THE UNIVERSITY OF SYDNEY

School of Computer Science
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COMP5338: Advanced Data Models **Sem. 2/2020**

Week 6: Neo4j Set Up Guide

24.09.2020

1 Introduction

Neo4j is the graph database we will use in a few labs and also in the second assignment. Neo4j offers products at enterprise and community level. We use the latest community edition in this course.

2 Prepare Required Software

Neo4j is written in Java and needs matching Java version to run. Check the software requirements page to find the supported Java version corresponding to your OS type and version. You can skip to next step if you already have the required Java package installed on your computer.

The following is a brief installation guide for `ZuluJDK 11`, which is the supported Java package in nearly all OS except SUSE.

2.1 Install ZuluJDK on macOS

1. Download the correct installation file from Zulu download page. Scroll down to find the download section and select the version and option as shown in Figure 1. We recommend using the `.dmg` option for Mac users.
2. Follow the installation guide to install it.
3. Check that java is correctly installed by running `java -version` on a shell window. You should see print out similar to Figure 2

Note if you have previous installed Java with different version, you may need to set the `JAVA_HOME` variable pointing to the correct version for Neo4j to start properly.

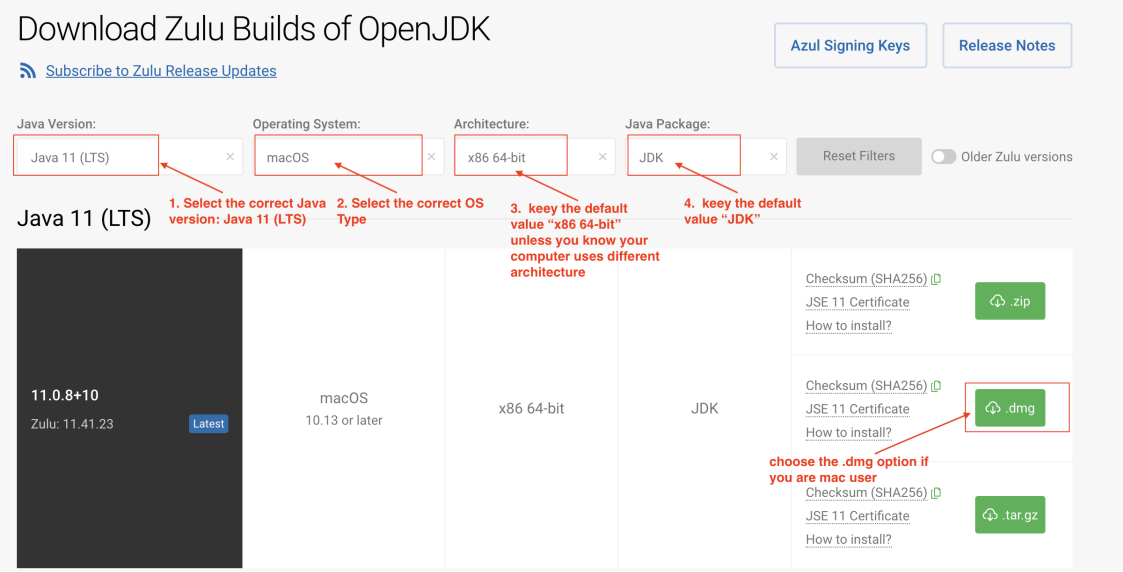

Figure 1: Zulu Download Page for macOS

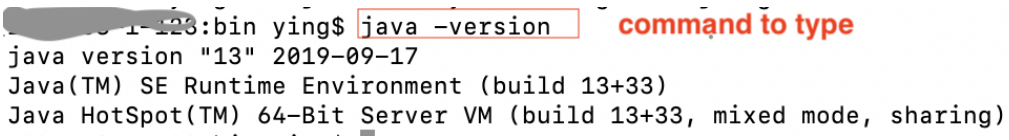

Figure 2: Command Line Java Version Check for macOS

2.2 Install ZuluJDK on Windows

The instructions here assume you are a beginner user and do not need to use other Java versions. For advanced user, please use your preferred the option for maintaining multiple Java versions.

1. Uninstall stale Java versions. You need to uninstall old java versions, and delete related folders. Also, you need to make sure to delete the environment variables for previous Java installations.

2. Download the correct installation file from Zulu download page. Scroll down to find the download section and select the correct version as shown in Figure 3. Please download the *.msi package, which is easier to install.

3. Follow the Section 2.c in the installation guide to install it. We suggest you keep everything as default, if you are a beginner.

4. Check that java is correctly installed by running `java --version` on a cmd window. You should see print out similar to Figure 4

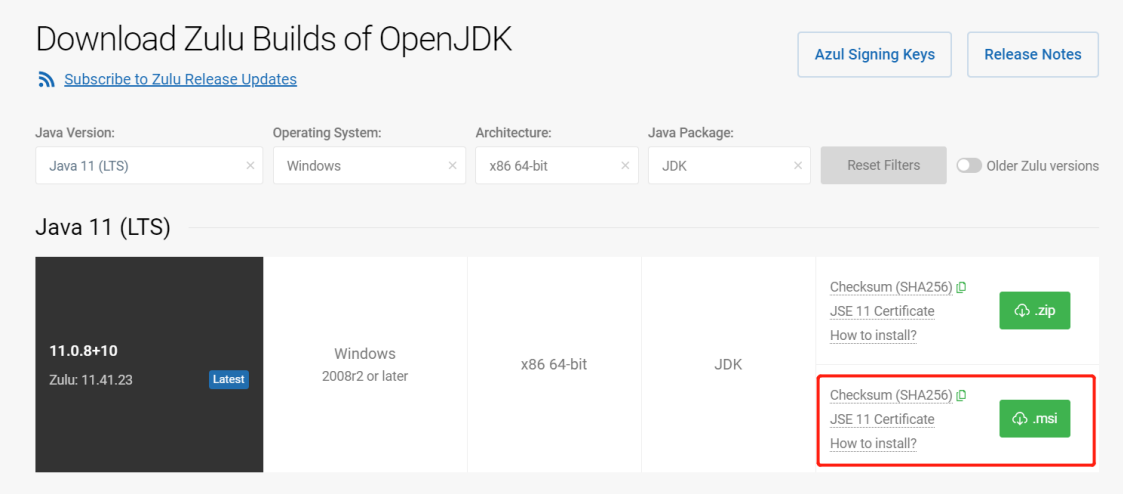

Figure 3: Zulu Download Page for Windows

```
>java --version
openjdk 11.0.8 2020-07-14 LTS
OpenJDK Runtime Environment Zulu11.41+23-CA (build 11.0.8+10-LTS)
OpenJDK 64-Bit Server VM Zulu11.41+23-CA (build 11.0.8+10-LTS, mixed mode)
```

Figure 4: Command Line Java Version Check for Windows

3 Install Neo4j Community Edition 4.1.1

The latest Neo4j Community Edition is 4.1.1 when this guide was prepared. You may install the current latest one at your installation time. They all run on Windows, macOS and Linux operating systems. The Community Server Download Page provides download links based on different OS types. Click the corresponding link to download either a tar or gz file (see Figure 5). Once downloaded, extract the content and move the entire folder under your home directory or another place on your file system. The extracted folder is called `neo4j-community-4.1.1` and we will refer to it as the home directory of neo4j.

4 Configure APOC library

Neo4j supports user-defined procedures and functions to extend the functionality of its Cypher query language. A set of common procedures and function are provided by Neo4j and packaged in the APOC library. One essential functionality is the ability to import data from common formats including JSON and CSV. This is provided as part of the `APOC core` library that comes with the installation. Some configuration is needed to enable the `APOC core` library and certain functionalities.

1. Copy the `APOC core jar` file to the `plugins` sub-directory. The `APOC core jar` file

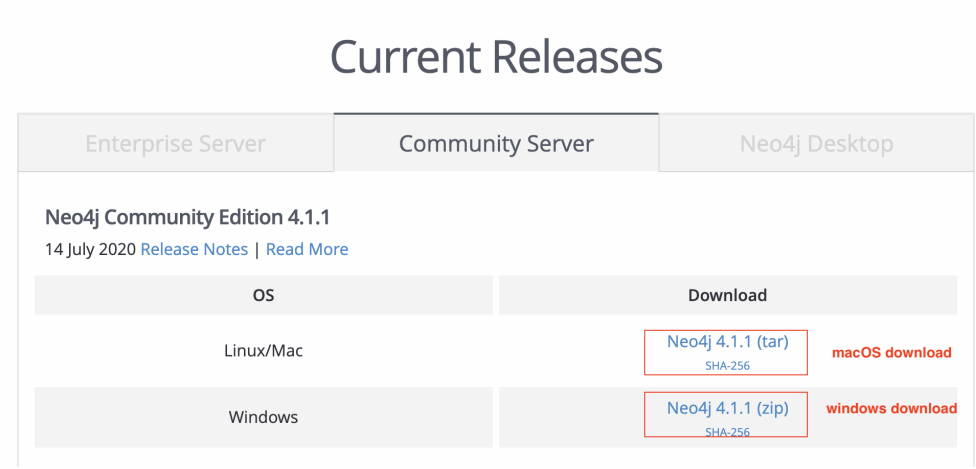

Figure 5: Neo4j Community Edition Download Page

is originally put in the `labs` sub-directory of the neo4j home directory. It needs to be copied to the `plugins` sub-directory. The Mac/Linux command is as follows, assuming your present working directory is the neo4j home directory:

```
cp labs/apoc-4.1.0.1-core.jar plugins/
```

2. Create APOC configuration file to allow importing from file. Neo4j configuration files should be stored in sub-directory `conf`. A freshly installed server only has one file `neo4j.conf` in this directory. We need to create a configuration file `apoc.conf` for APOC to allow importing from file. The file should contain the following property:

   ```
   apoc.import.file.enabled=true
   ```

   The Mac/Linux command for creating a file and adding a line is as follows:

   ```
   echo "apoc.import.file.enabled=true" > apoc.conf
   ```

   Windows users can use any text editor to accomplish the same.

5 Start Neo4j Server on macOS

The download page contains simple instructions on starting Neo4j server. It is preferred to start Neo4j as background process. For Mac user, open a shell window and navigate to the home folder of neo4j. Run the following command to start neo4j as background process. You will see a few lines of message similar to Figure 6.

```
bin/neo4j start
```

```
[redacted]3:neo4j-community-4.1.1 ying$ bin/neo4j start
Directories in use:
  home:         /Users/ying/neo4j-community-4.1.1
  config:       /Users/ying/neo4j-community-4.1.1/conf
  logs:         /Users/ying/neo4j-community-4.1.1/logs
  plugins:      /Users/ying/neo4j-community-4.1.1/plugins
  import:       /Users/ying/neo4j-community-4.1.1/import
  data:         /Users/ying/neo4j-community-4.1.1/data
  certificates: /Users/ying/neo4j-community-4.1.1/certificates
  run:          /Users/ying/neo4j-community-4.1.1/run
Starting Neo4j.
Started neo4j (pid 66042). It is available at http://localhost:7474/
There may be a short delay until the server is ready.
See /Users/ying/neo4j-community-4.1.1/logs/neo4j.log for current status.
```

Figure 6: Neo4j Start Command and Output for macOS

The command to stop neo4j is:

```
bin/neo4j stop
```

6 Start Neo4j Server on Windows

The download page contains simple instructions on starting Neo4j server. Open a cmd window and navigate to the home folder of neo4j. Run the following command to start neo4j. You will see a few lines of message similar to Figure 7.

```
bin\neo4j console
```

```
2020-09-24 00:30:05.102+0000 INFO  Starting...
2020-09-24 00:30:07.229+0000 INFO  ======== Neo4j 4.1.2 ========
2020-09-24 00:30:11.648+0000 INFO  Performing postInitialization step for component 'security-users' with version 2 ar
status CURRENT
2020-09-24 00:30:11.648+0000 INFO  Updating the initial password in component 'security-users'
2020-09-24 00:30:12.258+0000 INFO  Bolt enabled on localhost:7687.
2020-09-24 00:30:12.937+0000 INFO  Remote interface available at http://localhost:7474/
2020-09-24 00:30:12.937+0000 INFO  Started.
```

Figure 7: Neo4j Start Command and Output for Windows

7 Access Neo4j's Web Interface

Open a browser and access Neo4j's web interface at `http://localhost:7474`. The web interface is the preferred and primary user interface of Neo4j. It allows you to run `Cypher` commands to retrieve and update a graph; it also allows you to visualize the graph with customized styles.

When connecting to Neo4j, you will be prompted for `username` and `password`. If it is your first time connecting to Neo4j, you should use the default `username/password` pair "neo4j/neo4j" (see Figure 8. You will be asked to change the password after logging in. Remember the password for later use.

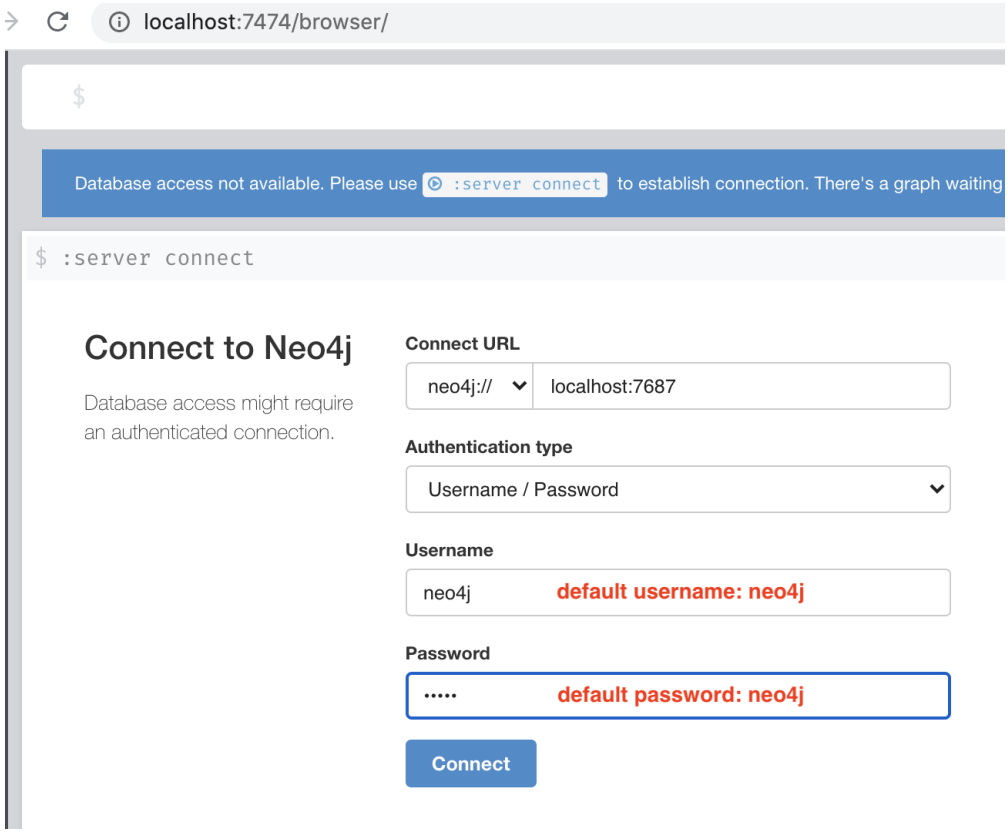

Figure 8: Neo4j Browser Home Page