Neo4j

March 2021

1 Neo4j Installation

- Ubuntu 20.04 is best since it supports Java and JDK 11 which helps to run Neosemantics library. The **desktop or browser version doesn't work**

- Installing Neo4j 4.2.3 on Ubuntu 20.04

- Steps to follow, (sub-bullets are to be typed in terminal) [1]

  1. The below command list the available Java versions, by default Ubuntu 20.04 comes with Java 8 and Headless Java 11, 12, 13, 14.
     - echo "deb http://httpredir.debian.org/debian stretch-backports main" — sudo tee -a /etc/apt/sources.list.d/stretch-backports.list

  2. Update the packages
     - sudo apt-get update

  3. Install Java-11
     - sudo apt-get install openjdk-11-jre

  4. List the java assigned as default (PS: update-java-alternatives –list is mentioned in the website since we used sudo apt-get install. We need to use the below one instead)
     - sudo apt-get install –list

  5. If Java 11 is not set as default set it manually
     - sudo update-java-alternatives –jre –set java11name

  6. Get the available Neo4j version that is stable for Ubuntu 20.04 (execute the below command one by one)
     - wget -O - https://debian.neo4j.com/neotechnology.gpg.key — sudo apt-key add -
     - echo 'deb https://debian.neo4j.com stable 4.2' — sudo tee -a /etc/apt/sources.list.d/neo4j.list
     - sudo apt-get update

  7. List the Neo4j stable version

– apt list -a neo4j

8. Install Neo4j 4.2.3
   – sudo apt-get install neo4j=1:4.2.3

9. Neo4j is successfully installed, now start the database
   – service neo4j start

10. Open the following in browser and set the password
    – http://localhost:7474/browser/

2 Neosemantics Installation

- After installing successfully the Neo4j by the above method we can install neosemantics library (This doesn't work for desktop or browser version)

- The steps involved are [2]

  1. Download the version 4.2.0.0.jar Neosemantics file [3] [Link]
  2. The file is in Downloads folder so move it to plugins folder in Neo4j [4] using the following command
     – sudo mv /Downloads/file name */var/lib/neo4j/plugins*
  3. Edit the configuration file to add the plugin, which is done by copying the following "dbms.unmanaged_extension_classes=n10s.endpoint=/rdf" to the configuration file open using
       – sudo gedit /etc/neo4j/neo4j.conf
  4. The above command opens the file so add the following line at the end of the file, save it and close.
  5. Restart the neo4j using the following command
     – service neo4j restart

- Neosemantics library is added successfully and ready to use it.

3 APOC Installation

- After installing successfully neosemantics library need to install APOC very necessary (This doesn't work for desktop or browser version)

- The steps involved are [2]

  1. Download the version 4.2.0.2-all.jar APOC file [5] [Link]
  2. The file is in Downloads folder so move it to labs folder in Neo4j [4] using the following command (The file location is given wrongly in the Neo4j website)
     – sudo mv /Downloads/file name */var/lib/neo4j/plugins*

3. Restart the neo4j using the following command
    – service neo4j restart

- APOC library is added successfully and ready to use it.

4 Importing wikidata to Neo4j [6] [7]

- Start neo4j

  – service neo4j start

- Open the following in browser and enter the password

  – http://localhost:7474/browser/

- Initiate the Neosemantics library

  – Call n10s.graphconfig.init()

- Query the Wikidata related to the subject (in our case it is car, crash analysis, vehicle etc)

- Its useful to Query the wikidata from Wikidata Query Service at it is handy and good to debug [Link]

- The query is done using SPARQL

```
SELECT *
WHERE {
    ?item wdt:P31 wd:Q1420 .          #Instance of cars
  }
```

- Where P is the property, P31 gives the instance of following class where Q1420 is the class for Cars in Wikidata.

- The class/item in the Wikidata are acessed by the Q number.

- The above code snippet look for instance of cars in the whole Wikidata database.

- The above is an example of snippet to get some data this can be build more that can be learnt in the neo4j guide [Link]

- Once the query is done, it can be fetched in neo4j by the following snippet

```
CALL n10s.rdf.preview.fetch(
"https://query.wikidata.org/sparql?query=" +
apoc.text.urlencode(sparql),"JSON-LD",
{ headerParams: { Accept: "application/ld+json"} ,
    handleVocabUris: "IGNORE"})
YIELD nodes, relationships
RETURN nodes, relationships
```

References

[1] Neo4j, "Neo4j Linux Installation (Debian)," 2021. Accessed on: 2021-03-15. [Online].

[2] Neo4j, "Neosemantics," 2021. Accessed on: 2021-03-15. [Online].

[3] Neo4j, "Neosemantics download file," 2021. Accessed on: 2021-03-15. [Online].

[4] Neo4j, "Neo4j doc," 2021. Accessed on: 2021-03-15. [Online].

[5] Neo4j, "APOC download file," 2021. Accessed on: 2021-03-22. [Online].

[6] Towardsdatascience, "Part 1: Import WikiData to Neo4j with Neosemantics library," 2021. Accessed on: 2021-03-22. [Online].

[7] Neo4j, "How to import Wikidata into Neo4j," 2021. Accessed on: 2021-03-22. [Online].