

## Introduction to Computer Programming (Java A)

### Lab 1

#### [Objectives]

1. Install JDK 8 and configure environment variable.
2. Learn compilation and execution of your first Java program in command line.

#### [Course Information]

1. **Lab exercise:** The content of lab exercise is prepared according to the knowledge introduced in lectures. Normally, we provide 3 to 7 exercises per lab.
2. **Assignment:** The assignment is independent from the lab exercise and will be sent to you separately. All of you should submit the assignment before the deadline. There will be about 5 assignments in this course.

#### **Submission of Assignment:**

We will use an Online Judge (OJ) platform to automatically grade your programming assignments. More instructions will be given later.

#### 3. **Grading Scheme:**

Lecture attendance and quizzes (5%)

Lab attendance and exercise (5%)

Assignments (30%)

Project (20%)

Final exam (40%)

4. **Project:** Before the end of this semester, all of you should accomplish a project. The number of group members is 2-3.

#### [Software Installation]

1. **JDK:** The Java Development Kit (JDK) is a software development environment for developing Java applications and applets. It includes a Java Runtime Environment (JRE), an interpreter/loader (java), a compiler (javac), an archiver (jar), a documentation generator (javadoc) and other tools needed in Java development.

Download JDK at the following url:

<https://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>

| Java SE Development Kit 8u201   |           |   |
|---|-----------|---|
| You must accept the <a href="#">Oracle Binary Code License Agreement for Java SE</a> to download this software. |           |   |
| <input type="radio"/> Accept License Agreement <input checked="" type="radio"/> Decline License Agreement       |           |   |
| Product / File Description  | File Size | Download  |
| Linux ARM 32 Hard Float ABI   | 72.98 MB  | <a href="#">jdk-8u201-linux-arm32-vfp-hflt.tar.gz</a> |
| Linux ARM 64 Hard Float ABI   | 69.92 MB  | <a href="#">jdk-8u201-linux-arm64-vfp-hflt.tar.gz</a> |
| Linux x86   | 170.98 MB | <a href="#">jdk-8u201-linux-i586.rpm</a>              |
| Linux x86   | 185.77 MB | <a href="#">jdk-8u201-linux-i586.tar.gz</a>           |
| Linux x64   | 168.05 MB | <a href="#">jdk-8u201-linux-x64.rpm</a>               |
| Linux x64   | 182.93 MB | <a href="#">jdk-8u201-linux-x64.tar.gz</a>            |
| Mac OS X x64  | 245.92 MB | <a href="#">jdk-8u201-macosx-x64.dmg</a>              |
| Solaris SPARC 64-bit (SVR4 package)   | 125.33 MB | <a href="#">jdk-8u201-solaris-sparcv9.tar.Z</a>       |
| Solaris SPARC 64-bit  | 88.31 MB  | <a href="#">jdk-8u201-solaris-sparcv9.tar.gz</a>      |
| Solaris x64 (SVR4 package)  | 133.99 MB | <a href="#">jdk-8u201-solaris-x64.tar.Z</a>           |
| Solaris x64   | 92.16 MB  | <a href="#">jdk-8u201-solaris-x64.tar.gz</a>          |
| Windows x86   | 197.66 MB | <a href="#">jdk-8u201-windows-i586.exe</a>            |
| Windows x64   | 207.46 MB | <a href="#">jdk-8u201-windows-x64.exe</a>             |

**Note:** The version of JDK provided at the above link may be newer than 8u201. This does not matter.

### Installation:

Once downloaded, run the executable. Follow the prompts to install the JDK. You'll need administrator access.

- a) Double click the JDK Software, and install it according to the prompt.



Today's exercise is designed to make sure that the Java programming environment is correctly installed on your machine.

Open a terminal window or command prompt. In Windows 7 or newer, Start Menu | All Programs | Accessories | Command Prompt, or type "cmd" at the search box. Type the following command:

```
java -version
```

Then if it returns as following, you have installed it successfully.

```
C:\Program Files\Java\jdk1.8.0_201\bin>java -version
java version "1.8.0_201"
Java(TM) SE Runtime Environment (build 1.8.0_201-b09)
Java HotSpot(TM) Client VM (build 25.201-b09, mixed mode, sharing)
```

## 2. Java Environment Variable:

If you are a Mac OS user, you can ignore environment variable in this lab.

If you are a Windows user, you need to do as following steps.

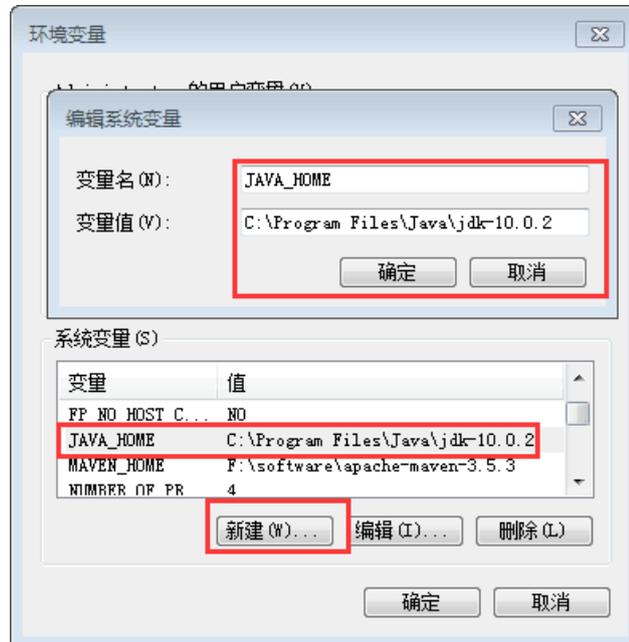
- Advanced System Settings: Type **advanced system settings** (高级系统设置) in the search box (beside the Windows start button), clicks **View**

**advanced system settings**.

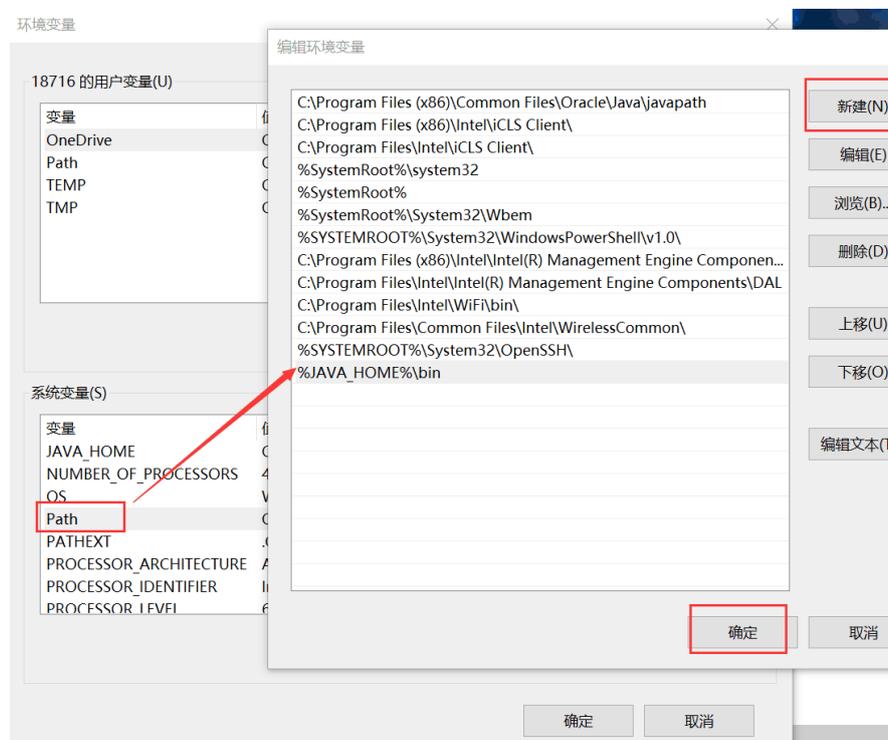


- b) Add JAVA\_HOME: In System variables, add a new JAVA\_HOME variable and point it to the JDK installed folder.

(The following picture assumes JDK 10 is installed, find your equivalent JDK 8 folder)



- c) Update Path: In System variables, find PATH, click edit and append this %JAVA\_HOME%\bin into the last line (Windows 10 user).



- d) Restart your command prompt.
- e) Checking.

Then type the command below:

**javac -version**

You will see one of two things. If the JDK / Java compiler is correctly installed, you should see a version number like so:

```
C:\Program Files\Java\jdk1.8.0_201\bin>javac -version
javac 1.8.0_201
```

However, if the JDK isn't installed or the environment variables are not properly configured, then you'll see an error like so:

```
C:\>javac -version
'javac' is not recognized as an internal or external command,
operable program or batch file.
```

### 3. Editor

A simple editor **Notepad++** is recommended for beginners (For windows system user). For Mac users, **Visual Studio Code** is a good option.

Download Notepad++: <https://notepad-plus-plus.org/>

Download Visual Studio Code: <https://code.visualstudio.com/>

Or, you can simply use any text editor (the source code of Java programs is just a sequence of characters), for example **notepad** on windows and **TextEdit** on Mac.

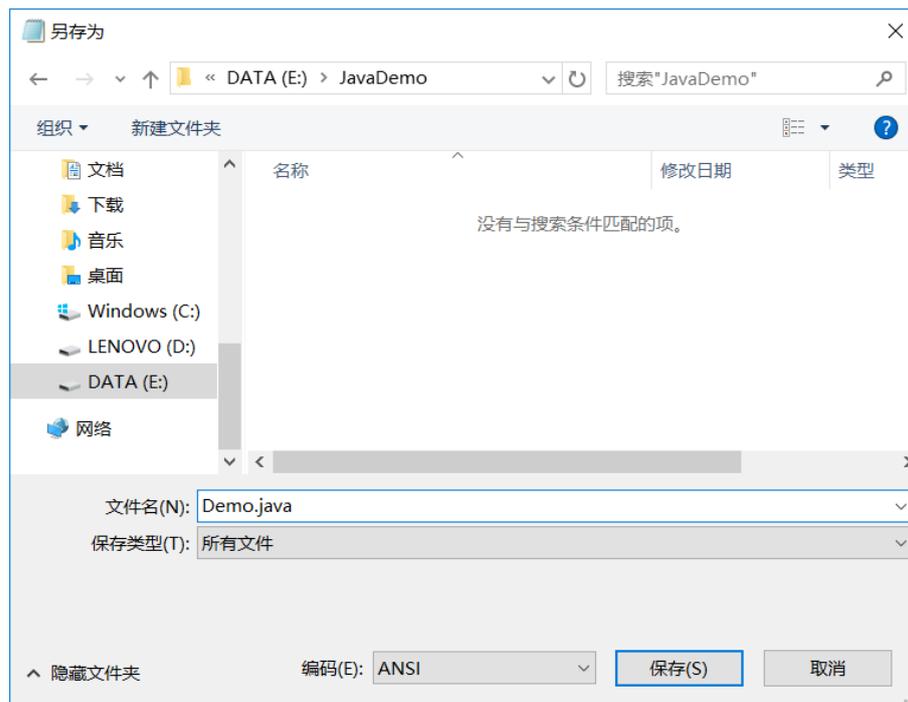
## [Exercise]

### 1. Compile a Java Program in CMD

(1) Open **notepad** and create a new text file and type the following code.

```
public class Demo {
    public static void main(String[] args) {
        System.out.println("Hello, world!");
    }
}
```

(2) Using the “save as” command in the “File” menu to save the file with the name “Demo.java”. Note that the .java file name has to be the same as the main Class name in your program.



In this lab, you are using an editor and the compiler separately. There are software products (e.g. Eclipse, NetBeans, IDEA) that could link them up and facilitate your work. In this semester, you are recommended to use IDEA. You can download the community version at the following link:

<https://www.jetbrains.com/idea/download/>

More detailed introductions of how to use IDEA will be introduced in future labs.