Location Identification Problem

Lenovo Interview for Machine Learning Engineer Role

Test prepared: 11/21/2017

# Data

* **user\_location.txt**. This text file has 160 (latitude, longitude) pairs that correlate to the GPS locations John Doe had physically been in 48hrs. Data is not in time order.
* **nearby\_establishments.csv**. This semicolon-delimited file has all the information of the establishments (e.g. latitude, longitude, name and types) in the area where John had been to. The file does not include specific information about which exact establishment John had been to.

# Questions

1. Analyze the data and figure out where John had been to most likely in the last 48hrs – this is an open-ended real world problem. Thought process is important.
2. Implement one or more criteria that you can come up with to select the most likely establishment(s) John had been to – using the programming language you prefer within the list [Python, Java]. The implementation is expected to provide a function that takes in a pair of latitude, longitude as input and returns a list of establishment(s) with ranking scores, with the more likely establishment(s) at the top of the list.
   * While you can use the GPS coordinates in **user\_location.txt** to implement/validate your function, we may test the function with new coordinates that are not in that file.

# Deliverables

1. A complete, runnable program that does the functionality mentioned in Question #2
   * Include required libraries with the source code of the program. If necessary, provide an instruction on how to set-up the working environment and run the program.
2. A report to describe the ideas and explain the pros and cons of each approach.

# Deadline

Submission can be sent to the email [xxu1@lenovo.com](mailto:xxu1@lenovo.com) no later than 11/23/2017 23:00 (EST). If the additional libraries are too large to be attached to the email, then their download links can be provided.

For any concerns/questions, you can make assumption or email us and we will try to respond in a timely manner.

Good luck!

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