CSE 8B: Introduction to Programming and Computational Problem Solving - 2

Assignment 1

Getting Started with CSE 8B

Due: Wednesday, April 12, 11:59 PM

Learning goals:

- Certify your commencement of academic activity in CSE 8B
- Configure a remote Linux environment
- Affirm your commitment to upholding academic integrity in CSE 8B
- Learn basic CLI commands that manipulate files/directories.
- Install Java 11
- Install the Visual Studio Code
- Write and compile a simple Java program
- Submit files to Gradescope

NOTE: This programming assignment must be done individually. Pair programming is NOT allowed for this assignment.

Part 0: Prior knowledge + certification of commencement of academic activity (0 points)

Beginning this past summer, for every course at UC San Diego, per the US Department of Education, we are **required** to certify whether students have commenced academic activity for a class to count towards eligibility for Title IV federal financial aid. This certification must be completed during the first two weeks of instruction.

For CSE 8B, this requirement will be fulfilled via an **ungraded** prior knowledge quiz, which will assist the instructional team by providing information about your background prior to the course.

Complete this quiz in Canvas by going to the CSE 8B course and navigating to Quizzes. Then click "First Day Survey: Prior Knowledge #FinAid" and complete the quiz.

Part 1: Setting up UCSD Linux Cloud (0 points, optional)

This part is necessary if you prefer to write your programming assignments in a remote Linux environment with JDK 11 already installed. **Even if you prefer to configure a personal computer for Java development (instructions below), you should become familiar with UCSD Linux Cloud in case you encounter issues with a personal computer.**

UCSD Linux Cloud

Instead of having to set up JDK 11 on your computer, you will be accessing a remote instance of the Linux operating system from your regular web browser (e.g., Chrome, Safari, Edge). It also means you can access your personal Linux Cloud environment regardless of which computer you are working with!

Account Lookup

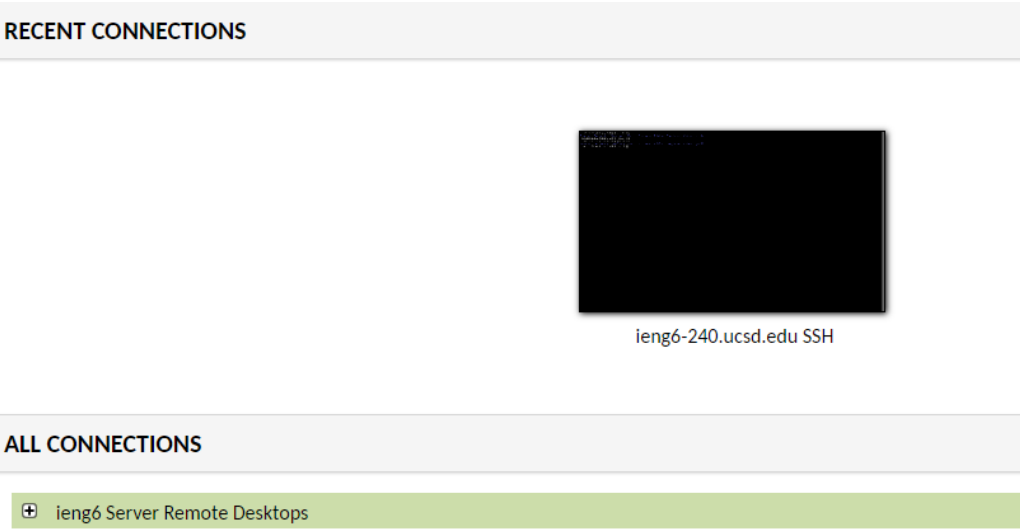
First, find your Username and Password specific to CSE 8B on the UCSD Account Lookup Tool. For the Username field on the Lookup Tool, please input your general UCSD username (the part of your email before “@ucsd.edu”). Find the account with a Username that starts with something like “**cs8bsp23**”.

Duo Registration

Next, use the Username and Password you received for your CSE 8B account to set up Duo Authentication for when you log in on the Linux Cloud. Please do so here.

Linux Cloud

Access Linux Cloud by logging in with your CSE 8B account credentials. It will then request Duo authentication on your other device. Next, open the remote Linux Desktop by selecting “ieng6 Server Remote Desktops.”



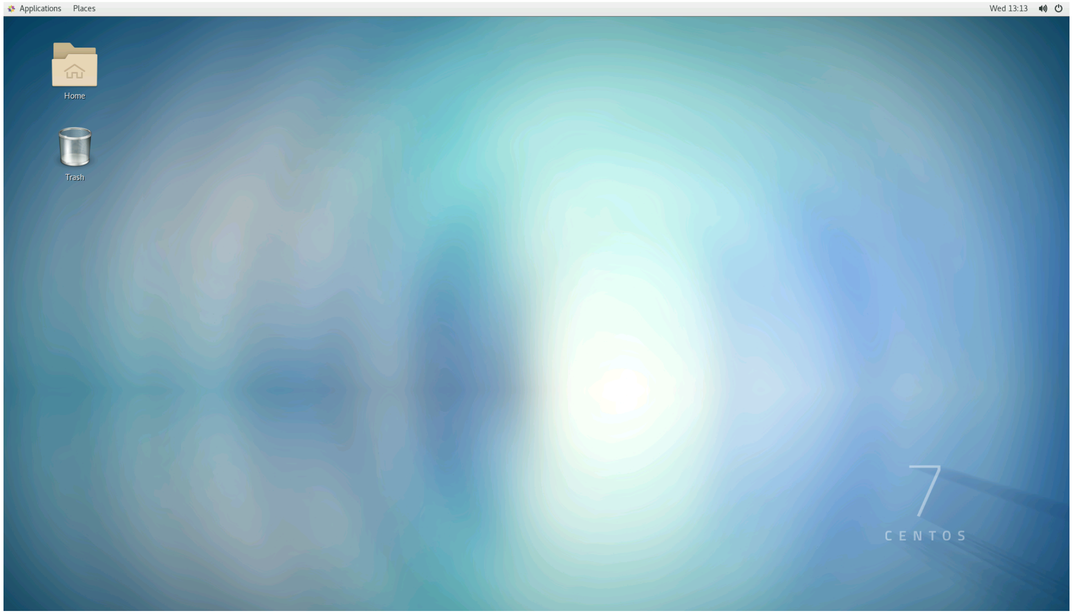
RECENT CONNECTIONS

ieng6-240.ucsd.edu SSH

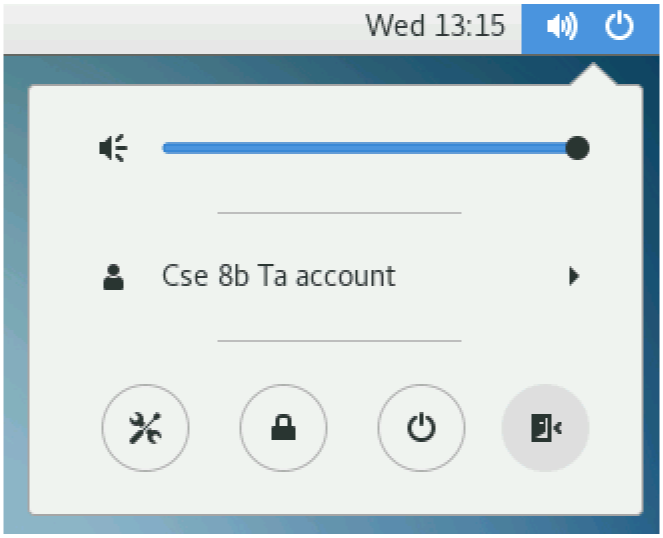
ALL CONNECTIONS

⊞ ieng6 Server Remote Desktops

Now, you should have a remote Linux Desktop (it may take some time to load) in your web browser that looks similar to this:



When you are finished using Linux Cloud, please ensure you **log out** of your remote desktop environment, **DO NOT just close your browser** window or tab. To log out, click the power button in the top right-hand corner. Then, select the fourth button with the open door.



After you press it, it will prompt you to log off. If you do not log off, Linux Cloud may not let you back in when you later want or need to!

Part 2: Academic Integrity (0 points)

The CSE department supports the fundamental values of academic integrity: honesty, respect, responsibility, fairness, trustworthiness, and courage. Unlike courses from most other departments, you are required to submit code, and there are specific programming qualifications you need to know before you write any code. Most of the time, students violate academic integrity just because they don't know it is a violation. The below tutorial is your one-stop shop of academic integrity to avoid such situations.

To complete Part 1 of this assignment:

1. Carefully read both the collaboration policy and academic integrity policy for this course, which is found in the syllabus.
2. Please watch the Source Code Plagiarism tutorial thoroughly.
3. After you finish watching the tutorial, you must complete the CSE Integrity of Scholarship Agreement. By signing this, you acknowledge that you have completed and understood the tutorial as well as the agreement. **Although this part of the assignment is worth 0 points, if you do not complete the CSE Integrity of Scholarship Agreement, then you will receive an F in the course.**

Part 3: Command-Line Navigation (0 points)

Although this part of the assignment is worth 0 points, basic command-line navigation is required in CSE 8B and related questions will appear on the exams, so you should complete this part.

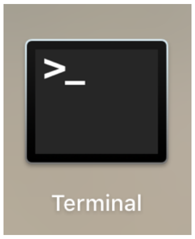
Now, let us introduce you to the command line interface (CLI)! You might have seen programmers using a black window and typing commands on it. That is the command-line interface, and every programmer uses it. Throughout this quarter, you will be using the command-line interface to navigate, compile, and run your program for all assignments. It has many names, such as **cmd, CLI, console, or terminal.**

Open the CLI

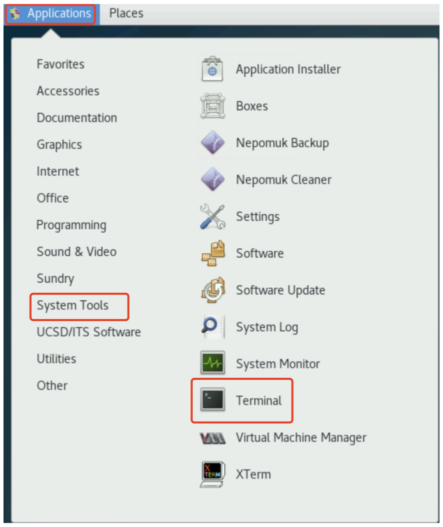
First, let's open the CLI.

- Windows: Depending on your version of Windows and your keyboard, one of the following should open a command window (you may have to experiment a bit, but you don't have to try all of these suggestions):
    - Go to the Start menu or screen, and enter "Command Prompt" in the search field.
    - Go to the Start menu → Windows System → Command Prompt.
    - Go to the Start menu → All Programs → Accessories → Command Prompt.
    - Go to the Start screen, hover your mouse in the lower-left corner of the screen, and click the down arrow that appears (on a touch screen, instead flick up from the bottom of the screen). The Apps page should open. Click on Command Prompt in the Windows System section.
    - Hold the special Windows key on your keyboard and press the "X" key. Choose "Command Prompt" from the pop-up menu.
    - Hold the Windows key and press the "R" key to get a "Run" window. Type "cmd" in the box, and click the OK key.
    - **Note:** do **not** utilize Windows PowerShell. For the scope of this assignment, PowerShell has some differences that may unnecessarily complicate things.

- macOS:
    - Go to Applications → Utilities → Terminal.
    - Or you can Search “Terminal” in the Spotlight Search bar.



- Linux: We’re using UCSD Linux Cloud as an example. You can find it under Applications → System Tools → Terminal. (Picture next page for your reference)



Command Prompt

Now you should see a black or white window that is waiting for your command.

- macOS : you probably will see a $ or % on your current line.
- Windows: you probably will see a > on your current line.

Also, there might be something like C:\Users\name or name@MacBook before the above characters. This is totally fine.

IMPORTANT: Each of the commands below will be typed to the right of the command prompt. Do not type command prompt $, % , or > before the command! The command prompt is not part of the command!

Your first command

Now let’s type the following command, no matter which OS you are using. Keep in mind that you should only type the command, not the command prompt before it.

- macOS:

```
$ whoami
```

- Windows:

```
> whoami
```

Then hit enter. And you can see your username appear.

- macOS:

```
$ whoami
myusername
```

- Windows:

```
> whoami
computername\myusername
```

Current directory

If you want to know where you are right now, or the full path of your current directory, you can try the following commands.

- macOS:

```
$ pwd
/home/linux/ieng6/cs8bsp23/myusername
```

“pwd” stands for “print working directory”. The above result is from UCSD Linux Cloud.

- Windows:

```
> cd
```

```
C:\Users\myusername
```

“cd” stands for “change directory”. The above result is from a Windows machine.

List files and directory

If you want to know what is in your current directory, you can try the following commands.

- macOS:

```
$ ls
Desktop    Downloads    Pictures    Templates    ...
```

- Windows:

```
> dir
 Directory of C:\Users\myusername
04/01/2023 07:28 PM <DIR>      Applications
04/01/2023 07:28 PM <DIR>      Desktop
04/01/2023 07:28 PM <DIR>      Downloads
04/01/2023 07:28 PM <DIR>      Music
...
```

Change current directory

Now let’s go to our Desktop directory.

- macOS:

```
$ cd Desktop
```

- Windows:

```
> cd Desktop
```

If you want to check whether you have successfully changed the directory, use the “pwd” or “cd” command we mentioned above to check your current directory after changing.

Create directory

It would be nice if you can create a CSE 8B directory on your desktop for file management.

- macOS:

```
$ mkdir cse8b
```

- Windows:

```
> mkdir cse8b
```

If you want to check whether you have successfully created the directory, use the “ls” or “dir” command we mentioned above to check your current directory’s content.

Practice time!

Based on the above tutorial, please create a new directory named to_be_deleted inside of **cse8b**, then change your current directory to the **to_be_deleted** directory. Refer to the above commands: “mkdir” to create a directory and “cd” to change directory.

Create a Java file

Now that we’re inside the to_be_deleted directory, we want to create an empty java file named test.java. Here’s what we should do.

- macOS:

```
$ touch test.java
```

- Windows:

```
> type nul > test.java
```

If you want to check whether you have successfully created the file, use the “ls” or “dir” command we mentioned above to check your current directory’s content.

Delete a file/directory

Before we delete anything, let’s try to go back to the cse8b directory.

- macOS:

```
$ cd ..
```

- Windows:

```
> cd ..
```

Using `..` with the cd command will change your current directory to the parent directory. That is, the directory that contains your current directory. You can check where you are now by one command we mentioned above.

Now we can delete the directory and its contents all at once.

- macOS:

```
$ rm -r to_be_deleted
```

The `-r` represents recursive. The “remove recursively” operation is especially for removing directories. It will remove everything inside of the `to_be_deleted` directory.

- Windows:

```
> rmdir /S to_be_deleted
```

You can check whether the directory is removed by one command we mentioned above. **However, all remove commands like del, rm, rmdir are irreversible. Think twice before you do any deleting!**

How to get help?

One last thing before you go to the next part, we want you to know how to call out the manual for each command. Let’s say we want to learn more about the `cd` command.

- macOS:

```
$ man cd
```

- Windows:

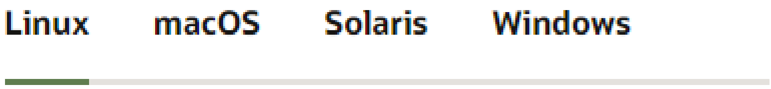
```
> cd /?
```

Help is also available online for Linux and Windows.

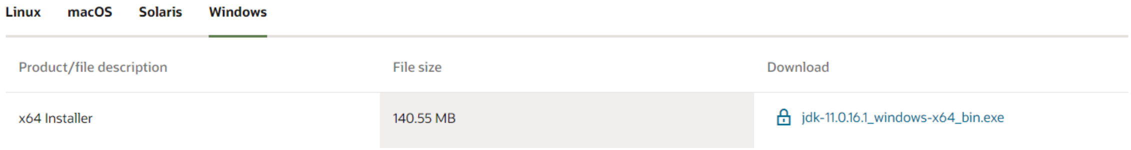
Part 4: Compile and run some code (100 points)

The last part of this assignment is for you to compile and run your first piece of code in CSE 8B. If you're using UCSD Linux Cloud or you are developing on a machine in the CSE basement, then JDK 11 is already installed and configured on your CSE 8B class account so you don't need to worry about the installation. However, if you prefer to work on a personal computer, you can find the installation steps below for Windows and macOS.

Install Java 11

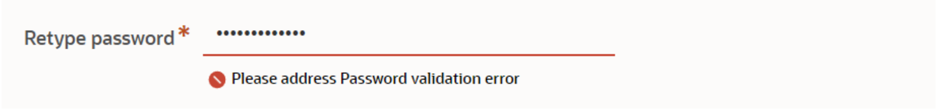
1. Navigate to the following link: https://www.oracle.com/java/technologies/downloads/#java11
2. Depending on your OS, select one of the following:
    a. 

3. Installation steps for **Windows**:
    a. Choose the **x64 Installer**



Product/file description	File size	Download
x64 Installer	140.55 MB	jdk-11.0.16.1_windows-x64_bin.exe

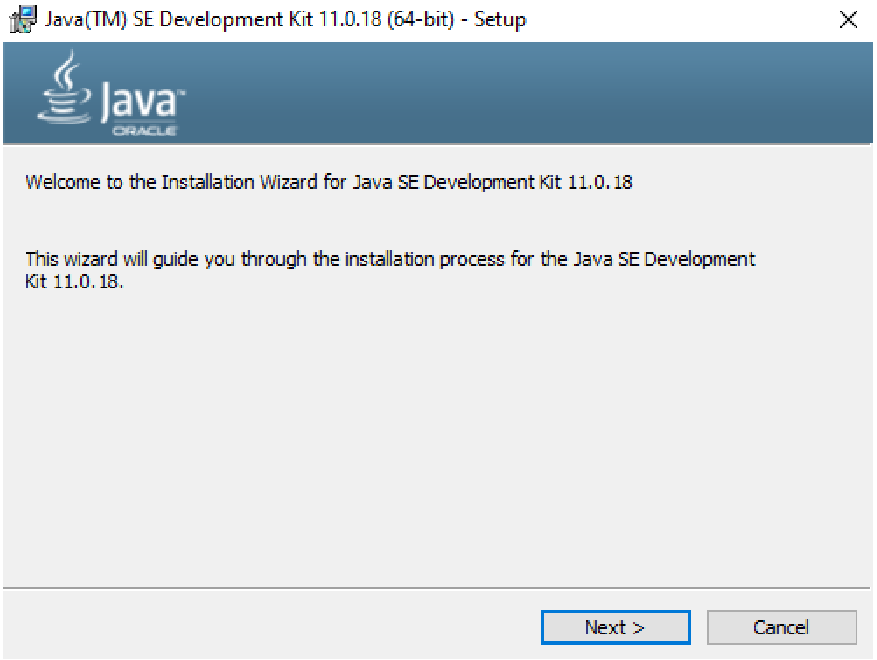
    b. It will prompt you to create an Oracle account. Create one, login, and download the executable.
    c. If you receive a password validation error even though your passwords match, try creating the account in an Incognito/Private/InPrivate window.



Retype password * •••••••••••••

Please address Password validation error

d. Run the executable that you just downloaded and follow through the setup wizard



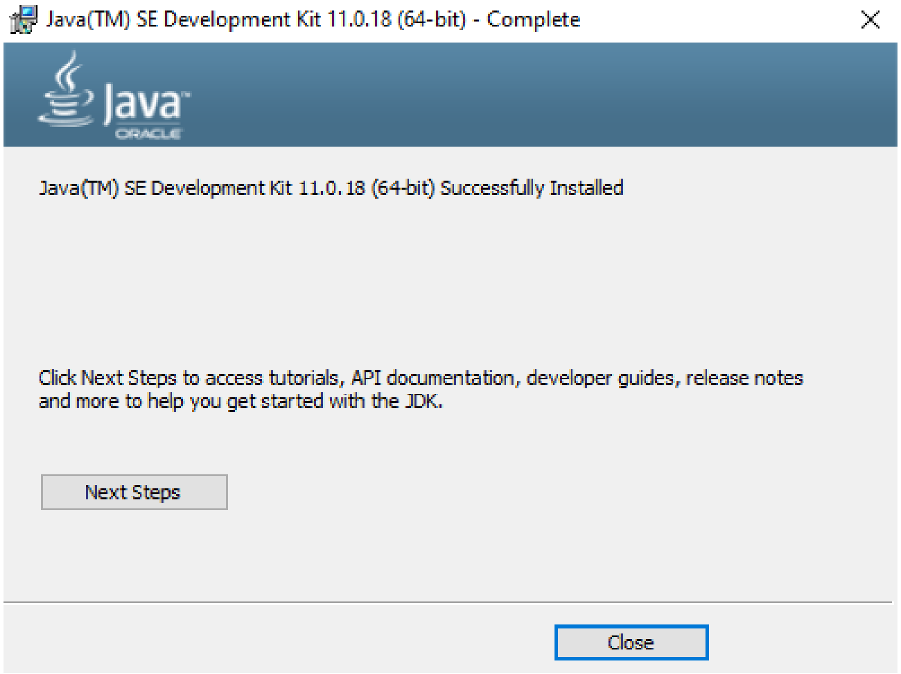
Java(TM) SE Development Kit 11.0.18 (64-bit) - Setup

Welcome to the Installation Wizard for Java SE Development Kit 11.0.18

This wizard will guide you through the installation process for the Java SE Development Kit 11.0.18.

e. Install it in the default directory

f. You should now have this. You can click close:



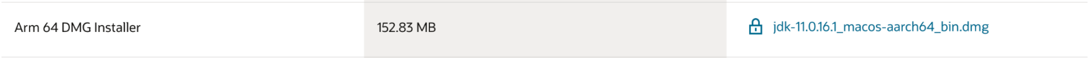
Java(TM) SE Development Kit 11.0.18 (64-bit) - Complete

Java(TM) SE Development Kit 11.0.18 (64-bit) Successfully Installed

Click Next Steps to access tutorials, API documentation, developer guides, release notes and more to help you get started with the JDK.

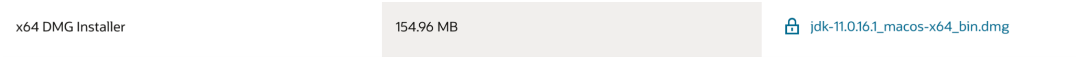
4. Installation steps for **MacOS**

   a. If you have a Mac with Apple Silicon, choose the **Arm DMG Installer**



Arm 64 DMG Installer	152.83 MB	jdk-11.0.16.1_macos-aarch64_bin.dmg

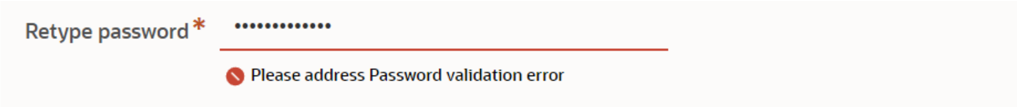
b. If you have a Mac with an Intel chip, choose **x64 Installer**



x64 DMG Installer	154.96 MB	jdk-11.0.16.1_macos-x64_bin.dmg

c. It will prompt you to create an Oracle account. Create one, login, and download the executable.

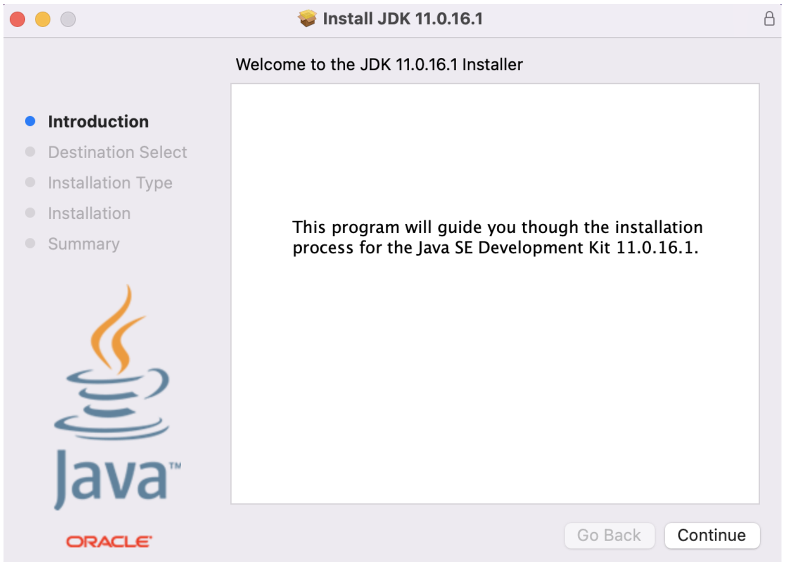
d. If you receive a password validation error even though your passwords match, try creating the account in an Incognito/Private/InPrivate window.



Retype password * •••••••••••••

Please address Password validation error

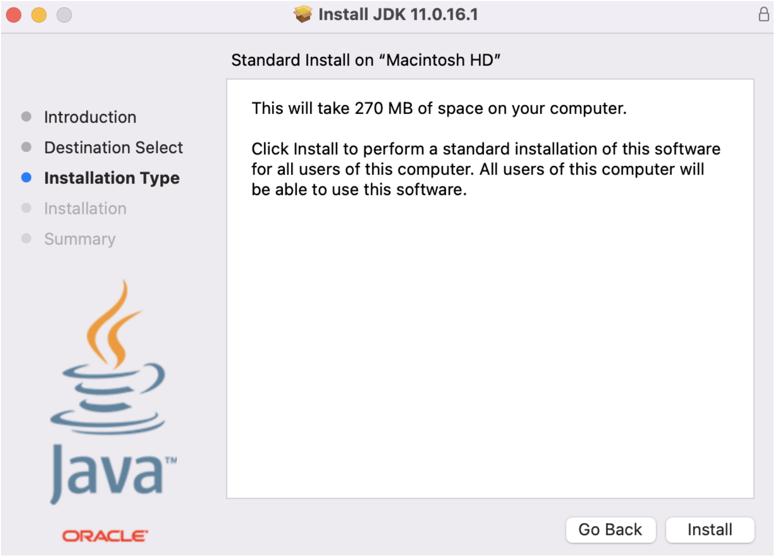
e. Open the pkg installer and follow through the installation instructions



Welcome to the JDK 11.0.16.1 Installer

This program will guide you though the installation process for the Java SE Development Kit 11.0.16.1.

f. Click “Continue” and you should see this:

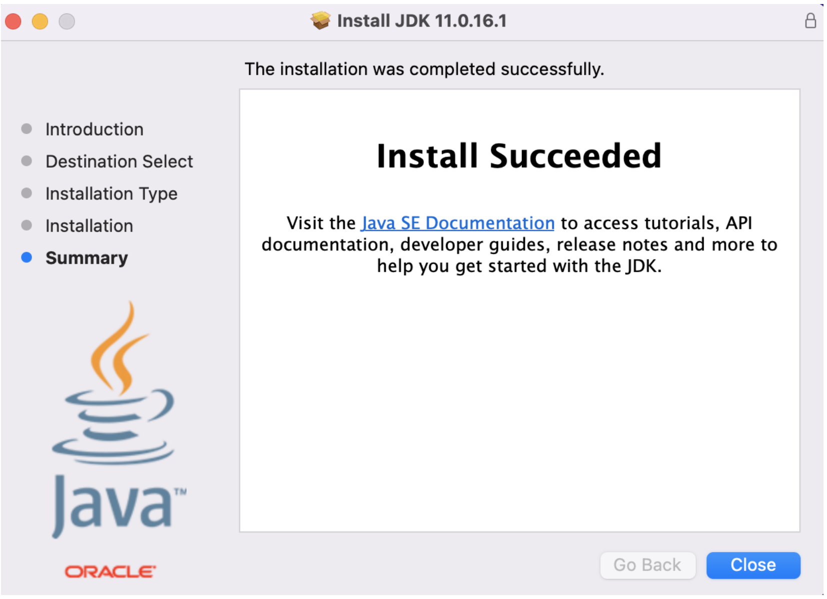


Standard Install on “Macintosh HD”

This will take 270 MB of space on your computer.

Click Install to perform a standard installation of this software for all users of this computer. All users of this computer will be able to use this software.

g. Provide your login credentials and click "Install". After installation, you should see the following:



The installation was completed successfully.

Install Succeeded

Visit the [Java SE Documentation] to access tutorials, API documentation, developer guides, release notes and more to help you get started with the JDK.

h. Click "close" and you're done!

Note: it's perfectly fine to see version "11.0.18" in the above screenshots.

Now you should have installed the right version of Java (i.e., Java 11) for this course… but how do you check if you installed it correctly?

Please open your terminal and go to the cse8b directory first (do you remember where you created it?)

Then, run the following command.

- macOS:

```
$ java -version
```

- Windows:

```
> java -version
```

You should see the Java version "11.0.18" now. We want to make sure you've installed Java correctly, so we're going to ask you to turn in a record of your installation.

Run the following command:

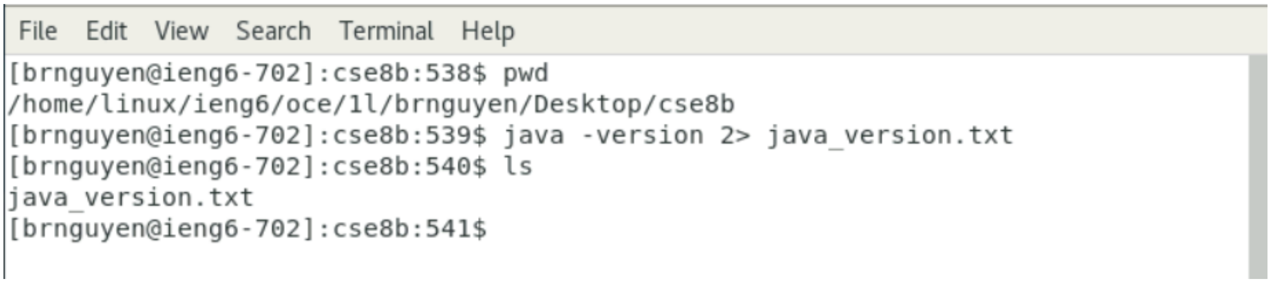
- macOS:

```
$ java -version 2> java_version.txt
```

- Windows:

```
> java -version 2> java_version.txt
```

You will find a new .txt file generated. Please check if that file contains the correct Java version information. **The file java_version.txt will be submitted to Gradescope.** As a sanity check, it should look a little like this:



```
[brnguyen@ieng6-702]:cse8b:538$ pwd
/home/linux/ieng6/oce/1l/brnguyen/Desktop/cse8b
[brnguyen@ieng6-702]:cse8b:539$ java -version 2> java_version.txt
[brnguyen@ieng6-702]:cse8b:540$ ls
java_version.txt
[brnguyen@ieng6-702]:cse8b:541$
```

Notice the path when we use the **pwd** (Linux) or **cd** (Windows) command? We're inside the **cse8b** directory when we run the command to generate our java version into a txt file. Afterwards, when we use the **ls** (Linux) or **dir** (Windows) command, we can see our file!

Note: If you run into issues or observe a different version number when running these commands after you've installed JDK 11, you may either need to:

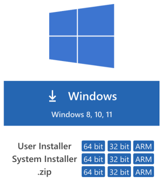
1. Restart your terminal and run the commands again
2. Make changes to your system Path variable (though this is typically not necessary): https://www.java.com/en/download/help/path.html

Now that we have Java 11 installed, let's try to compile and run a piece of code from the command line.

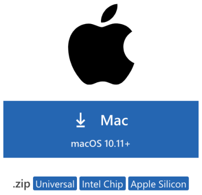
Visual Studio Code

You can use any text editor (e.g., Vim, Notepad (Windows), TextEdit (macOS)) you want to edit the files in your programming assignments. Do not use an Integrated Development Environment (IDE) that automatically generates source code, as 1) you need to learn how to write all source code yourself and 2) the resulting source code often will fail to compile and/or run in Gradescope, resulting in a score of 0! Here, we will be installing Visual Studio Code (VS Code), a lightweight, great text editor. Visual Studio Code is already installed in your Linux Cloud environment. However, if you are working with your own machine on Windows or Mac, you can install VS Code by following the link below.

1. Navigate to this link: https://code.visualstudio.com/download
2. Download the respective executable:
    a. For Windows:


Windows
Windows 8, 10, 11
User Installer 64 bit 32 bit ARM
System Installer 64 bit 32 bit ARM
.zip 64 bit 32 bit ARM

    b. For macOS:



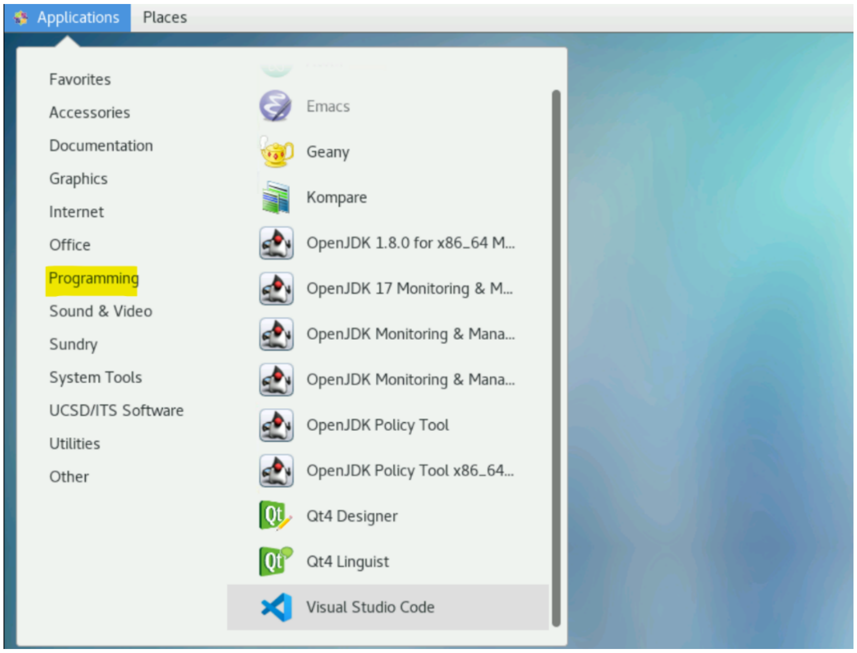
3. Follow the installation instructions depending on your OS.

Your First Java Program

You will create a new Java file named Assignment1.java in Visual Studio Code.

1. Open up Visual Studio Code.

a. If you are on the UCSD Linux Cloud or using one of the basement computers. On the top left corner of the window, select Applications → Programming → Visual Studio Code.

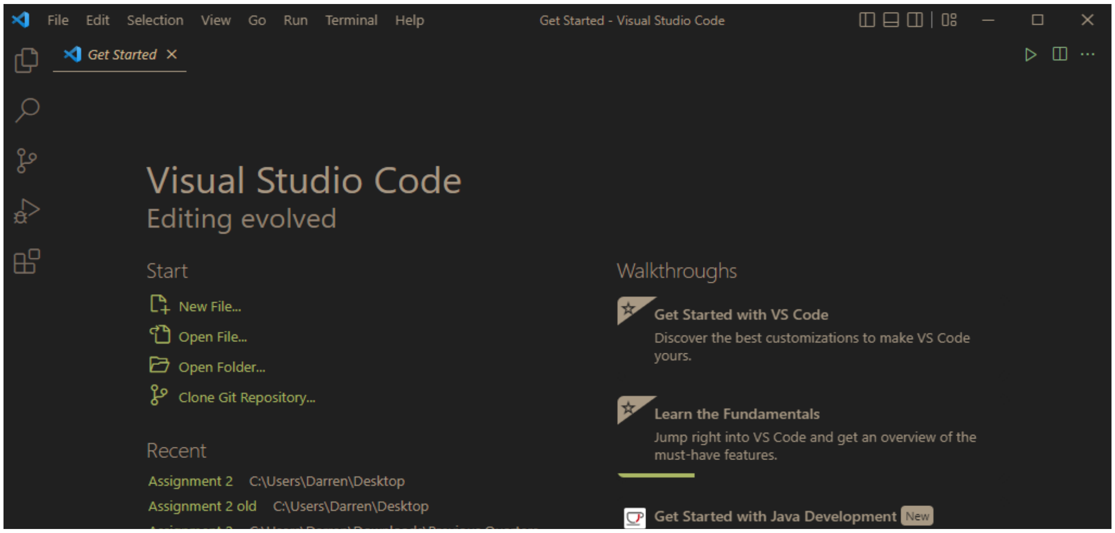


b. If you are using a personal computer, you can open ‘Visual Studio Code’ like you would with a normal application.

c. Alternatively, if you are on the **cmd, CLI, console, or terminal,** you can type in ‘code’ and it should open up Visual Studio Code as well (pretty neat right?).

2. You should be prompted with a page that looks similar to the one below:

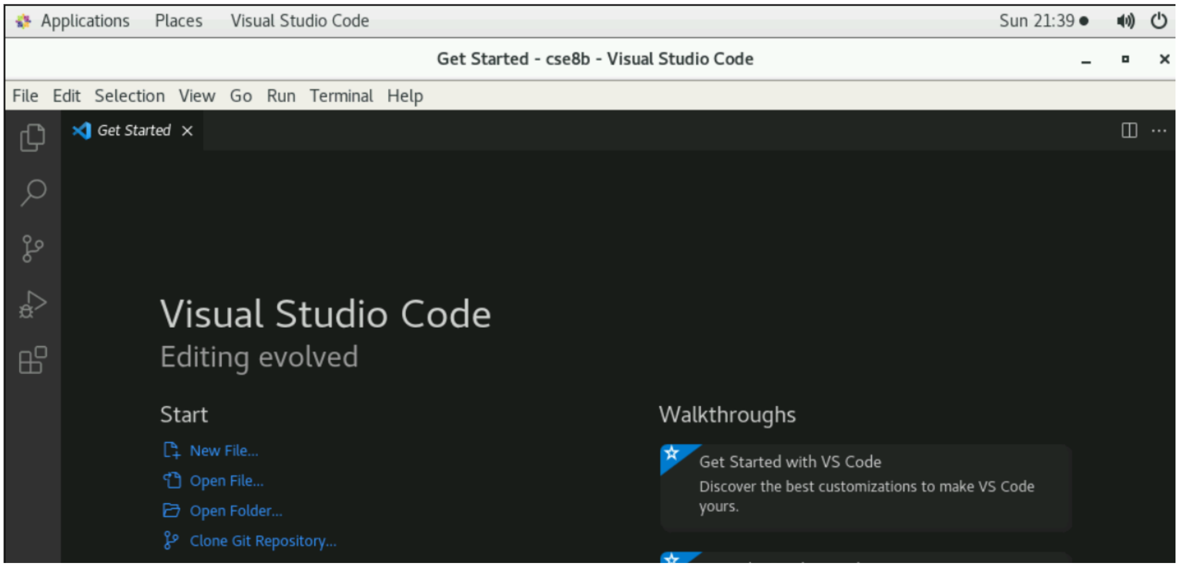
a. Personal computer



Discover the best customizations to make VS Code yours.

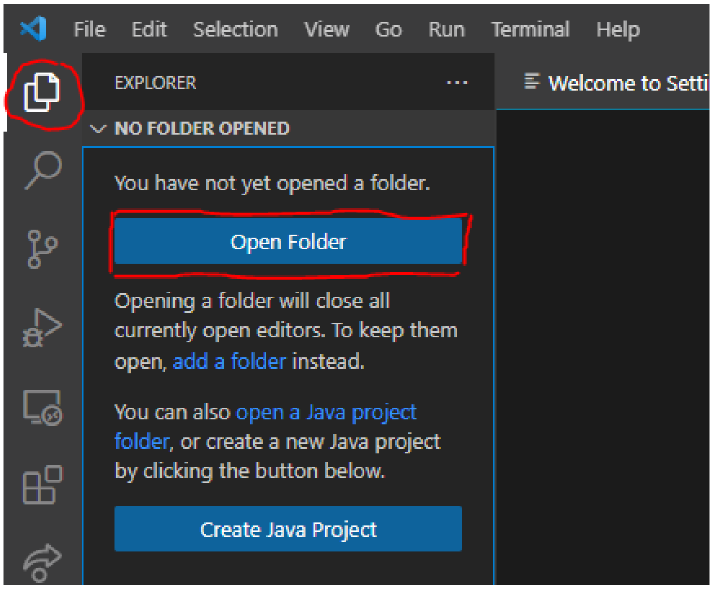
Jump right into VS Code and get an overview of the must-have features.

b. Linux Cloud


Applications Places Visual Studio Code
Sun 21:39
Get Started - cse8b - Visual Studio Code
File Edit Selection View Go Run Terminal Help
Get Started
Visual Studio Code
Editing evolved
Start
New File...
Open File...
Open Folder...
Clone Git Repository...
Walkthroughs
Get Started with VS Code
Discover the best customizations to make VS Code yours.

3. Let’s navigate to our **cse8b** directory we created before!

   Click on the Explorer tab and select “Open Folder” in VS Code to locate your directory.

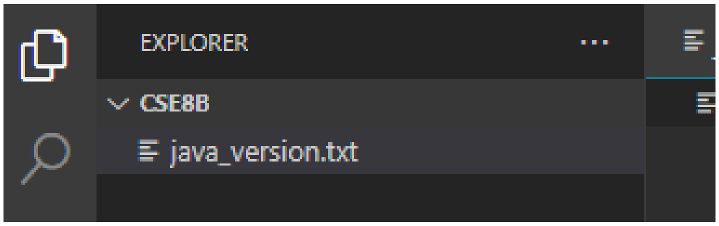


You have not yet opened a folder.

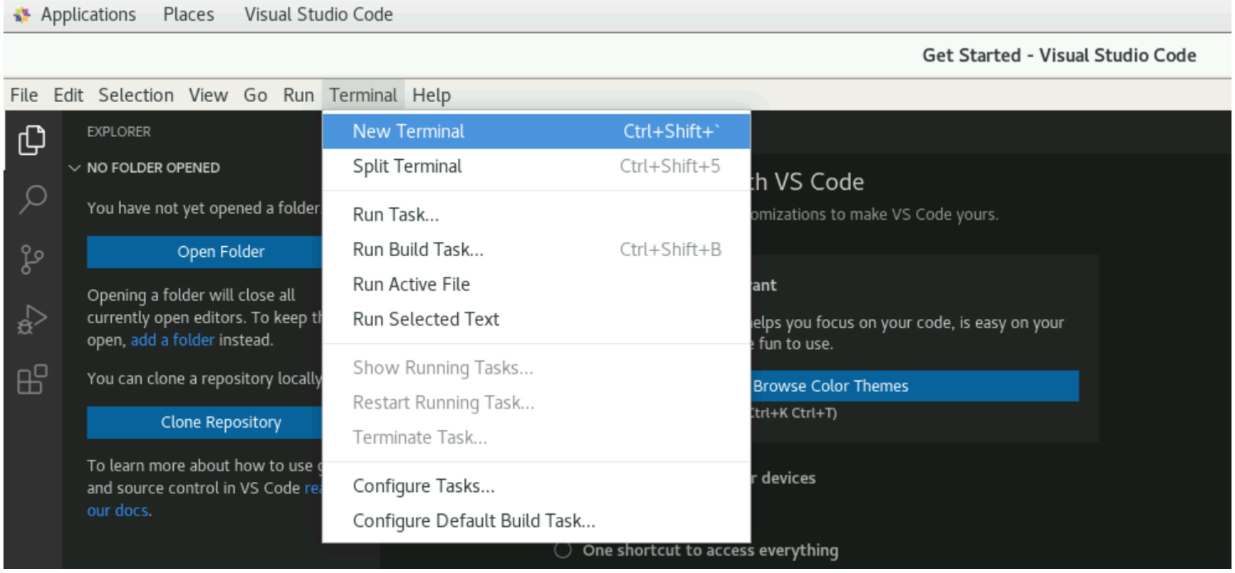
Opening a folder will close all currently open editors. To keep them open, add a folder instead.

You can also open a Java project folder, or create a new Java project by clicking the button below.

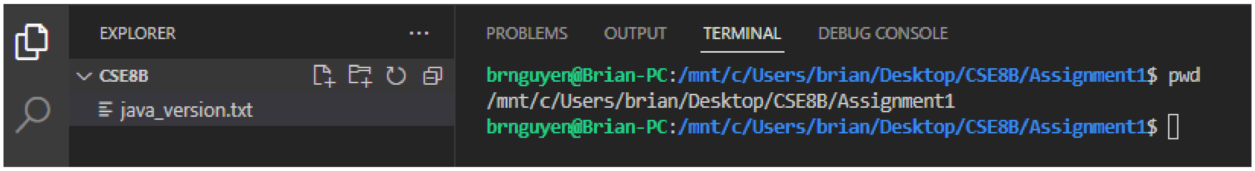
4. We should be able to see our file explorer on the left-hand side.



5. Next, on the VS Code toolbar at the top, select Terminal → New Terminal.

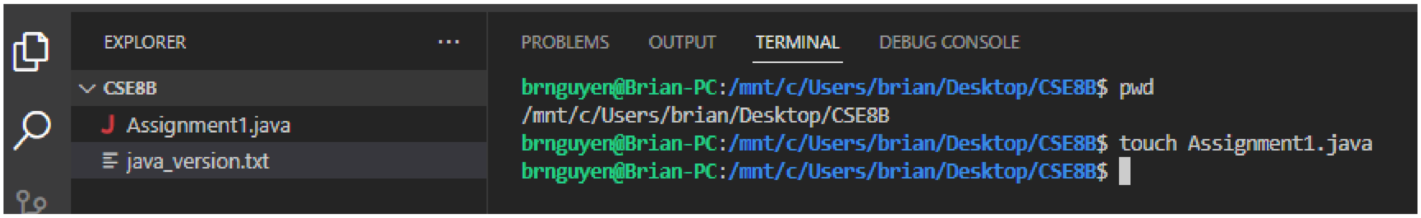

Applications
Places
Visual Studio Code
Get Started - Visual Studio Code
File
Edit
Selection
View
Go
Run
Terminal
Help
EXPLORER
NO FOLDER OPENED
You have not yet opened a folder
Open Folder
Opening a folder will close all currently open editors. To keep th open, add a folder instead.
You can clone a repository locally
Clone Repository
To learn more about how to use g and source control in VS Code rea our docs.
New Terminal Ctrl+Shift+`
Split Terminal Ctrl+Shift+5
Run Task...
Run Build Task... Ctrl+Shift+B
Run Active File
Run Selected Text
Show Running Tasks...
Restart Running Task...
Terminate Task...
Configure Tasks...
Configure Default Build Task...
th VS Code
omizations to make VS Code yours.
ant
elps you focus on your code, is easy on your fun to use.
Browse Color Themes
trl+K Ctrl+T)
r devices
One shortcut to access everything

6. Look familiar? You just opened up CLI in VS Code!



```
brnguyen@Brian-PC:/mnt/c/Users/brian/Desktop/CSE8B/Assignment1$ pwd
/mnt/c/Users/brian/Desktop/CSE8B/Assignment1
brnguyen@Brian-PC:/mnt/c/Users/brian/Desktop/CSE8B/Assignment1$
```

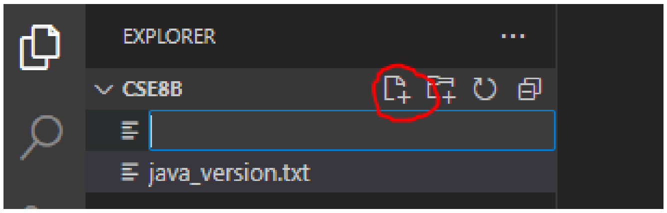
7. Now let's create a Java file called **Assignment1.java**. You can do this either from the CLI we just opened or by simply using VS Code.
   a. CLI
      i. Create the **Assignment1.java** file using 'touch' or 'type'



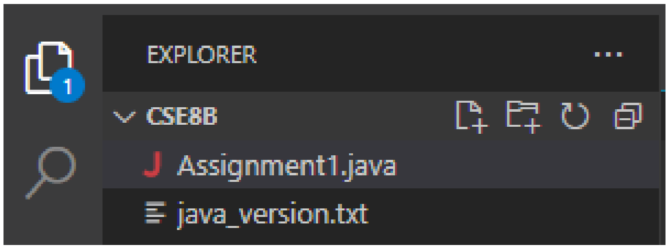
```
brnguyen@Brian-PC:/mnt/c/Users/brian/Desktop/CSE8B$ pwd
/mnt/c/Users/brian/Desktop/CSE8B
brnguyen@Brian-PC:/mnt/c/Users/brian/Desktop/CSE8B$ touch Assignment1.java
brnguyen@Brian-PC:/mnt/c/Users/brian/Desktop/CSE8B$ 
```

b. VS Code

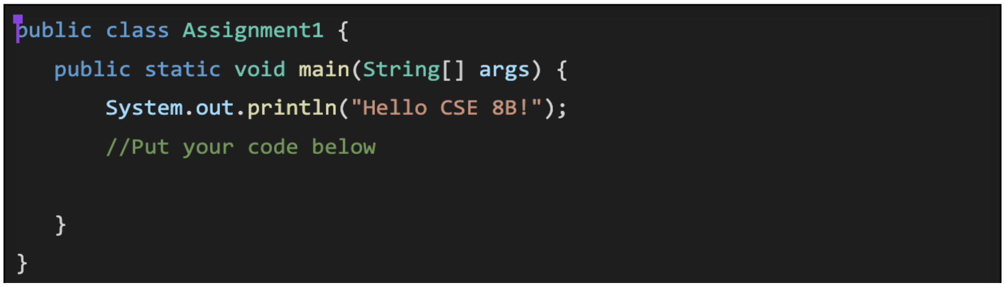
i. Use the ‘add file’ icon.



ii. Name the file.



8. Type the contents of the screenshot below into your newly created Java file



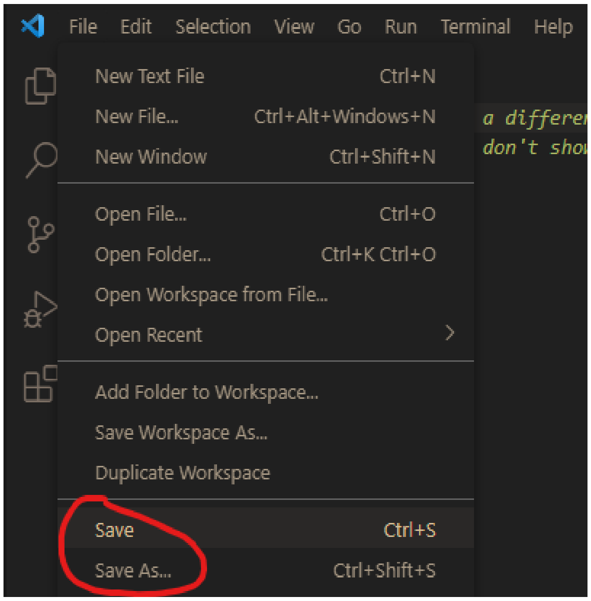
```
public class Assignment1 {
    public static void main(String[] args) {
        System.out.println("Hello CSE 8B!");
        //Put your code below

    }
}
```

9. Then, you need to write two lines of code below `//Put your code below`

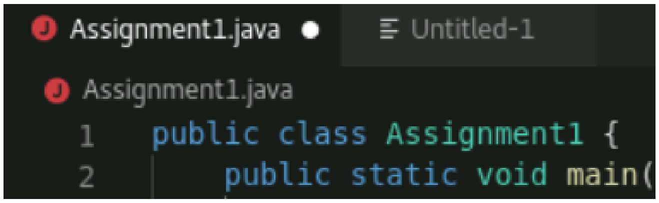
a. **My name is <your name>** starting from a new line**.** You’ll need to use the System.out.println method to accomplish this. Refer to the source code line that prints out “Hello CSE 8B!” but replace the text between the double quotation marks with My name is <your name>

b. Then on another new line, tell the class what you like: **I like <what you like>**

10. Save this file to your cse8b directory by navigating to the top left-hand corner again or by pressing <**CTRL**> and **S** (Windows) or <**CMD**> and **S** (Mac) at the same time.



You will know if your new code is saved when the white dot next to the filename at the top of the tab disappears. In the below screenshot, recent changes to Assignment1.java are unsaved.



```
public class Assignment1 {
    public static void main(
```

11. After that, go back to the terminal and make sure you are within the cse8b directory. Before you run every Java code, you need to compile it first using the `javac` command. **Important Note:** **If you make changes to a Java file, you will need to compile your code again before you can run the file with the updated changes.**

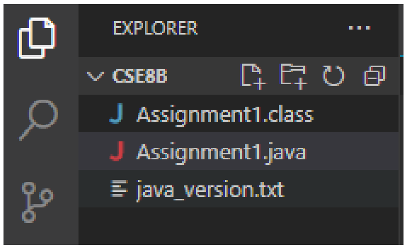
- macOS:

```
$ javac Assignment1.java
```

- Windows:

```
> javac Assignment1.java
```

Notice that a brand new .class file appeared in the cse8b directory after compiling! (If it doesn't show up in VS Code, you can still see it when you call "ls" or "dir" in the CLI.



Then you can run the program using the `java` command.

- macOS:

```
$ java Assignment1
```

- Windows:

```
> java Assignment1
```

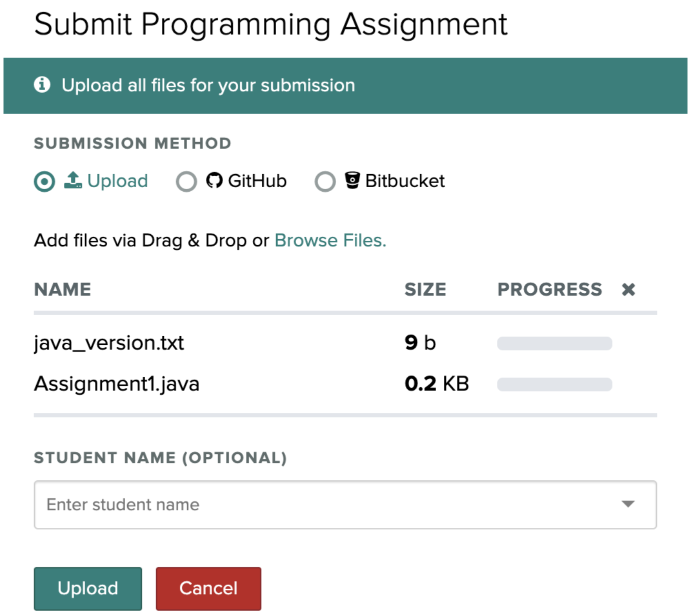
You should see three lines of output in the terminal.

```
Hello CSE 8B!
My name is Brian
I like chocolate
```

Submission Instructions

VERY IMPORTANT: Please follow the instructions below carefully and make the exact submission format.

1. Go to Gradescope and click on PA1.
2. Click the DRAG & DROP section and directly select the two required files (**java_version.txt and Assignment1.java**). Drag & drop is fine. *Please make sure you don't submit a zip.* Just the two files solely. *Make sure the names of the files are correct.*
3. **You can resubmit unlimited times before the due date.** Your score will depend on your final submission, even if your former submissions have a higher score.
4. The autograder is for grading your uploaded files automatically. For this first assignment, the autograder (grading script) will display to you the result/score of your submission immediately.
5. Your submission should look like the below screenshot (order of file doesn't matter). If you have any questions, feel free to post them on Piazza!



Submit Programming Assignment

Upload all files for your submission

SUBMISSION METHOD

● Upload ○ GitHub ○ Bitbucket

Add files via Drag & Drop or Browse Files.

NAME	SIZE	PROGRESS
java_version.txt	9 b	
Assignment1.java	0.2 KB	

STUDENT NAME (OPTIONAL)

Enter student name