



Java Foundations

1-3

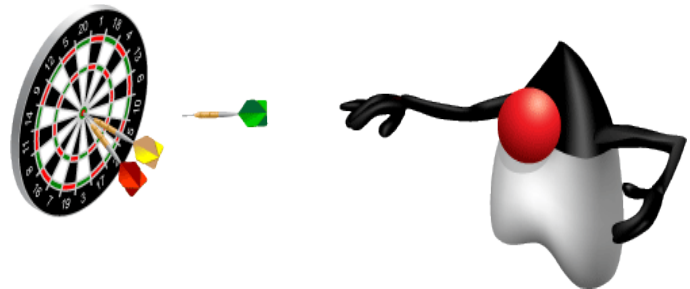
Setting Up Java



Objectives

This lesson covers the following objectives:

- Understand the difference between the JDK and JRE
- Understand the difference between `.java` and `.class` files
- Describe the purpose of an integrated development environment (IDE)
- Download and install the JDK, JRE, and NetBeans IDE
- Import a project into NetBeans



Topics

- Understanding the JRE, JDK, and NetBeans IDE
- Time to Set Up!

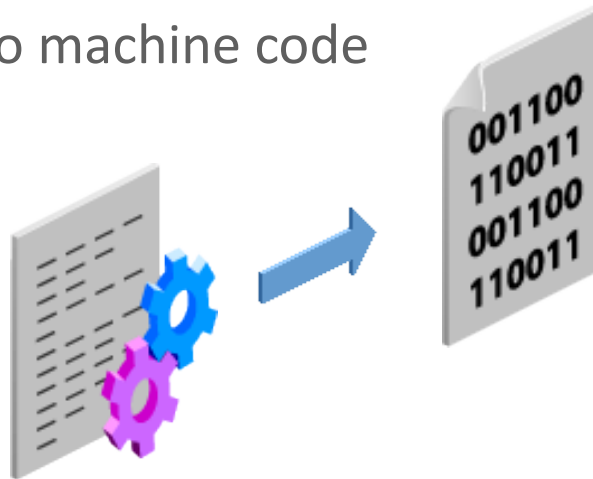


Section 1

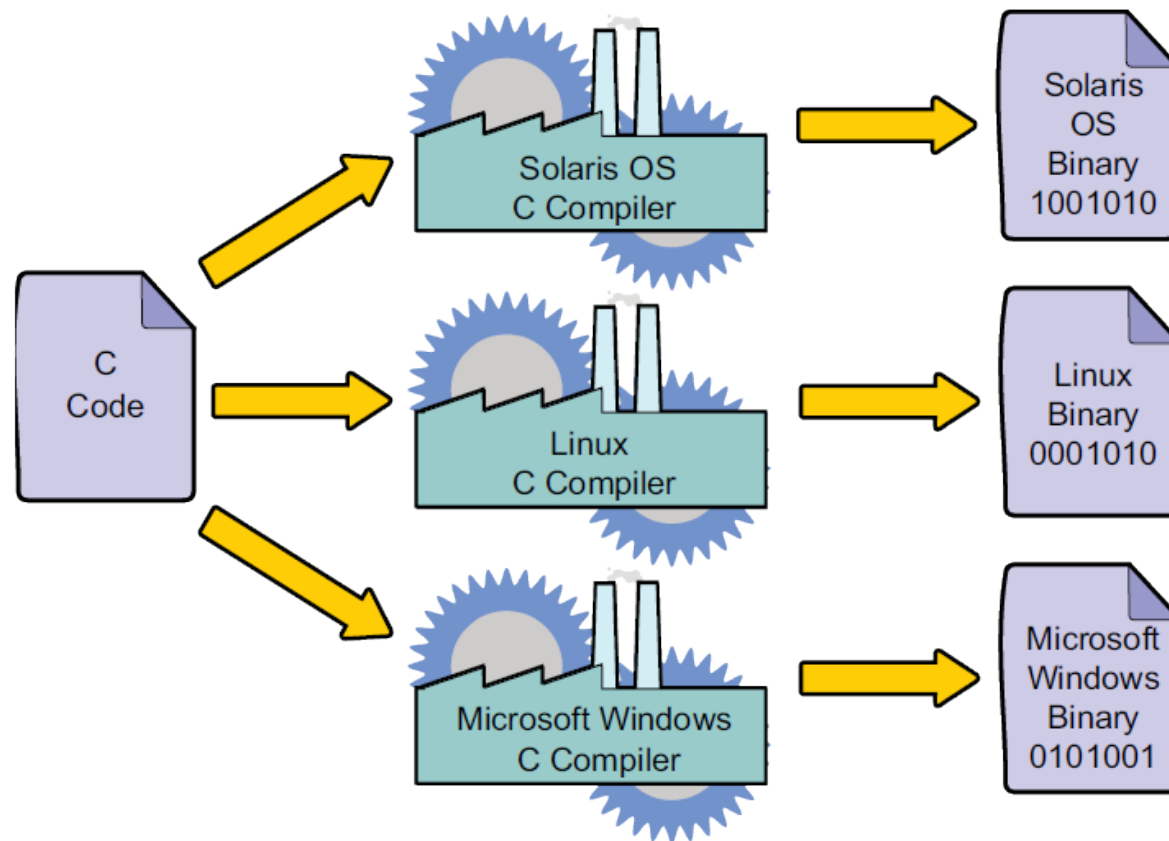
Purpose of a Computer Program

A computer program is a set of instructions that run on a computer or other digital device.

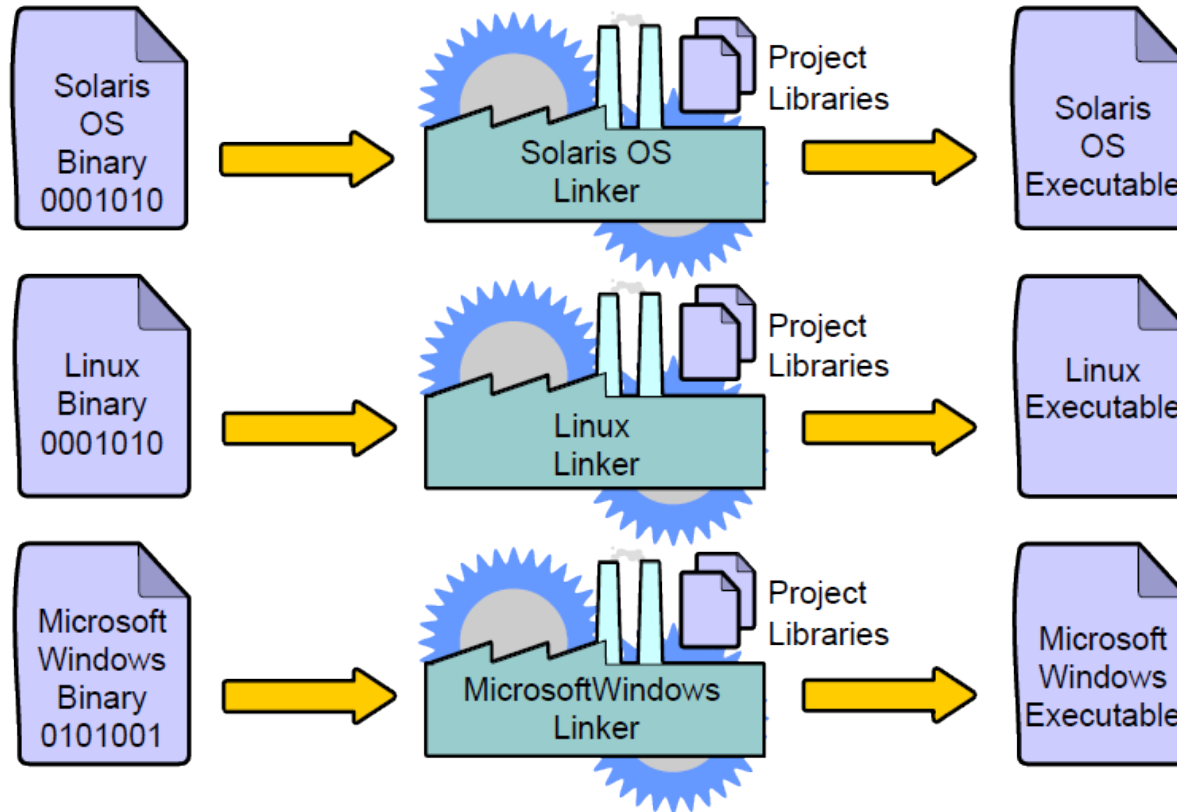
- At the machine level, the program consists of binary instructions (1s and 0s).
 - Machine code
- Most programs are written in high-level code (readable).
 - Must be translated to machine code



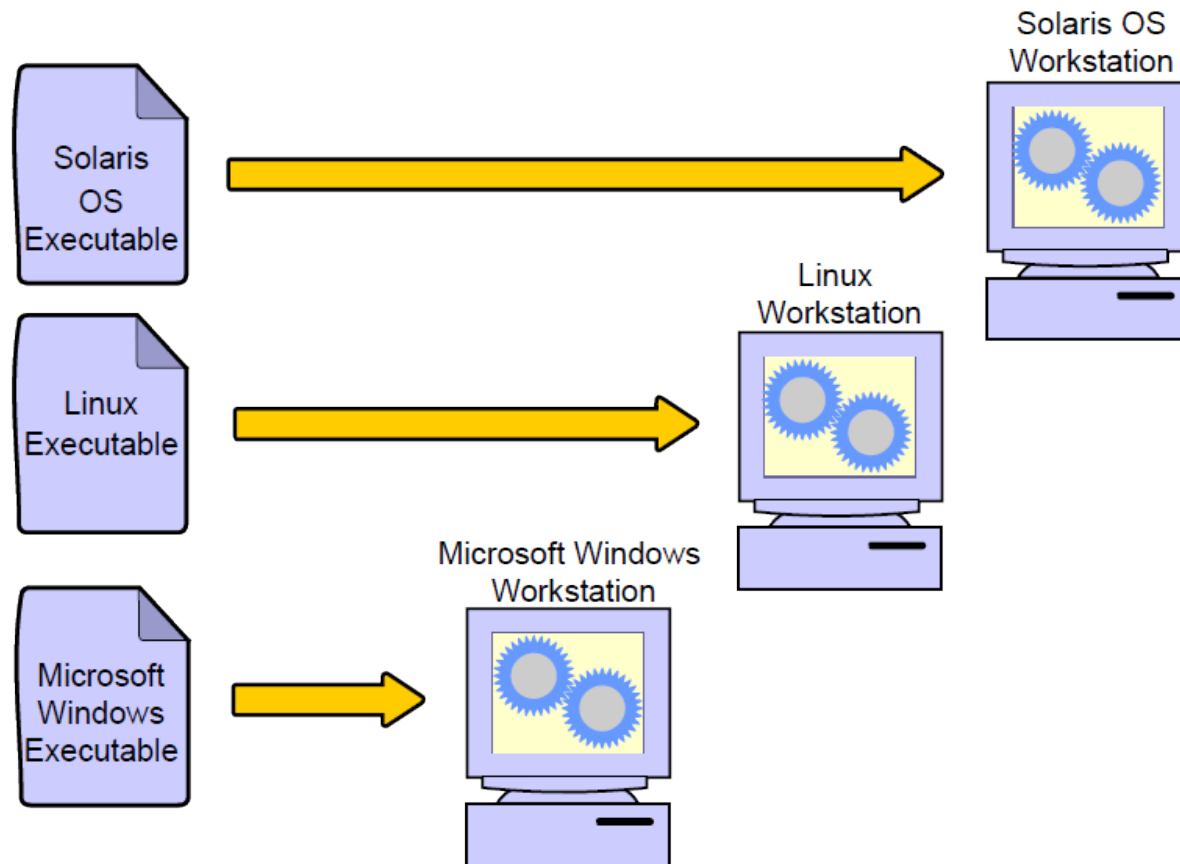
Translating High-Level Code to Machine Code



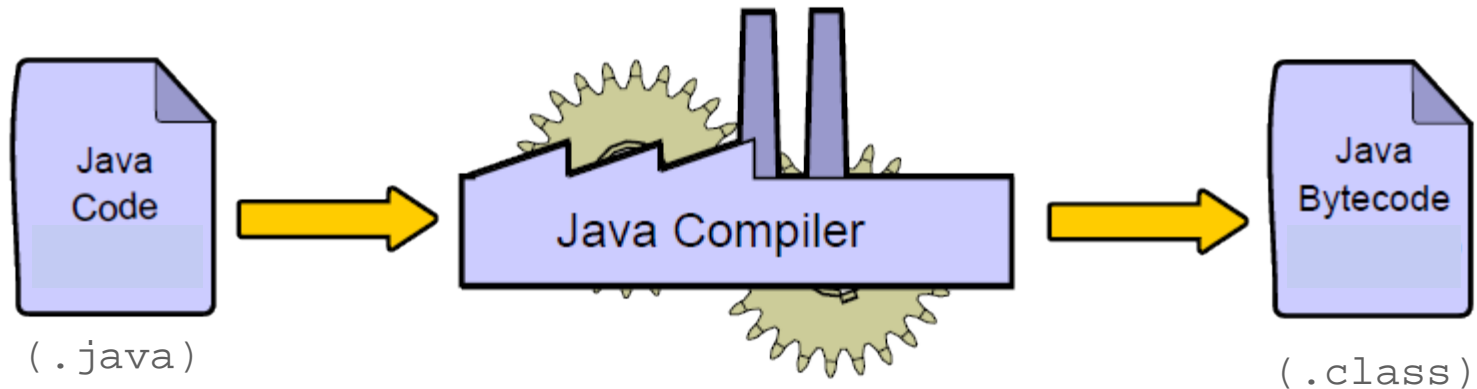
Linked to Platform-Specific Libraries



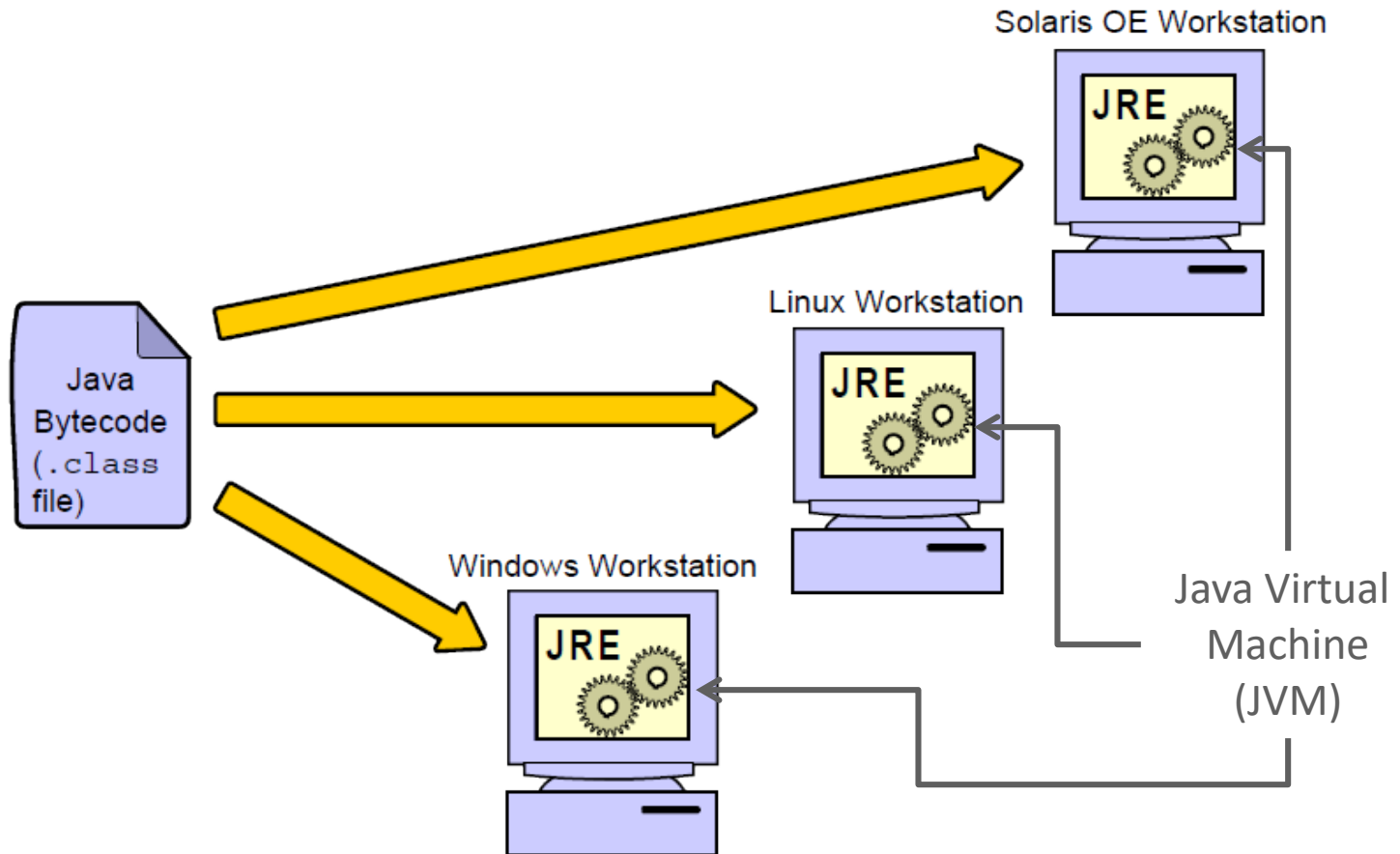
Platform-Dependent Programs



Java Is Platform-Independent



Java Programs Run in a JVM



Java Runtime Environment (JRE)




JRE

- Includes:
 - The Java Virtual Machine (JVM)
 - Java class libraries
- Purpose:
 - Read bytecode (`.class`)
 - **Run** the same bytecode anywhere with a JVM

Java Development Kit (JDK)



JDK

- Includes:
 - JRE 
 - Java Compiler
 - Additional tools
- Purpose:
 - **Compile** bytecode (`.java` → `.class`)

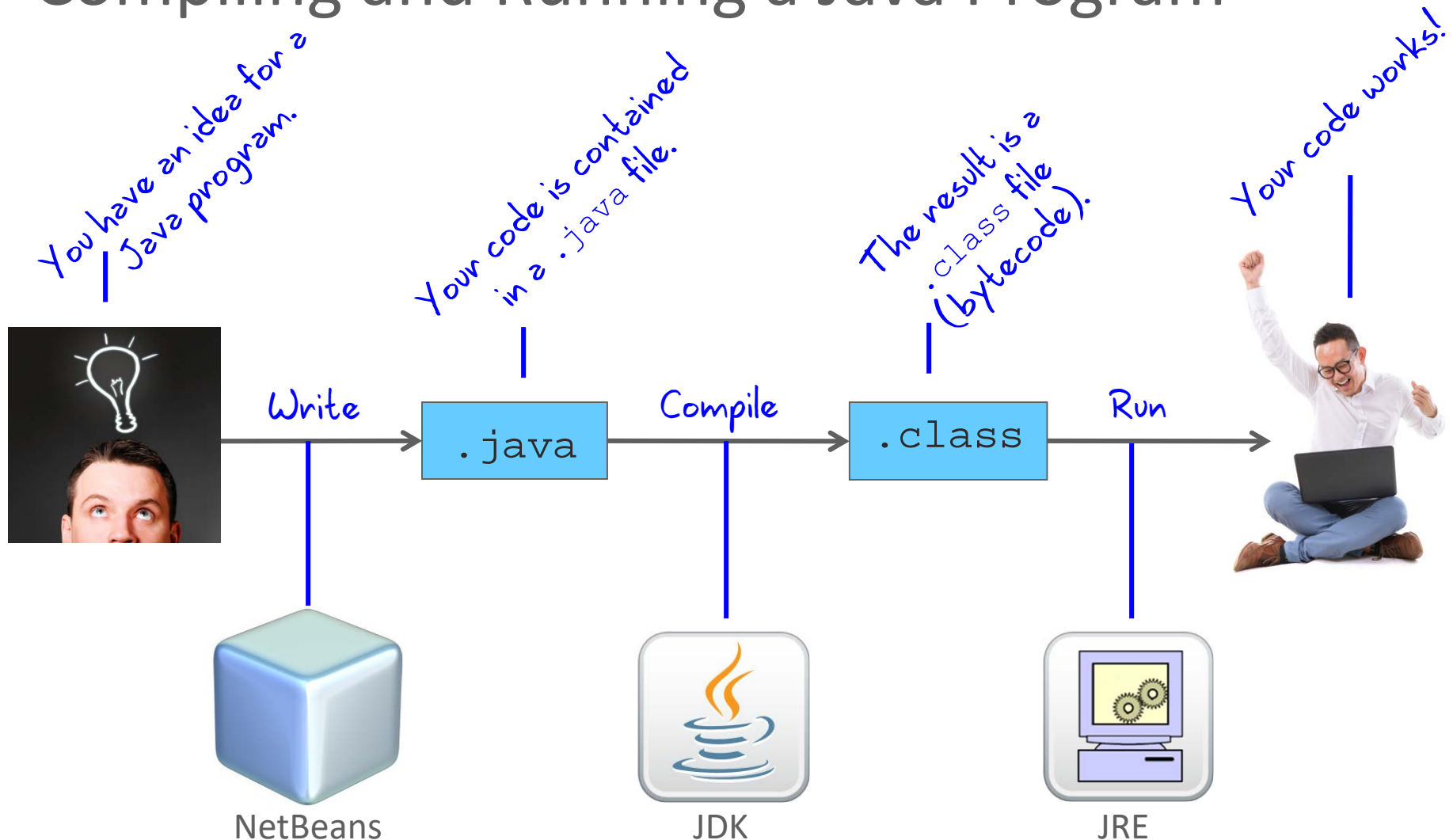
Integrated Development Environment (IDE)



NetBeans IDE

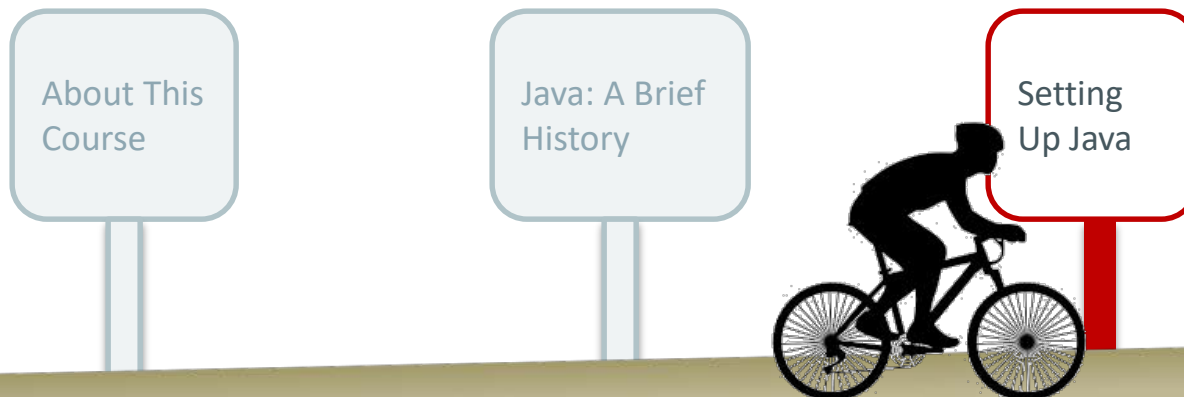
- Purpose:
 - Provide a sophisticated text editor
 - Offer assistance debugging code
 - Manage projects
 - **Write** source code (`.java`)
- Examples:
 - NetBeans
 - Greenfoot and BlueJ
 - Alice

Compiling and Running a Java Program



Topics

- Understanding the JRE, JDK and NetBeans IDE
- Time to Set Up!



Section 1

Time to Set Up!



JRE



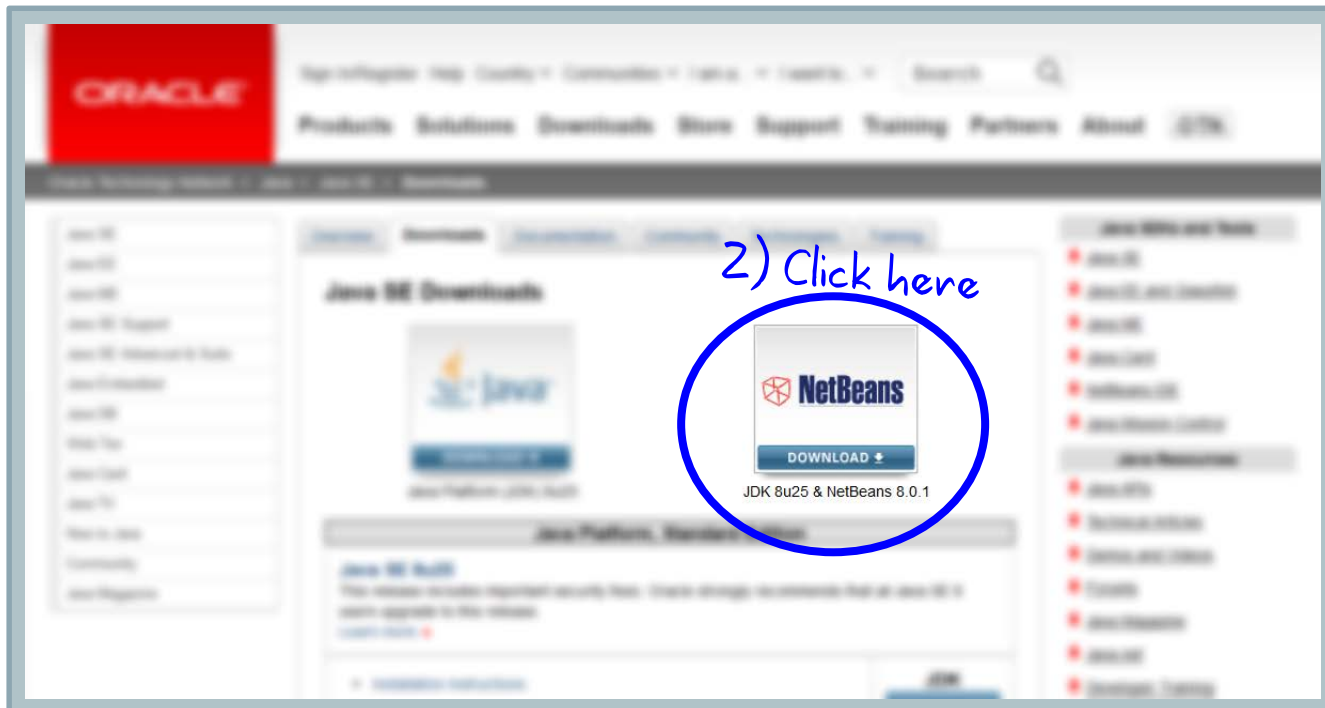
JDK



NetBeans IDE

Downloading JDK 8 & NetBeans

1. Go to the Java SE Downloads page at <http://www.oracle.com/technetwork/java/javase/downloads/index.html>.
2. Select the combined JDK & NetBeans.



Downloading JDK 8 & NetBeans

3. Accept the license agreement.
4. Select the correct download for your system.

JDK 8u25 with NetBeans 8.0.1

You must accept the JDK 8u25 and NetBeans 8.0.1 Cobundle License Agreement to download this software.

☒ Accept License Agreement ☐ Decline License Agreement

3) Click here

4) Then here

Product / File Description	File Size	Download
Linux x86	247.08 MB	jdk-8u25-nb-8_0_1-linux-i586.sh
Linux x64	243.56 MB	jdk-8u25-nb-8_0_1-linux-x64.sh
Mac OS X x64	381.18 MB	jdk-8u25-nb-8_0_1-macosx-x64.dmg
Windows x86	261.52 MB	jdk-8u25-nb-8_0_1-windows-i586.exe
Windows x64	274.73 MB	jdk-8u25-nb-8_0_1-windows-x64.exe



Installing JDK 8 & NetBeans (Windows)

1. Double-click the installer file to run the installer.
2. On the Welcome page of the installation wizard, click **Next**.
3. On the JUnit License Agreement page, decide if you want to install JUnit (Optional), select the appropriate option, and click **Next**.
4. On the JDK Installation page, specify which directory to install the JDK into, and click **Next**.



Installing JDK 8 & NetBeans (Windows)

5. On the NetBeans IDE Installation page, do the following:
 - a) Specify the directory for the NetBeans IDE installation.
 - b) Accept the default JDK installation to use with the IDE.
6. Click **Next**.
7. Review the Summary page to ensure that the software installation locations are correct.
8. Click **Install** to begin the installation.
9. On the Setup Complete page, provide anonymous usage data if wanted, and click **Finish**.



Installing JDK 8 & NetBeans (Mac)

1. After the download is completed, run the installer. The installer file has the `.dmg` extension.
2. On the panel that opens, double-click the package icon. The package has the `.mpkg` extension. The installation wizard starts.
3. On the Introduction page of the installation wizard, click **Continue**.



Installing JDK 8 & NetBeans (Mac)

4. On the Installation Type page, select the appropriate option:
 - To perform a standard installation of the Software Bundle, click **Install**, and then skip to step 7.
 - To specify another installation location, click **Change Install Location**, and then proceed to step 5.
5. On the Destination Select page, specify the disk for Software Bundle installation, and click **Continue**.



Installing JDK 8 & NetBeans (Mac)

6. On the Installation Type page, click **Install**.
7. On the Installation page, enter the administrator's name and password for your system, and click **Install Software** to begin the installation. The page displays the installation's progress.
8. When the installation is completed, click **Close** on the Summary page.



Installing JDK 8 & NetBeans (Linux)

1. Enter the following command from the directory where you placed the installation file: `./<installer-file-name>`
2. On the Welcome page of the installation wizard, click **Next**.
3. On the JUnit License Agreement page, decide if you want to install JUnit (optional), select the appropriate option, and click **Next**.
4. On the JDK Installation page, specify which directory to install the JDK into, and click **Next**.



Installing JDK 8 & NetBeans (Linux)

5. On the NetBeans IDE Installation page, do the following:
 - Specify the directory for the NetBeans IDE installation.
 - Accept the default JDK installation to use with the IDE or specify another JDK location.
6. Click **Next**.
7. Review the Summary page to ensure that the software installation locations are correct.



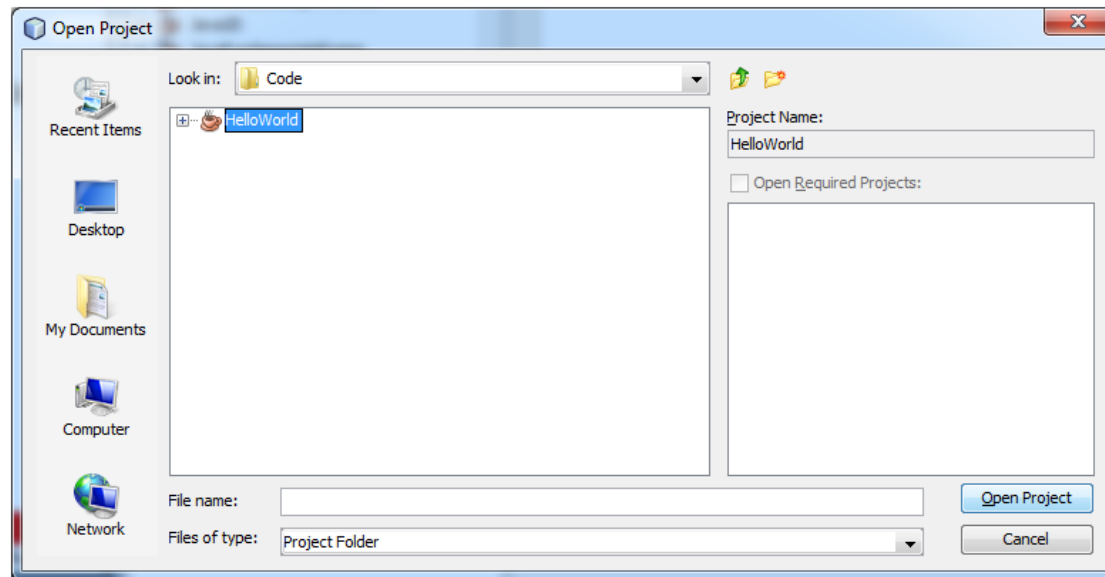
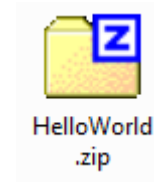
Installing JDK 8 & NetBeans (Linux)

8. Click **Install** to begin the installation.
9. On the Setup Complete page, provide anonymous usage data if wanted, and click **Finish**.

Note: If you install this bundle in a systemwide location such as `/usr/local`, you must first log on as `root` to gain the necessary permissions.

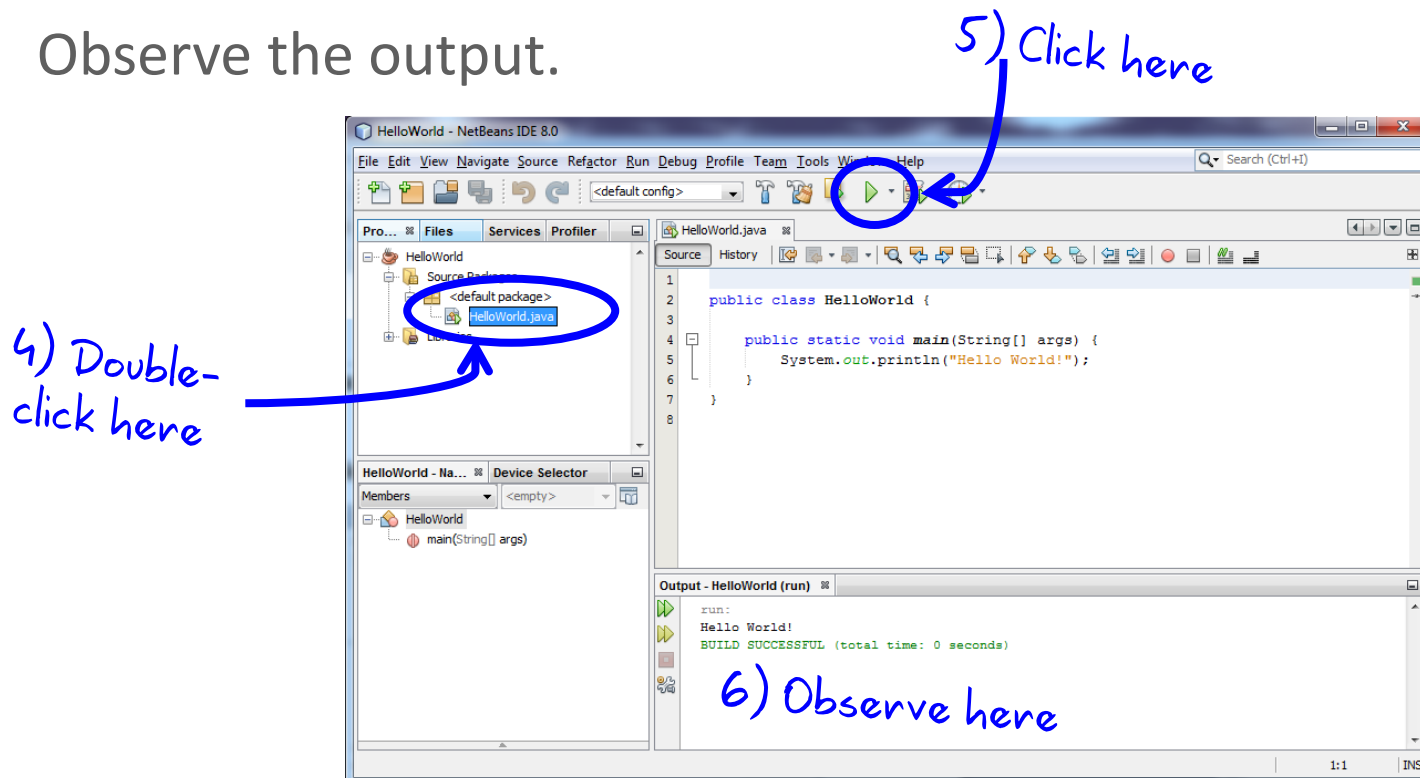
Testing NetBeans

1. Download and unzip the HelloWorld project:
2. Launch NetBeans:
3. Select **File > Open Project**, and then select **HelloWorld**.



Testing NetBeans

4. Expand the project and open HelloWorld.java.
5. Compile and run the project.
6. Observe the output.





Exercise

- Edit the code so that it prints a message other than `"Hello World!"`
 - Compile and run your code to verify that your changes work.
- Change the `'S'` in `"System"` to lowercase and try to compile it.
 - Is Java syntax case-sensitive?
- Remove the semicolon `(;)` and try to compile.
 - Is the semicolon important to Java syntax?

Summary

- A computer program is written in a high-level language, but must be compiled into machine code.
- Most programming languages compile a separate executable for each platform.
- Java is platform-independent.



An IDE like NetBeans is used to **write** source code (`.java`).



The JDK **compiles** bytecode (`.java` → `.class`).



Bytecode **runs** in a JVM, which is part of the JRE.

Summary

In this lesson, you should have learned how to:

- Understand the difference between the JDK and JRE
- Understand the difference between `.java` and `.class` files
- Describe the purpose of an IDE
- Download and install the JDK, JRE, and NetBeans IDE
- Import a project into NetBeans

