Vendor Qualification System (Peter Le)

Required Libraries

pip install pandas
pip install scikit-learn
pip install flask
pip install requests

File Overview

main.py - ingests data and scores it
tests.py - runs tests among different categories

main.py
Task 1

- Loads vendor dataset and turns it into pandas dataframe.
- Assigns a custom category column to the right of the dataframe.
    - Considers descriptions with keywords to classify different categories.
- Combines features and description into a singular column to be vectorized.

Task 2

- Computes TF-TDF vectors using TfidfVectorizer library.
    - Gives numerical weights of vendors using popular vectorization technique.
- Converts user query into query vector.
- Computes cosine similarity between query and vendors.
    - Angle between two vectors determines correlation between the vectors.
- Apply threshold filter of 0.01 (best threshold out of experimentation).
    - If no results appear, set the threshold to 0.

Task 3

- Compute a composite score.
    - Apply a 0.7 rating weight and 0.3 similarity weight (popular heuristic weights that value rating).
- Sort vendors by score (descending).
- Return top 10 vendors

Task 4

- Created flask framework.
- Endpoint - POST /vendor_qualification.

- Used port 8000 (5000 did not work with my macbook).

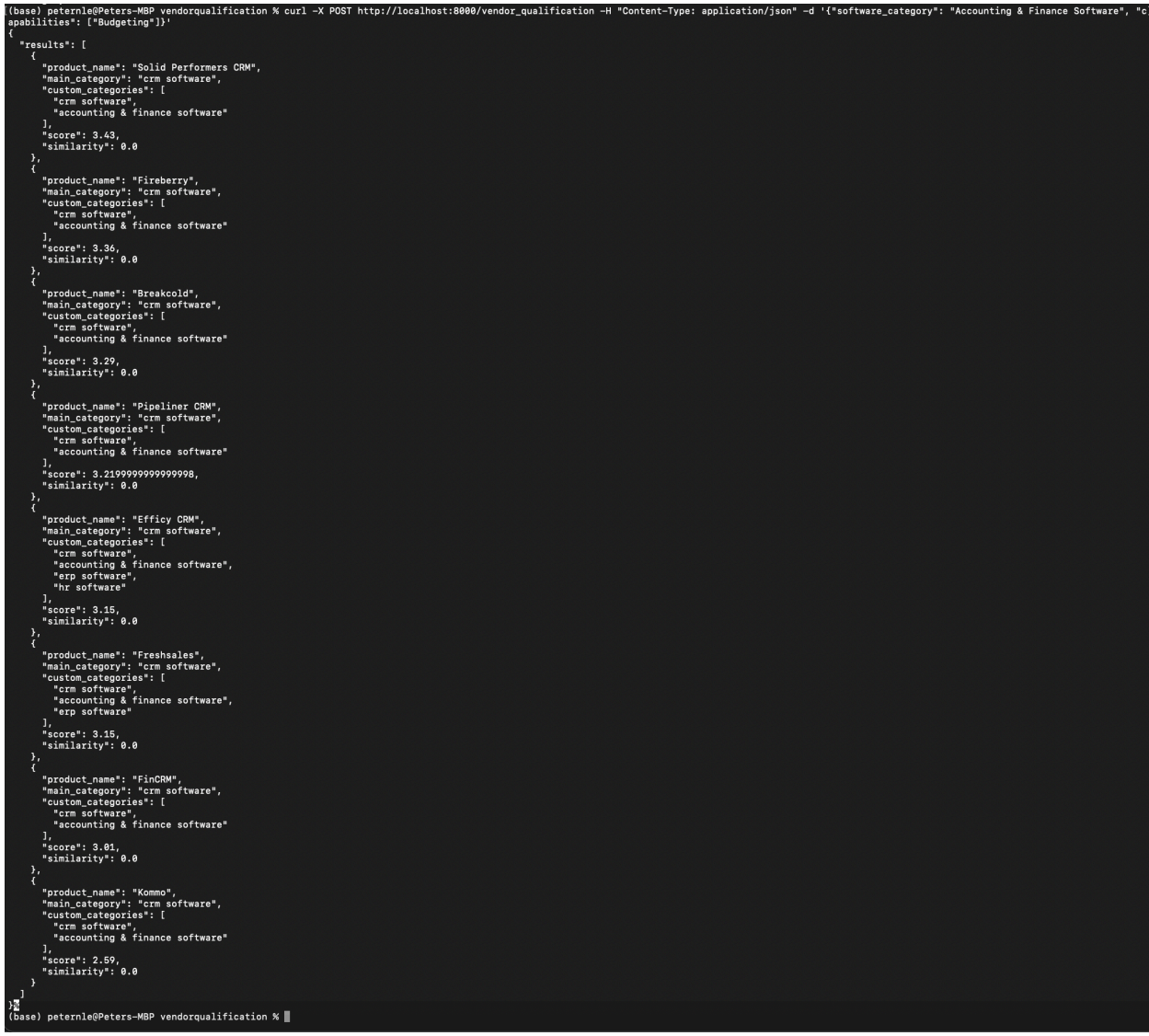
Testing

Two Ways to Test

1. python tests.py
    a. Sends HTTP Post requests to Flask API with requests library.
    b. Sends post request with test inputs
    c. Parses json response
    d. Returns number of results with vendor names, classified custom categories, score, and similarity
    e.

2. curl -X POST http://localhost:8000/vendor_qualification -H "Content-Type: application/json" -d '{"software_category": "Accounting & Finance Software", "capabilities": ["Budgeting"]}'
    a. 8000 instead of 5000

b.



Challenges

- Finding a fitting threshold that would guarantee results.
- Finding fitting features and experimenting with them.
- Learning Flask API
- Vectorization research
- Thinking of keywords

Potential Improvements

- Experiment more with the rating and similarity weights.
- Docker support.
- More unit tests.

- Can Vectorization algorithm detect keywords via synonyms?
- Possible dynamic threshold.