Nand2Tetris Setup Guide for Apple MacOS

This guide describes how to install and run the Nand2Tetris software suite on Apple MacOS.

Install Java

Older versions of Apple MacOS come with Java pre-installed, so there may be no need to install Java on your Mac. Furthermore, there is no need to modify your Java CLASSPATH.

To find out if Java is already installed on your Mac, start the Terminal application (Applications - Utilities - Terminal). Once the terminal window appears, type the following:

```
java -version
```

Depending on what happens next, you may or may not need to install Java.

- If you see an output on the console such as `java version "1.8.0_31"`, then Java is already installed. You can proceed to install the Nand2Tetris software suite.
- If a window appears, stating *To use the "java" command-line tool you need to install a JDK*, then click the *More Info...* button. A web page will open, and you should follow the instructions to download and install Java.

After installing Java, verify the installation by starting a new Terminal window and typing `java -version`. You should see something like `java version "1.8.0_31"`.

Install the Nand2Tetris Software Suite

Double-click the .zip file you've downloaded from the Software page in the Nand2Tetris web site. MacOS will automatically extract the contents of the .zip file to a folder. Move this folder to your desktop.

To run any one of the Nand2Tetris tools on MacOS, you must use the command line. Start the Terminal application (Applications - Utilities - Terminal). Once the terminal window appears, type the following:

```
~/Desktop/nand2tetris/tools/HardwareSimulator.sh
```

(The first character, called a "tilde," is located to the left of the number `1` key on most keyboards.) At this point, the supplied *Hardware Simulator* should started running in a new window.

From now on, when you wish to run the supplied *Hardware Simulator*, simply execute the command shown above.

All the supplied *Nand2Tetris* software tools are started in a similar way: just replace `HardwareSimulator` with the name of the software tool you wish to run.

Tool	Command
Hardware Simulator	`HardwareSimulator.sh`
CPU Emulator	`CPUEmulator.sh`
Assembler	`Assembler.sh`
VM Emulator	`VMEmulator.sh`
Jack Compiler	`JackCompiler.sh`

To run any of these tools, open a Terminal window and type the following, replacing `COMMAND` with one of the commands listed above.

```
~/Desktop/nand2tetris/tools/COMMAND
```

That's a lot to type. Can I shorten this?

Indeed you can. Open a Terminal window and type (*once and for all*):

```
echo "export PATH=$PATH:~/Desktop/nand2tetris/tools" >> ~/.bash_profile ;
source ~/.bash_profile
```

If you are running MacOS Catalina or newer, use the following command instead. Type (*once and for all*):

```
echo "export PATH=$PATH:~/Desktop/nand2tetris/tools" >> ~/.zshrc ; source ~/.
zshrc
```

You can now run any of the supplied *Nand2Tetris* software tools by typing just the command. For example:

```
HardwareSimulator.sh
```

I'm Working on Project 9. How Do I Compile My `.jack` Files?

Unlike the simulators, which feature an interactive user interface, the Jack Compiler is a terminal-oriented application. In order to run it, you must supply the name of the file or folder that you wish to compile. For example, suppose you wish to compile all the `.jack` files stored in the folder `projects/09/Square` (that's a folder called `Square`, located in the `09` folder, which is located in the `projects` folder). To do so, open a Terminal window and type:

```
JackCompiler.sh ~/Desktop/nand2tetris/projects/09/Square
```

This results in either a successful compilation of the `.jack` files in `Square`, or some compilation errors.

Why Am I Seeing a "Command Not Found" Message?

The likely reason is that your folder location is not on the MacOS desktop, which is assumed by the instructions above. Replace `Desktop` above with the correct path to your `nand2tetris/tools` folder, or move your `nand2tetris` folder to your desktop.