Yelp Healthy Restaurant Engine

CSE D 515 - Software Design For Data Science
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Sepi Dibay, Natasha Halfin, Harsha Koonaparaju, Xiaoyu Lin, Liem Luong, Divya Pandey

Project Introduction

Background. Describe the problem or area being addressed.

Background & Problem Addressed

- Increasing consideration of healthy lifestyle and diet
- Growing demand for healthy restaurants, but few search engines incorporate this dimension
- **Project goal:** provide a way for users to discover healthy restaurants within the existing Yelp directory
- **Methodology:**
    - Train text classification model from Nutritionix training data
    - Apply model to photo captions from Yelp dataset to determine if items are healthy
    - Generate health score for restaurants based on the model results
    - Surface results in app where eaters can search for nearby healthy restaurants

Data Sources

Data Sources:

- Yelp open dataset : Contains business information of 209k+ restaurants in 10 cities, 8M reviews and 200k pictures
- Nutritionix API : Contains nutrition information from chain restaurants across the US. We used this to train our classification model that assigns healthy or unhealthy labels.

Limitations:

- Generated labels in training data based on nutritional fields; these were absent in the Yelp data
- Final predictions not necessarily accurate from a nutritional perspective

Use Cases

- **Use Case 1:** user wishes to find a healthy restaurant in close proximity by filtering on city or state
- **Use Case 2:** user wishes to find a healthy restaurant in a specific category, i.e. Greek food or a restaurant that serves vegetarian food
- **Use Case 3:** user wants to find healthy restaurants to have a health score of 70% or higher

Software Design

Data Processing

Input:
Yelp Data and Nutritionix Data

Output:
Cleaned tokenized datasets
- Yelp tokenized data
- Nutritionix tokenized data

Text Classification

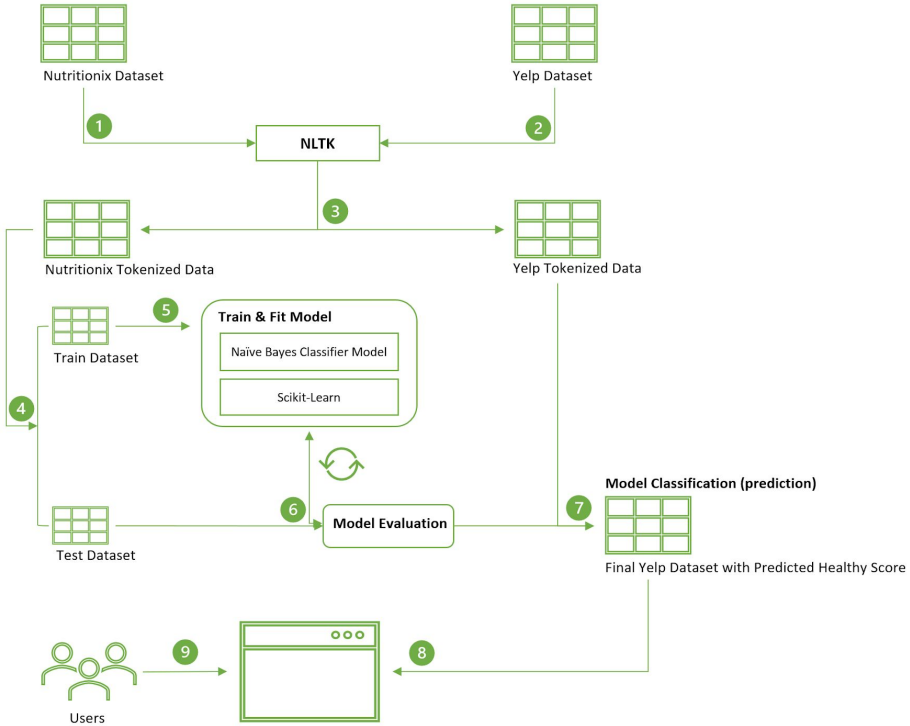
Input:
- Yelp tokenized data
- Nutritionix tokenized data

Output:
Final predicted healthy score of all Yelp restaurants

Web UI

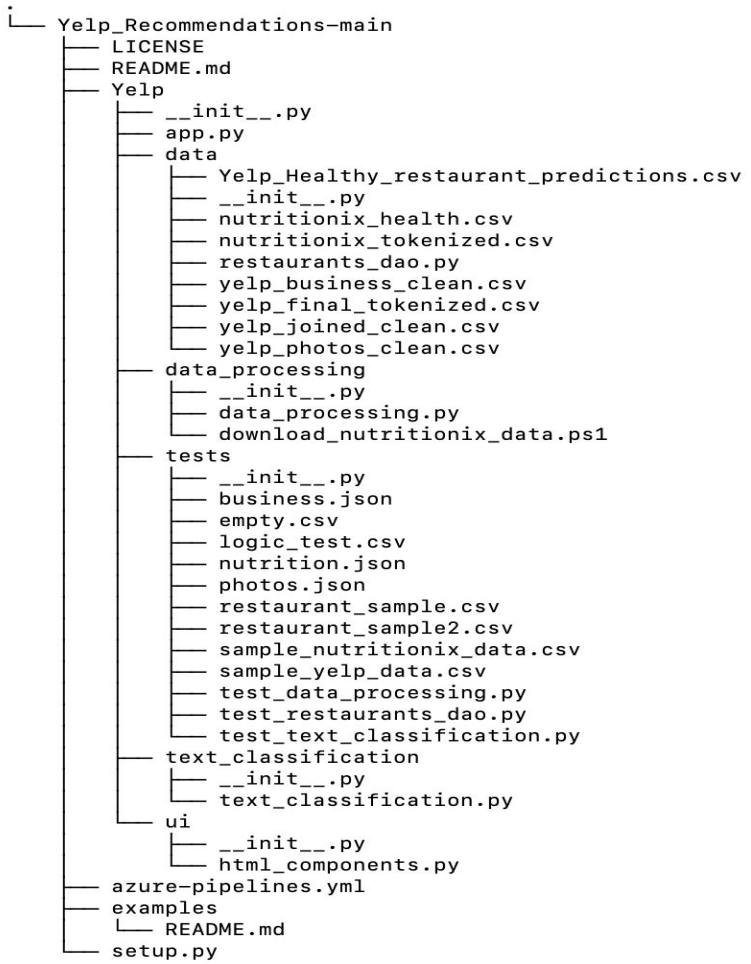
Input:
- Direct users input on the web UI
- Cached predicted final Yelp dataset

Output:
Display the restaurants with predicted healthy score



Project Structure

Github Repository
https://github.com/nhalfi/Yelp_Recommendations



Demo

Lessons Learned and Future Work

Lessons

- Can be creative with choice of training data
- Proper package structure
- Test-driven development
- Setting up continuous integration
- Pull often and double-check before you push

Future Work

- Find additional training datasets closer to Yelp data
- Image classification of photos in addition to text classification

Q&A

Appendix

Data Diagram

- An operation is performed on these two separate data segments from Yelp into a comprehensive set for our model. Below is a data diagram of this Yelp joined dataset.