

- In the following sections, lines which start with the \$ symbol denote commands that **must be** run in the terminal, and lines which start with the # symbol denote comments, which **must not be** run.
- When you run the commands, do **not** copy-paste the commands into the terminal; type them out instead, without including the \$ symbol.

1 Setup On Ubuntu Linux

1. Launch a terminal and run the following commands.

```
>_ ~/
# Change to your home folder.
$ cd $HOME
# Install OpenJDK, ant, and spim.
$ sudo apt-get install openjdk-17-jdk ant spim
# Create workspace folder.
$ mkdir workspace
# Set the j environment variable.
$ echo "export j=$HOME/workspace" >> $HOME/.bashrc
```

2. Download and install IntelliJ (Community Edition) [↗](#).

2 Setup On Mac OS X

1. Launch a terminal and run the following commands.

```
>_ ~/
# Change to your home folder.
$ cd $HOME
# Install brew.
$ /bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"
# Install OpenJDK.
$ brew install openjdk@17
# Install ant.
$ brew install ant
# Install spim.
$ brew install spim
# Create workspace folder.
$ mkdir workspace
# Set the j environment variable.
$ echo "export j=$HOME/workspace" >> $HOME/.bash_profile
# Change your shell to bash.
$ chsh -s /bin/bash
```

2. Download and install IntelliJ (Community Edition) [↗](#). Launch IntelliJ, go to *Configure* → *Settings* → *Tools* → *Terminal* and set *Shell path* to */bin/bash*.

3 Setup On Windows

1. Launch a powershell terminal and run the following commands.

```
>_ ~/
# Change to your home folder.
$ cd $HOME
# Create workspace folder.
$ mkdir workspace
# Set the j environment variable.
$ setx j "$env:PATH;$HOME\workspace"
```

2. Download and unzip OpenJDK 17 [🔗](#) for Windows under some folder *xyz*.

```
>_ ~/
# Set the JAVA_HOME environment variable.
$ setx JAVA_HOME "%env:PATH;XYZ\bin"
# Update the PATH environment variable.
$ setx PATH "%env:PATH;XYZ\bin"
```

3. Download and unzip Ant [🔗](#) under some folder *xyz*.

```
>_ ~/
# Update environment variable PATH to point to the XYZ\bin folder.
$ setx PATH "%env:PATH;XYZ\bin"
```

4. Download and install SPIM [🔗](#).
5. Download and install IntelliJ (Community Edition) [🔗](#). Launch IntelliJ, go to *Configure* → *Settings* → *Tools* → *Terminal* and set *Shell path* to powershell.

4 Testing the Environment

To test if your environment is setup correctly, download and unzip <https://www.cs.umb.edu/j--/j--.zip> under `~/workspace`, launch IntelliJ and open `~/workspace/j--`, and run the following commands on the IntelliJ terminal.

```
>_ ~/workspace/j--
$ ant
$ bash ./bin/j-- tests/jvm/HelloWorld.java
$ java HelloWorld
$ bash ./bin/j-- -s naive tests/spim/HelloWorld.java
$ spim -f HelloWorld.s
```

5 FAQ

- Q1. I get a “LinkageError” on Mac OS X when I try to run `j--`. What do I do?

Answer: It is because the version of `javac` used by Ant is incompatible with the version of `java` used by `j--`. Run the following command to fix the issue.

```
>_ ~/
# Set the JAVA_HOME environment variable to point to JDK 17.
$ echo "export JAVA_HOME=/usr/libexec/java_home -v 17" >> $HOME/.bash_profile
```

- Q2. What do I do if I get a “Project JDK is not defined” message when I open a Java program in IntelliJ?

Answer: Click on “Setup SDK” and select OpenJDK 17 available under “Detected SDKs”.

- Q3. How do I tell IntelliJ to automatically wrap lines at 100 columns and enable visual guides at 80 and 100 columns?

Answer: Go to *File* → *Settings* → *Editor* → *Code Style*, set “Hard wrap at” to 100, enable “Wrap on typing”, and set “Visual guides” to 80, 100.

- Q4. How do I tell IntelliJ to assign each parameter or variable its own color?

Answer: Go to *File* → *Settings* → *Editor* → *Color Scheme* → *Language Defaults* → *Semantic highlighting*, and enable it.