# Database Assignment Report

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Solution link : https://github.com/Intiggers/FinalProject

## Which database engines are used

Neo4j & MySql

## How data is modeled

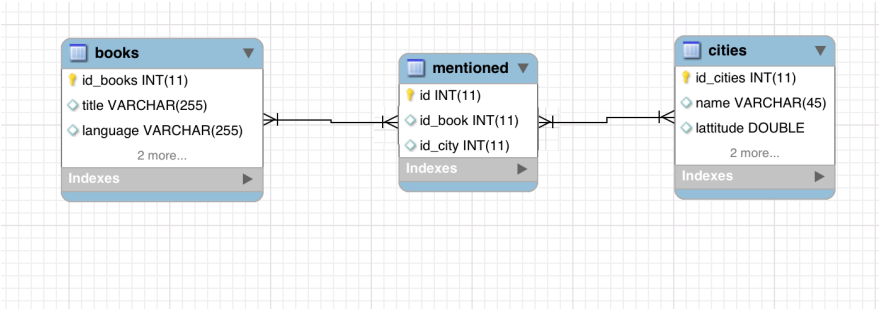


*figure 1 ER Diagram for MySql*

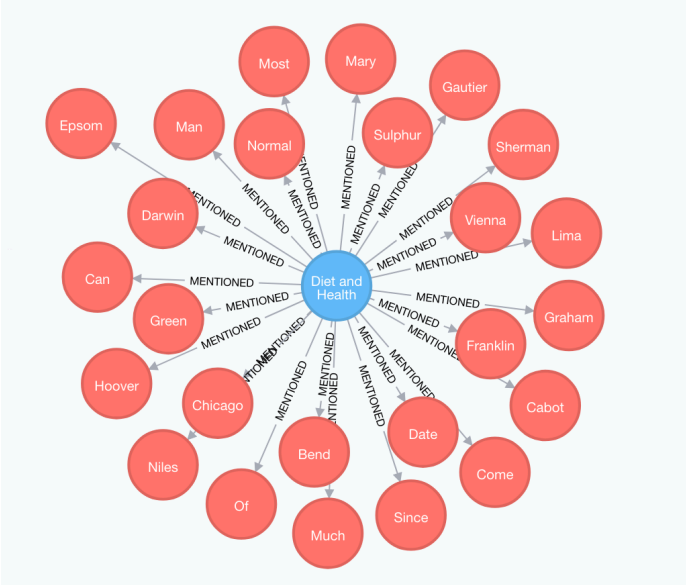


*figure 2 Neo4j Model*


*figure 3 Relationship*


*figure 4 Node City*

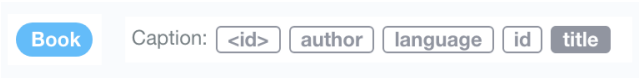


*figure 5 Node Book*

## How data is imported.

For scraping we decided to use create our own Java algorithm which produces the desired text files. Data were imported from csv files directly to dbs. In case of Neo4j we have seen a huge difference on importing the data without and with indexing before actual import occurred. While importing into MySql we witnessed similar difficulties. At first when we tried to import into MySql we used regular insert statement which as seen was not efficient enough. With usage of multi valued import we were able to reduce import time from hours into couple of seconds.

Algorithm repository:
https://github.com/Stargarth/FinalProjectTestandDB/tree/master/DBproject

## Behavior of query test set

In our benchmark classes, we have a set of inputs, 5 for each query. Same input sets are used for Neo4j as well as MySql.

Average execution times:

| Query | Neo4j | SQL |
|---|---|---|
| Query no. 1 | 298ms | 645ms |
| Query no. 2 | 51ms | 669ms |
| Query no. 3 | 294ms | 761ms |
| Query no. 4 | 5424ms | 1301ms |

Medians:

| Query | Neo4j | SQL |
|---|---|---|
| Query no. 1 | 364ms | 641ms |
| Query no. 2 | 86ms | 660ms |
| Query no. 3 | 30ms | 666ms |
| Query no. 4 | 3887ms | 1577ms |

## Your recommendation, for which database engine to use in such a project for production.

For such a project in production we recommend to use Neo4j. It is faster than MySQL in all cases beside the final query. We think that fourth query execution time can be improved by finding better framework or implementing only the functionality that is required in order to fulfill the requirements.  It is also easier to work with using java.