JDK 8 Setup Instructions

[http://adoptopenjdk.net/releases.html (Links to an external site.)](http://adoptopenjdk.net/releases.html)

This is a direct link to the official Java SE download page from the AdoptOpenJDK project; it includes a link to Java 8.

When you are ready to install Java on your personal computer, open this link, select the most recent version of Java 8 if it is not selected already, and be sure to select the correct platform.  For example, if you are running a 64-bit version of Windows (which you probably are if you have a fairly recent computer), click the "Windows x64" link to download the 64-bit installer.  If you have a 32-bit computer, download the "Windows x86" version instead.

**NOTE**: During the installation, be sure that the "**Set JAVA\_HOME Variable**" feature is enabled in the "Custom Setup" screen; to do this, click the drop-down list of options next to this feature and choose "**Will be installed on local hard drive**."

If you have already completed the installation, and if you subsequently have trouble getting NetBeans and other Java applications to find your JDK, you may need to set this variable manually.  Fortunately, this is not difficult; see the instructions below:

**Microsoft Windows**

Open the File Explorer, then right-click "**This PC**" in the list of locations on the left and choose "**Properties**."  The "**System**" window should appear, showing information about your version of Windows.

Click the "**Advanced system settings**" link on the left to open the "**System Properties**" window; in the "**Advanced**" tab of this window, click the "**Environment Variables**" button.  Yet another window will open, showing a list of environment variables at the top and system variables at the bottom.

You should see a "**New...**" button near the bottom of this window; click this button, and when prompted, enter "**JAVA\_HOME**" as the variable name and "**C:\Program Files\AdoptOpenJDK\jdk-8.0.222.10-hotspot\**" as the variable value.  Enter both without the double-quotes.  
  
*(Note that this is the version of OpenJDK that I am using currently.  Your version number may be slightly different, so you should click "Browse Directory" and then browse the filesystem on your "C:" drive to find the installation folder under "****C:\Program Files\AdoptOpenJDK\****"; if the folder name is different, use it instead.)*

Click "**OK**" in each of the open windows to commit your changes, and after they have all been closed, test your OpenJDK installation again.

MySQL Server 5.7 Setup Instructions

**IF YOU ALREADY HAVE MYSQL INSTALLED**: You should not need to re-install MySQL, so you can skip the instructions outlined below.  (The only possible exception is the addition of MySQL to your system path; if you have not already done this, see the "Adding MySQL To Your System Path" section below.)

However, if you find that you are unable to log in to MySQL because you have forgotten your root password, you will need to reset it.  See the following page for a walk-through of this procedure:

[MySQL Server Root Password Reset Instructions](https://jsu.instructure.com/courses/10254/pages/mysql-server-root-password-reset-instructions)

**Microsoft Windows**

Here is the installer for the MySQL 5.7 Server and Workbench for Windows ...

[https://jsu-my.sharepoint.com/:u:/g/personal/jsnellen\_jsu\_edu/EWwSRNJiJYJItda-7yhIZKIBbTJZwP0fClXjQEvuJMrjbg?e=tx4IxD (Links to an external site.)](https://jsu-my.sharepoint.com/:u:/g/personal/jsnellen_jsu_edu/EWwSRNJiJYJItda-7yhIZKIBbTJZwP0fClXjQEvuJMrjbg?e=tx4IxD)

... and here is the installer for the MySQL GUI Tools ...

[https://jsu-my.sharepoint.com/:u:/g/personal/jsnellen\_jsu\_edu/EfDjnyPNHghEv0igwS6mmjkByeZDJu-Ug1qInUnijjRNaQ?e=wJFl7h (Links to an external site.)](https://jsu-my.sharepoint.com/:u:/g/personal/jsnellen_jsu_edu/EfDjnyPNHghEv0igwS6mmjkByeZDJu-Ug1qInUnijjRNaQ?e=wJFl7h)

Below is a list of steps for performing a minimal installation of MySQL Server on a Windows workstation.  Follow these instructions carefully,

1. Launch the MySQL Community Edition installer. At the License Agreement screen, check the "I accept the license terms" checkbox and click "Next."  ***If you are prompted at any time to download updates to the installer, you should skip these updates!***

2. At the "**Choose a Setup Type**" screen, select "**Custom**" and click "**Next.**"

3. In the "**Select Products and Features**" screen, expand the "**MySQL Servers**" branch of the "Available Products" tree, then the "**MySQL Server**" branch, then the "**MySQL Server 5.7**" branch. Select "**MySQL Server 5.7.23 - X64**", then click the right arrow to select this product for installation.

4. Next, expand the "**Applications**" branch, then the "**MySQL Workbench**" branch, then the "**MySQL Workbench 8.0**" branch. Select "**MySQL Workbench 8.0.12 - X64**", then click the right arrow to select this product for installation.

5. Finally, expand the "**MySQL Connectors**" branch, then the "**Connector/J**" branch, then the "**Connector/J 8.0**" branch. Select "**Connector/J 8.0.12 - X86**", then click the right arrow to select this product for installation.

6. Click "**Next**" to proceed to the "**Installation**" screen. There should be three products listed: **MySQL Server 5.7.23**, **MySQL Workbench 8.0.12**, and **Connector/J 8.0.12**. Click "Execute" to proceed with the installation. This may take a few minutes.

(If you are presented with a prompt about "failed requirements", go ahead and install whatever additional components are required; usually, these are one or more missing runtime libraries. Click "Execute" to [install](https://jsu.instructure.com/courses/10254/pages/mysql-server-5-dot-7-setup-instructions) the components, then "**Next**" to proceed.)

7. After all three installations are complete, click "**Next.**" The "**Product Configuration**" screen will indicate that MySQL Server 5.7.23 is ready to configure. Click "Next" again to proceed.

8. Accept the default options in the "**Group Replication**" and the "**Type and Networking**" screens, clicking "**Next**" for each. At the “**Accounts** **and Roles**" screen, enter the password "**CS425**" *(or some other password that you will be sure to remember)* as your MySQL root password, then enter it again to confirm. Click "Next."

9. Accept the default options at the "**Windows Service**" and "**Plugins and Extensions**" screens, clicking "**Next**" for each.

10. Click "**Execute**" at the "**Apply Configuration**" screen. As each configuration step is completed, it will be marked with a green checkbox. This may take a few minutes.

11. After all configuration steps are complete, click "**Finish**." You will then be taken back to the "**Product Configuration**" screen. Click "**Next,**" then click "**Finish**" at the "**Installation Complete**" screen to complete the MySQL installation. The installer may automatically launch the MySQL Workbench; if so, close it for now.

12. Open a Command Prompt window and enter the following command:

**cd "C:\Program Files\MySQL\MySQL Server 5.7\bin"**

13. Enter the command “**mysql\_secure\_installation”** and enter your root password when prompted. Next, you will be prompted with a series of configuration questions. Answer "**N**" to the "**Validate Password Plugin**" and "**Change the password for root**" questions, and "**Y**" to all other questions. After the last question, you may close the Command Prompt window.

14. Finally, launch the MySQL GUI Tools installer, choose a "Complete" installation, and accept all default options. Click "Finish" when the installation is finished.

The attached "**DatabaseTest**" archive (see the link at the top of this page) is a simple Java program, in the form of a NetBeans project, which you can use to test your MySQL installation.  To import the test database from the "**db\_test.sql**" file, launch the "**MySQL Administrator**", log in to the database server using the address "**localhost**" and the root username and password.  Next, "**Restore**" from the menu on the left, click "**Open Backup File,**" browse to your downloaded copy of the "**db\_test.sql**" file, then click "**Start Restore.**"  The sample database will be imported.

Open the "**DatabaseTest**" project in NetBeans and change the root password as needed; when you run the program, it should be able to add a new record, retrieve the list of records, and print them to the console in table form.

**ADDING MYSQL TO YOUR SYSTEM PATH:** In addition to the MySQL Administrator and Workbench, we will also be using the command-line MySQL Client.  In order to use the MySQL Client from the command prompt, it will be necessary to add the MySQL Server to your system path. Unfortunately, this is not done by the MySQL installer, so we will have to do it ourselves. Here is the list of steps, which should only need to be done once:

Open the File Explorer, then right-click "**This PC**" in the list of locations on the left and choose "**Properties**." The "**System**" window should appear, showing information about your version of Windows.

Click the "**Advanced system settings**" link on the left to open the "**System Properties**" window; in the "**Advanced**" tab of this window, click the "**Environment Variables**" button. Yet another window will open, showing a list of environment variables at the top and system variables at the bottom.

You should see a "**Path**" variable listed among the system variables at the bottom of the window (do not choose the "Path" variable at the top!). Select this variable and choose "**Edit**."

A new window will appear with a list of the current entries in your system path. Click the "**New**" button, and after the blank field appears at the bottom of the list, enter the location of your MySQL Server installation into this field: "**C:\Program Files\MySQL\MySQL Server 5.7\bin**", entered without the quotes. (If your installation location is different, enter it instead.)

Click "**OK**" in each of the open System Properties windows to commit your changes. You should now be able to open a new Command Prompt window and launch the MySQL Client at the prompt.

**Mac OS X**

Below is a list of steps for performing a minimal installation of MySQL Server 5.7 on a Macintosh workstation.  Follow these instructions carefully,

1. To make the installation of MySQL5.7 (and, later, Tomcat 8.5.x) as simple as possible, we will use Homebrew, a popular package manager for Mac OS X.  If you do not already have it installed, open a Terminal window, then install Homebrew by entering the following command at the terminal prompt:

**/usr/bin/ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install)"**

This command, and the ones which follow, should be entered on one line, *exactly* as shown.

(Note: Homebrew will download and install the **Command Line Tools for Xcode** as part of the installation process; depending on your system and your Internet connection speed, this may take a while.)

After installing Homebrew, install brew services with the following command:

**brew tap homebrew/services**

2. Install MySQL 5.7 through Homebrew with the following command:

**brew install mysql@5.7**

3. Start MySQL 5.7 with the following command:

**brew services start mysql@5.7**

You should see a message indicating that the MySQL server started successfully.  To confirm this, and to see the state of all services started through Homebrew, enter the following command:

**brew services list**

4. Enter the following command at the terminal to set the root password:

**/usr/local/opt/mysql\@5.7/bin/mysqladmin -u root password 'CS425'**

(This sets the root password to "**CS425**".  If you prefer, use another password which you are sure to remember, such as your JSU student number.)

5. Log in to MySQL by entering the following command:

**/usr/local/opt/mysql\@5.7/bin/mysql -u root -p**

You will be prompted to enter the root password that you set earlier.  If you can log in, you have successfully configured MySQL.

The attached "**DatabaseTest**" archive (see the link at the top of this page) is a simple Java program, in the form of a NetBeans project, which you can use to test your MySQL installation with a sample database.  To import the sample database from the "**db\_test.sql**" file, enter the following command at the MySQL prompt:

**source ~/db\_test.sql**

(This assumes that the file has been copied to your home folder; if it is in a different location, make the corresponding changes.)

Finally, open the "**DatabaseTest**" project in NetBeans and change the root password as needed; when you run the program, it should be able to add a new record, retrieve the list of records, and print them to the console in table form.

Apache Tomcat Setup Instructions

[https://tomcat.apache.org/download-80.cgi#8.5.45 (Links to an external site.)](https://tomcat.apache.org/download-80.cgi#8.5.45)

The first link is a link to the official download page for Apache Tomcat.  Use this download link to get a standalone installer for Tomcat; for integration with NetBeans 8.2, I recommend Tomcat version 8.5.x.  There is a file called "**TomcatFiles.zip**" in the root of the repository; you will be using the files contained in this archive during the installation process.

The installation instructions given below assume that you already have the MySQL Server installed and configured on your workstation; if you do not, complete the installation instructions for MySQL before proceeding.

**Microsoft Windows**

1. Download and launch the 32-bit/64-bit Windows Service Installer provided on the official Apache Tomcat download page.  During the installation, select the optional components "**Host**[**Manager**](https://jsu.instructure.com/courses/10254/pages/apache-tomcat-setup-instructions)" and "**Examples**", and when prompted, set the **HTTP/1.1 Connector Port** to **8180**.

2. From the Start Menu, open the "**Apache Tomcat**" program group and launch "**Configure Tomcat**".  You will see a dialog box with "**Start**" and "**Stop**" buttons, as well as an indication of the Tomcat service status.  If the service is started, click "**Stop**" to stop it for now.

3. Once Tomcat is installed, download and extract the attached "**TomcatFiles.zip**" archive to a separate folder.  Copy the \*.jar files ("**json-simple-1.1.1.jar**" and "**mysql-connector-java.jar**") from the archive to the following location ...

**C:\Program Files\Apache Software Foundation\Tomcat 8.5\lib**

... and copy the "**server.xml**" configuration file from the archive to the following location ...

**C:\Program Files\Apache Software Foundation\Tomcat 8.5\conf**

4. Open a Command Prompt window and log in to MySQL using your root password:

**mysql -u root -p**

Once you are logged in to MySQL, enter the following command at the MySQL prompt to import the sample authority database from the "TomcatFiles.zip" archive:

**source C:\Users\JSU\Desktop\TomcatFiles\authority\_db.sql**

(This assumes that the database file is located in a folder on your desktop and that your username is "**jsu**"; if the name or location are different, make the corresponding changes.  Or, simply enter "**source**" at the prompt followed by a space, then drag and drop the "**authority\_db.sql**" file into the Command Prompt window; this will enter the absolute path of the file.)

5. Once the authority database has been successfully imported, issue the following two commands, one at a time, to create an [account](https://jsu.instructure.com/courses/10254/pages/apache-tomcat-setup-instructions) for Tomcat to use for authentication purposes:

**grant select on authority.\* to 'authority'@'localhost' identified by 'authority';**  
**flush privileges;**

6. Relaunch "**Configure Tomcat**" from the Tomcat program group and click the "**Start**" button to restart the Tomcat service.  You should see a message indicating that the service was started successfully.

7. Open a Web browser and enter the following URL into a new tab:

**http://localhost:8180/**

(You should see the default home page of the Apache Tomcat server hosted on your system.)

Click the "**Manager App**" button on the left side of the page; when prompted, log in using the username "**admin**" and the password "**3^3@yer$**" (this password is defined in the authority database you imported earlier).  If you are able to log in, it means that Tomcat is communicating successfully with MySQL; you should see the Tomcat Web Application Manager, where you can manually deploy or undeploy web applications.

(If your login is not accepted, ensure that the MySQL service is running (see the MySQL installation instructions), and that you copied the **\*.jar** files and configuration file to the correct locations, as specified earlier.)

8. Close the browser, and in the "**Configure Tomcat**" window, click "**Stop**" to stop the Apache Tomcat service.  Later, we will be managing the Apache Tomcat service through the NetBeans IDE.  To ensure that NetBeans will be able to do so, however, we must grant the necessary permissions.  Open the Windows Explorer file manager, browse to the location "**C:\Program Files\Apache Software Foundation**", and right-click the "**Tomcat 8.5**" folder and choose "Properties."

In the "**Security**" tab, click "**Edit**" to edit the security permissions, and in the list of "**Group or User Names**," select "**Users**" and check the "**Full control**" checkbox in the "**Permissions**" list.  Click "**Apply**," then "**OK**."

9. Proceed to the NetBeans installation instructions.

**Mac OS X**

1. If you have not already done so, download and [install](https://jsu.instructure.com/courses/10254/pages/apache-tomcat-setup-instructions) the Homebrew package manager [for Mac](https://jsu.instructure.com/courses/10254/pages/apache-tomcat-setup-instructions) OS X.  See the MySQL installation instructions for more information.

2. Open a Terminal window and issue the following command at the prompt to install Tomcat 8.5.x:

**brew install tomcat@8**

3. Once Tomcat is installed, download and extract the attached "**TomcatFiles.zip**" archive to a separate folder.  Copy the \*.jar files ("**json-simple-1.1.1.jar**" and "**mysql-connector-java.jar**") from the archive to the following location ...

**/usr/local/opt/tomcat@8/libexec/lib**

... and copy the "**server.xml**" configuration file from the archive to the following location ...

**/usr/local/opt/tomcat@8/libexec/conf**

4. Enter the following command at the Terminal prompt to log in to MySQL using your root password:

**mysql -u root -p**

Once you are logged in to MySQL, enter the following command at the MySQL prompt to import the sample authority database from the "**TomcatFiles.zip**" archive:

**source /Users/jsu/Desktop/authority\_db.sql**

(This assumes that the database file is located on your desktop and that your username is "**jsu**"; if the name or location are different, make the corresponding changes.  Or, simply enter "**source**" at the prompt followed by a space, then drag and drop the "**authority\_db.sql**" file into the Terminal window; this will enter the absolute path of the file.)

5. Once the authority database has been successfully imported, issue the following commands, one at a time, to [create an account](https://jsu.instructure.com/courses/10254/pages/apache-tomcat-setup-instructions) for Tomcat to use for authentication purposes:

**grant select on authority.\* to 'authority'@'localhost' identified by 'authority';**  
**flush privileges;**

6. Quit the MySQL prompt, then issue the following command to start the Apache Tomcat service:

**brew services start tomcat@8**

(You should see a message indicating that the service was started successfully.)

7. Open the Safari browser and enter the following URL into a new tab:

**http://localhost:8180/**

(You should see the default home page of the Apache Tomcat server hosted on your system.)  Click the "**Manager App**" button on the left side of the page; when prompted, log in using the username "**admin**" and the password "**3^3@yer$**" (this password is defined in the authority database you imported earlier).  If you are able to log in, it means that Tomcat is communicating successfully with MySQL; you should see the Tomcat Web Application Manager, where you can manually deploy or undeploy web applications.

(If your login is not accepted, ensure that the MySQL service is running (see the MySQL installation instructions), and that you copied the **\*.jar** files and configuration file to the correct locations, as specified earlier.)

8. Close the browser and enter the following Terminal command to stop the Apache Tomcat service:

**brew services stop tomcat@8**

Later, we will be managing the Apache Tomcat service through the NetBeans IDE.

9. Proceed to the NetBeans installation instructions.

# NetBeans 8.2 Setup Instructions

[https://netbeans.org/downloads/8.2/ (Links to an external site.)](https://netbeans.org/downloads/8.2/)

This is a direct link to the official NetBeans 8.2 installer.  Before installing NetBeans, make sure that you have **Java 8** installed (this version of NetBeans does not support Java 9 or above).  [Choose](https://jsu.instructure.com/courses/10254/pages/netbeans-8-dot-2-setup-instructions) the "**Download**" button beneath the "**Java EE**" version of NetBeans, which includes Web application functionality that we will be using in subsequent assignments.  Launch the installer after it has downloaded and accept the default options provided by the installation wizard.

After the installation is complete, follow the post-install configuration steps corresponding to your operating system platform to integrate the Apache Tomcat server with NetBeans.  The installation instructions given below assume that you already have Apache Tomcat 8.5.x installed and configured on your workstation; if you do not, complete the installation instructions for Tomcat before proceeding.

**IF YOU ALREADY HAVE NETBEANS 8.2 INSTALLED**: You should not need to reinstall NetBeans, so you can skip the instructions given below, but you should double-check to ensure that the necessary plugins and libraries are installed for developing web applications.  Launch NetBeans, and from the "**Tools**" menu, choose "**Plugins.**"  Open the "**Available Plugins**" tab and select the following three items:

**Java EE Base**  
**RESTful Web Services**  
**EJB and EAR**

Click the "[**Install**](https://jsu.instructure.com/courses/10254/pages/netbeans-8-dot-2-setup-instructions)" button, and allow any necessary dependencies to be installed as well.  If these plugins are not listed in the "**Available Plugins**" tab, look for them in the "**Installed**" tab; if all three are listed there, then the plugins are already installed, and there is nothing more that you need to do to.

**Microsoft Windows**

1. Launch NetBeans 8.2.  From the "**Tools**" menu, choose "**Servers.**"

2. Click the "**Add Server ...**" button in the lower left.  In the "**Choose Server**" dialog box, choose "**Apache Tomcat or TomEE**" from the list of servers and click "Next."

3. In the "**Installation and Login Details**" dialog box, enter the following location in the "Server Location" field:

**C:\Program Files\Apache Software Foundation\Tomcat 8.5**

In the "Username" and "Password" fields, enter the username "**admin**" and the password "**3^3@yer$**".  (Recall that these are the same credentials given in the Apache Tomcat installation instructions.)  Click "**Finish**."

4. Now, we must test starting and stopping the server, and deploying applications to the server, from within NetBeans.

From the "**File**" menu, choose "**New Project.**"  In the "**New Project**" dialog box, choose "**Java Web**" from the list of categories on the left, and "**Web Application**" from the list of projects on the right.  Click "**Next**", accept the default project name and location, then click "**Next**" again.  In the "**Server and Settings**" dialog box, choose "**Apache Tomcat or TomEE**" from the list of servers.  Click "**Finish**" to create the project.

5. Click the "Browser" button in the toolbar (to the left of the "Build Project" button), and in the drop-down menu, change the browser choice from "IDE Default" to your preferred browser; on the lab workstations, the browser should be preset to Firefox.  From the "**Run**" menu, choose "**Clean and Build**", then open the "**Run**" menu again and choose "**Run Project.**"  If Tomcat is configured correctly within NetBeans, additional tabs should appear in the "**Output**" window for the Apache Tomcat service and logs.  ***At this point, you might get a prompt from Windows Firewall; if you do, select "Allow Access."***  Shortly afterward, a Web browser should open and a placeholder web page containing the text " **TODO write content**" should appear.

6. This indicates that the application was successfully deployed to Tomcat.  Close the browser, and in the "**Apache Tomcat or TomEE**" tab in the "Output" window, click the red "**Stop**" button to stop the Tomcat service.  Close NetBeans.

[**Mac**](https://jsu.instructure.com/courses/10254/pages/netbeans-8-dot-2-setup-instructions)**OS X**

1. Launch NetBeans 8.2.  From the "**Tools**" menu, choose "**Services.**"  
2. Click the "**Add Server ...**" button in the lower left.  In the "**Choose Server**" dialog box, choose "**Apache Tomcat or TomEE**" from the list of servers and click "**Next.**"

3. In the "**Installation and Login Details**" dialog box, enter the following location in the "**Server Location**" field:

**/usr/local/Cellar/tomcat@8/8.5.38/libexec**

(Depending on your installation of Tomcat, the version number may be slightly different, so confirm the location and make any necessary changes.)

In the "Username" and "Password" fields, enter the username "**admin**" and the password "**3^3@yer$**".  (Recall that these are the same credentials given in the Apache Tomcat installation instructions.)  Click "**Finish.**"

4. From the "**NetBeans**" menu, choose "**Preferences**."  In the "**General**" tab, look for the "**Proxy Settings**" area, and ensure that the "**No Proxy**" option is selected.  Click "**Apply**", then "**OK.**"

5. Now, we must test starting and stopping the server, and deploying applications to the server, from within NetBeans.

From the "**File**" menu, choose "**New Project.**"  In the "**New Project**" dialog box, choose "**Java Web**" from the list of categories on the left, and "**Web Application**" from the list of projects on the right.  Click "**Next**", accept the default project name and location, then click "**Next**" again.  In the "**Server and Settings**" dialog box, choose "**Apache Tomcat or TomEE**" from the list of servers.  Click "Finish" to [create](https://jsu.instructure.com/courses/10254/pages/netbeans-8-dot-2-setup-instructions) the project.

6. Click the "Browser" button in the toolbar (to the left of the "Build Project" button), and in the drop-down menu, change the browser choice from "IDE Default" to your preferred browser; on the lab workstations, the browser should be preset to Firefox.  From the "Run" menu, choose "**Clean and Build**", then open the "**Run**" menu again and choose "**Run Project.**"  If Tomcat is configured correctly within NetBeans, additional tabs should appear in the "**Output**" window for the Apache Tomcat service and logs.  Shortly afterward, a Web browser should open and a placeholder web page containing the text "**TODO write content**" should appear.

7. This indicates that the application was successfully deployed to Tomcat.  Close the browser, and in the "**Apache Tomcat or TomEE**" tab in the "**Output**" window, click the red "**Stop**" button to stop the Tomcat service.  Close NetBeans.

# Data Exchange Library Setup Instructions

**Libraries.zip – located in the root of the repository**

In most of my projects, I have used **[OpenCSV](http://opencsv.sourceforge.net/" \t "_blank)**[(Links to an external site.)](http://opencsv.sourceforge.net/" \t "_blank) and its [API (Links to an external site.)](http://opencsv.sourceforge.net/apidocs/) to process CSV data, and [**json-simple** (Links to an external site.)](https://code.google.com/archive/p/json-simple/) to process JSON data.  The necessary libraries for Java (in the form of JAR files) can be found in the attached archive.

Before we can use these libraries, it will be necessary to install them into the JDK.  If we wish to use them in an IDE (such as NetBeans), it will also be necessary to [create](https://jsu.instructure.com/courses/10254/pages/data-exchange-library-setup-instructions) [library](https://jsu.instructure.com/courses/10254/pages/data-exchange-library-setup-instructions) entries for them in the IDE.  The instructions below will walk you through both processes.

**NOTE**: Before you begin, open the "**Tools**" menu in NetBeans and [choose](https://jsu.instructure.com/courses/10254/pages/data-exchange-library-setup-instructions) "**Libraries**".  If you already see entries for "**OpenCSV**" and "**json-simple**", then you probably installed these libraries on your workstation already for a previous class, such as CS 310.  If so, you do not need to perform the setup again; simply use the versions of the libraries that you already have.

To [install](https://jsu.instructure.com/courses/10254/pages/data-exchange-library-setup-instructions) the libraries into your JDK, open the Windows Explorer, browse to the "**C:\Program Files\Java**" or "**C:\Program Files\AdoptOpenJDK**" folder, then open the subfolder containing the most recent version of the JDK installed on your workstation.  All three of the JAR files from the attached archive should be copied into the "**<java\_home>\jre\lib\ext**" subfolder of your JDK.

Once you have installed the JARs, open NetBeans and create two new libraries, one for OpenCSV and another for json-simple.  Choose "**Libraries**" from the "**Tools**" menu, click the "**New Library**" button, enter "**OpenCSV**" as the name, then click "**Add JAR/Folder**" and select two of the JAR files that you installed into the JDK in the previous step, "**opencsv-4.0.jar**" and "**commons-lang3-3.6.jar**" (both are required).  Click "**OK**" to create the library.  Then, repeat the process for json-simple: add the "**json-simple-1.1.1.jar**" file to the library, and use "**json-simple**" as the library name.