IoT (100 points)

Due Date: Dec 12, 2023 @ 11:55 PM

For this part of the assignment, you will modify three python scripts. One will act as a server that will connect to a MongoDB database and download some data and parse it, the other will query the server for the resulting data.

Note: Please use DataNiz to generate data for your server, and compute the result in real-time.

1. Download all of the files associated with this project and put them in a folder that you can easily access.
2. If you don't already have an environment that can run python, please acquire one for this project. As a student, you should have free access to PyCharm, but Visual Studio Community has free Python tools, and Visual Studio Code also has free Python tools available. There are plenty of other tools, so feel free to choose whichever one you feel most comfortable with as long as it can run Python3.
3. Read and understand the Python files that you've been given. You don't need to fully understand all of the syntax to do this assignment, but you will need to set up a proper TCP connection between the two programs and send data between them. Please reference the code that you wrote for the last assignment, and use the virtual machines that you created for the last assignment.
4. Set up your server and client to transmit through your local machine. You can choose what ports to use, but use either "localhost" or "127.0.0.1" to connect locally between the two applications.
5. Run your scripts, and get data from your MongoDB database to display which freeway has the best average time within the last five minutes.
   Hint: The freeway that has the best average time within the last five minutes is the one that has least average traffic.
6. After you are able to run the program locally, deploy your scripts to Google Cloud. Verify that they still work on the cloud.
7. Make sure to demo your program, and submit your screenshots and program files online.

The program execution should go as follows:

Step 1: your client establishes the port and IP address of your server.

Step 2: Your client sends a packet of data to query the server. (What you send isn't as important as successfully sending something)

Step 3: Your server connects to and downloads the current data from your MongoDB server

Step 4: Your server figures out which sensor has the best average time in the past <u>five minutes</u> and sends the name of the associated road to the client. Keep in mind that this is temporal data; in other words, the payload will have a timestamp, and your server will have a different timestamp. You may need to do some conversions in order to match the time. Also, you need to count the moving average.

Step 5: Your client prints out which road is the best one to take given your current data

CECS 327 Intro to Networking and Distributed System   **Assignment 8**

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Deliverables:

- Your grade will be determined based on the accuracy of your algorithm.
- A screenshot of both your server and client successfully running on the cloud and communicating with each other
- Your client, server, and MongoDBConnection Python files
- Please remember that you will need to demo this project with either your professor or your ISA. Please check online for available times to do this.