root node. Expand the nodes beneath that to find CalcAverage.java.



4. Modify the properties of this project to set the Source/Binary Format property to JDK 7. This will allow you to use any new language features of Java SE 7 without getting an error message from NetBeans. The table below provides the high-level steps. If you need more details, follow the steps below the table.

Step	Window/Page Description	Choices or Values
a.	Main menu	File > Project Properties (Practice02)
b.	Project Properties window Source category	Source/Binary Format field = JDK 7
c.	Project Properties window Libraries category	Confirm that Java 7 is listed as the Java Platform
d.	Project properties window	Click OK

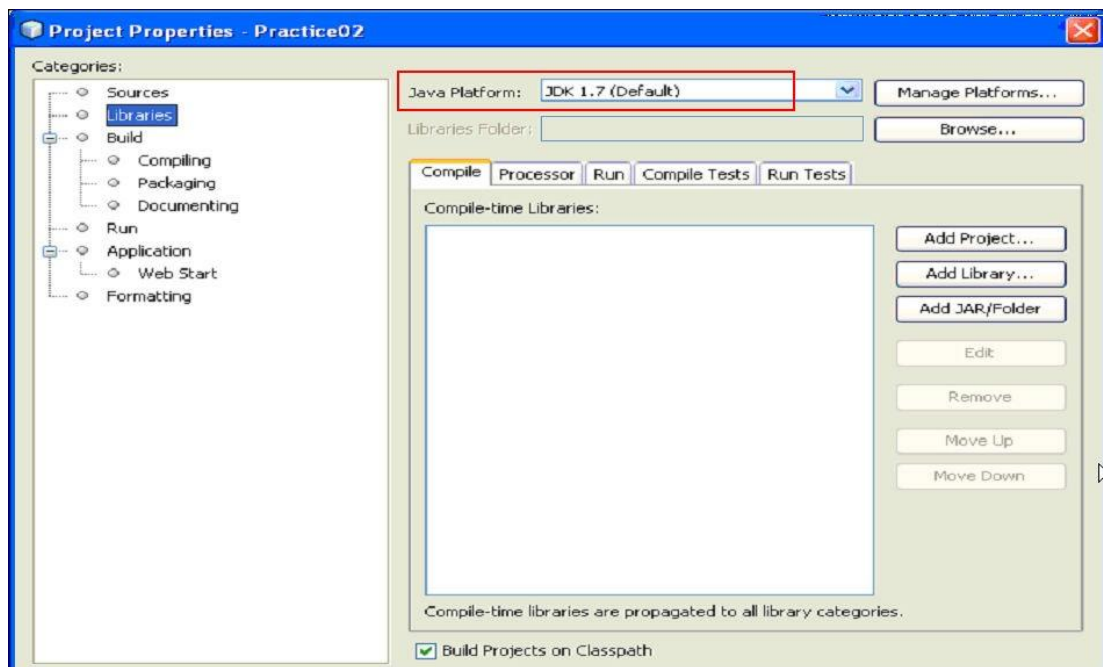
- a. Select **File > Project Properties (Practice02)** from the main menu. (Alternatively, right-click the **Practice02** project node in the Projects window and select **Properties**). The Project Properties window opens.
- b. Select **Sources** in the Categories column. Set the **Source/Binary Format** field to "JDK 7".



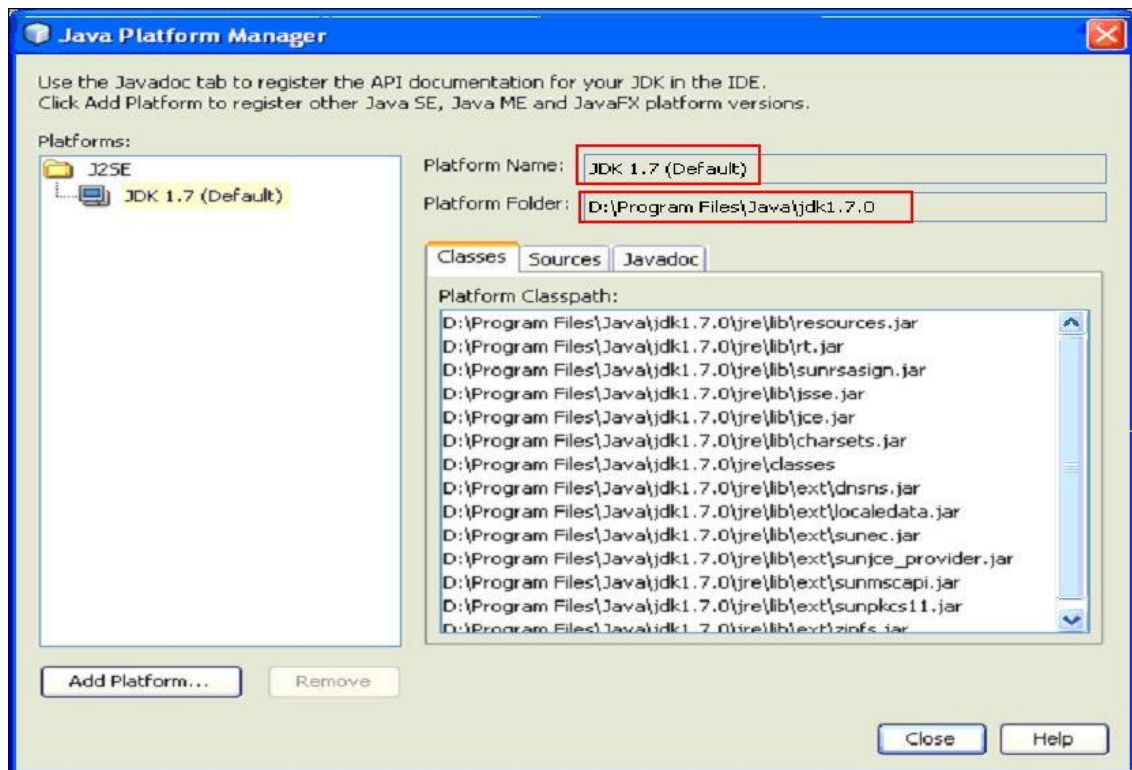
Note: NetBeans allows you to specify the lowest Java platform version with which the generated code should be compatible. For example, if you had not changed this setting to JDK 7, you would have seen error messages when using any of the core language changes included in JDK 7. NetBeans would warn you that the code would be incompatible with an earlier version.

Remember that when you compiled and ran this java file from the command prompt, you had to manually set the PATH to point to the JDK 7 installation. When you use an IDE, it automatically sets a default JDK runtime environment for each NetBeans project.

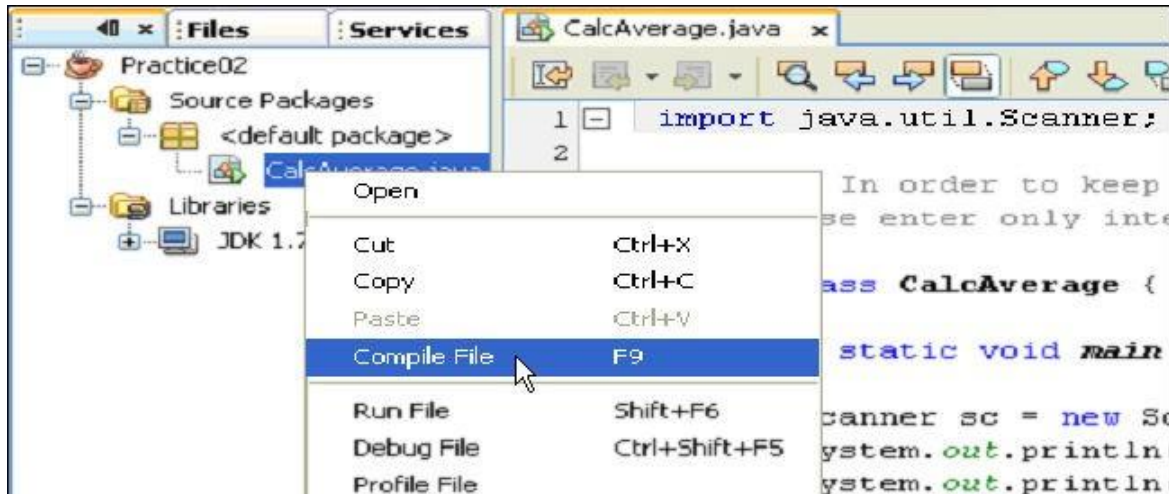
- c. Confirm that the Java Platform setting for the Practice02 project is **JDK 7**. Select the **Libraries** node in the Categories column. On the right, the JDK 7 is listed as the Java Platform for this project. Notice that you could select a different platform (JDK version) if you wished (assuming other platforms had been properly installed on this machine).



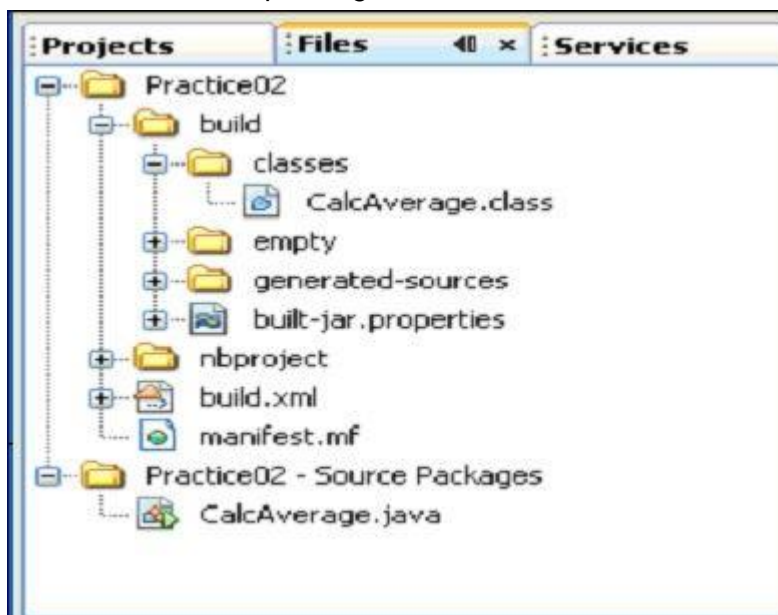
- d. Click **OK** to save the change you made in step b to the project properties.
5. To determine or change the default Java Platform for NetBeans, select **Tools > Java Platforms** on the main menu. This window shows all versions of the JDK that have been properly installed on this machine. In our case, only the JDK 7 (a.k.a. JDK 1.7) has been installed so it is marked as the “Default” platform in the Platforms column. On the right, the directory location for the JDK 7 installation is shown. Close the Java Platform Manager window when you have finished examining it.



6. To view and edit the code for the CalcAverage.java file, double click it in the Project's window. It opens in the Editor pane. Notice the color coding used by the editor. (For example, keywords are in blue, string literals are in red.) This makes working with and reading your code much easier. You learn more about using this editor in upcoming practices.
7. In the Projects window, right-click CalcAverage.java, and choose **Compile File**.

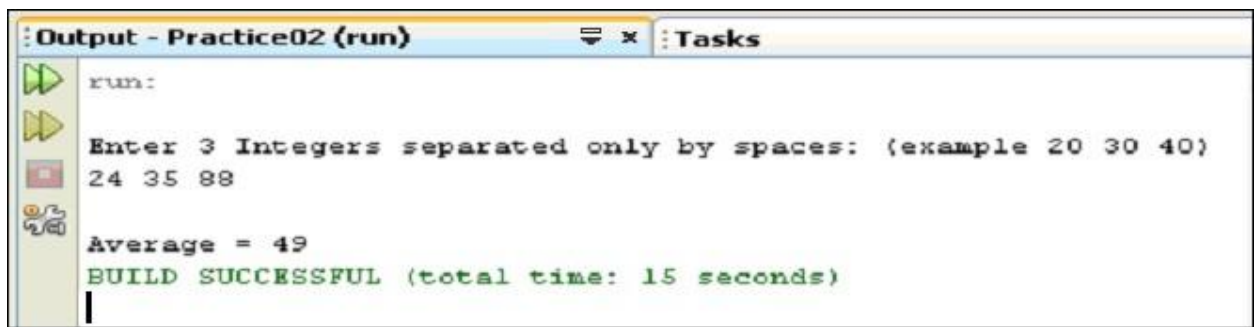


8. Assuming you had no compilation errors, you can now find the .class file by clicking the Files window and expanding **Practice02 > build > classes**.



Note: If you had made any changes to the java file, the Save button would have become enabled. By default, compilation occurs automatically with a Save.

9. Click the Projects window again. Right-click the file and choose **Run File**. The output from the program appears in the Output window. Enter the three integer values in the line beneath the output message and press Enter to see the result.



The image shows a screenshot of the NetBeans IDE's Output window. The window has a title bar that reads "Output - Practice02 (run)" and a "Tasks" tab on the right. On the left side of the window, there is a vertical toolbar with icons for running (a green play button), stepping through code (a yellow play button), stopping (a red square), and a help icon. The main text area of the window displays the following output:

```
run:
Enter 3 Integers separated only by spaces: (example 20 30 40)
24 35 88
Average = 49
BUILD SUCCESSFUL (total time: 15 seconds)
```

Now you have seen how to run a simple Java program using both the DOS command prompt and the NetBeans IDE.

10. Close the Practice02 project in NetBeans. In the Projects window, right-click Practice02 and select **Close** from the context menu.