CPSC 476 - Back-End Engineering - Spring 2018

Project 3, due April 17

Introduction

In this project, you will port the MiniTwit API to Cassandra, a wide-column NoSQL database.

Project Code

If you completed Project 2, you should build on that foundation (though you may choose to run single instances of `minitwit.py` and `mt_api.py` rather than a load-balanced cluster). If necessary, however, you may start from Project 1's codebase.

Test Environment

You may use any platform for development and testing, and NGINX is partially supported on Windows, but note that per the Syllabus the test environment for projects in this course is the Ubuntu MATE VM for available from http://michael.shafae.com/#resources.

Install Cassandra using the instructions for installation from Debian packages. Note that Cassandra is fairly resource-intensive, and you may notice a performance impact. If you are running the Ubuntu MATE VM on a host machine with enough RAM, consider allocating additional memory to the VM.

Starting and Stopping Cassandra

The Cassandra server will start as soon as the package is installed, but you may not want to leave it running at all times. To stop the server, use the following command:

```
$ sudo systemctl stop cassandra
```

When you want to use Cassandra, you can start it again with

```
$ sudo systemctl start cassandra
```

You can check to see if Cassandra is running with

```
$ sudo systemctl status cassandra
```

Note that once the `systemctl start` command has been executed, it may take a few minutes before Cassandra is ready to accept connections. If you run the cqlsh command immediately

you may receive an error message such as `'Unable to connect to any servers'`. If `systemctl status` shows Cassandra running, wait a bit and try again.

Cassandra is configured to start automatically when the VM boots. If you plan to start and stop Cassandra manually, you can use the following command to disable this behavior:

```
$ sudo systemctl disable cassandra
```

Note that the `systemctl disable` command only affects what will happen when the system boots; it will not stop Cassandra if it is currently running.

Python Cassandra Driver

Install the DataStax Python Cassandra Driver, using the instructions provided. Do *not* install the `python-pycassa` driver package included with Ubuntu; it does not support CQL.

Cassandra Flask Extension

You may wish to install and use the Flask-Cassandra extension to configure your Cassandra connection, but this is not a requirement.

Database Population

You will need to update your `initdb` and `populatedb` Flask CLI commands to connect to Cassandra and use CQL.

Cassandra Data Model

Create a single keyspace and at least one column family. (You may wish to create a separate column family to store login information.) The data from the SQL `followers` table should be in a column containing a collection.

The Data Modeling portion of the Cassandra documentation is, sadly, missing. But recall the advice from Chapter 8 of the textbook: identify the access patterns for each MiniTwit API call, then create additional indexes as necessary for any queries not based on primary key.

Submission

Turn in the code for your project by placing `minitwit.py`, `Procfile`, modified configuration files from `/etc/nginx`, and any other relevant files in the `project2/` subdirectory of the folder that was you on Dropbox. If you needed to modify `mt_api.py`, include the updated code and documentation. You may work alone, or make a single submission for a team of 2-3 students. If you work in a team, make only one submission.

To complete your submission, print this sheet, fill out the spaces below, and submit it to the professor in class by the deadline. Failure to follow the instructions exactly will incur a **10%** penalty on the grade for this project for all students on the team.

Project Submission

CPSC 476, **Section 1**

Project Number _____

Names of up to three students for this submission

1. _____
2. _____
3. _____

CSUF email of the Dropbox account containing the project files for this submission

_____@csu.fullerton.edu

Comments on your submission

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____