Yelpify

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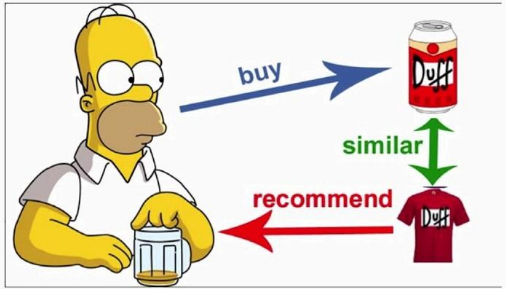
Background



- The Yelpify team builds a recommender system that make recommendations for users and merchants.
- How it works:
  - Given a user, the system recommends a desired number of businesses that the model thinks the user will like;
  - Given a business, the system recommends a desired number of users that the model thinks will most likely favor this business.
- Special about Yelpify:
  - We make recommendations for both existing and new users (and vice versa for businesses);
  - Model is generalizable to a wide range of applications, such as movie recommendation, or hotel recommendation.
  - Strong model performance: powerful and fast

Data: Yelp academic datasets

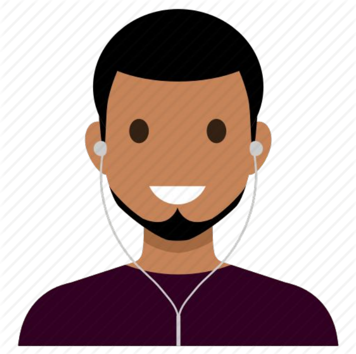
- Review.json
  - business ID, review ID, user ID, text of review, rating
- Business.json
  - features about the business, e.g. location, name, whether open or not
- User.json
  - features about the user, e.g. count of reviews, average ratings given
- Data processing:
  - Join by user ID and business ID
  - Clean null and duplicate values
  - Reduce size

Use cases

For a user:

“I’d like to know what to eat based on my past reviews.”

“I’d like to know what to eat based on my demographics.”



For a business:

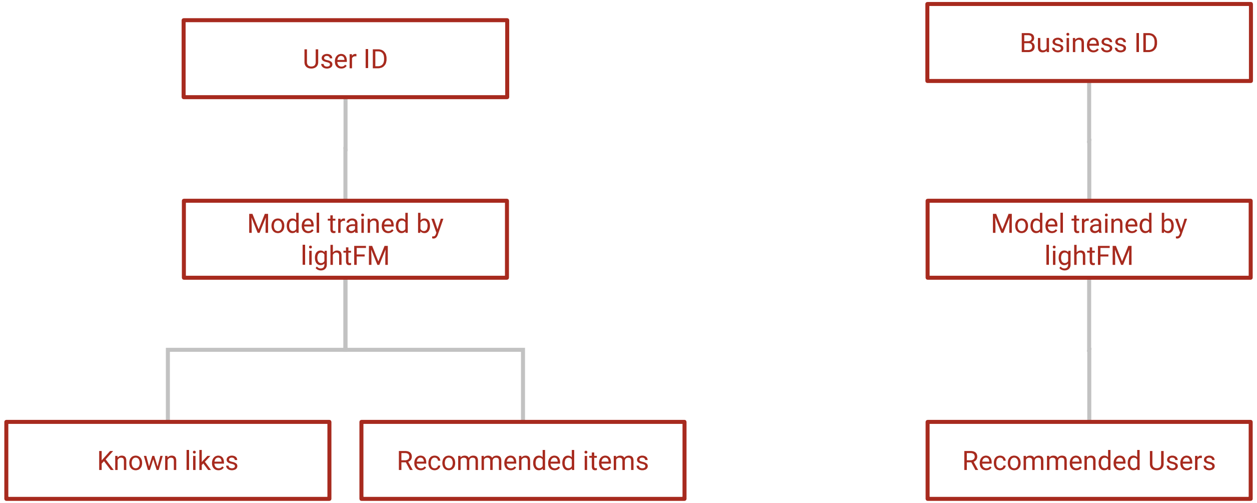
“I’d like to know who like my food most.”

“(optional) I’d like to know what features of my business will attract clients most.”

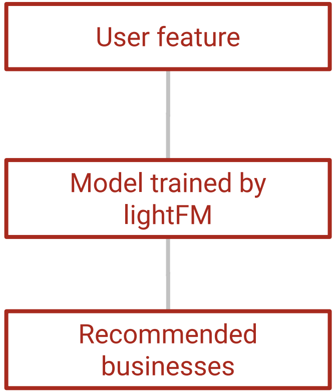
Project Directory Specification

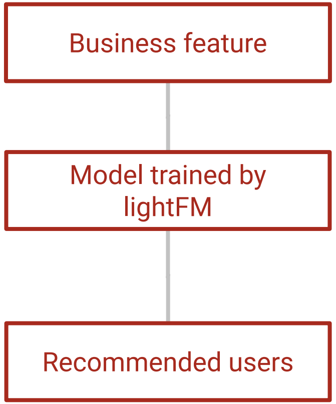
```
yelpify/
├── LICENSE
├── README.md
├── codebase
│   ├── __init__.py
│   ├── codebase.py
│   ├── data
│   │   └── test.csv
│   ├── tests
│   │   ├── __init__.py
│   │   ├── test_codebase.py
│   │   ├── test_data_pre.py
│   │   ├── test_model_cf.py
│   │   ├── test_model_hybrid.py
│   │   ├── test_recommend_hybrid.py
│   │   └── test_recommend_known.py
│   └── version.py
├── doc
│   ├── Design_Functional.md
├── example
│   ├── recommendation_system_cf.py
│   └── recommendation_system_hybrid.py
├── requirements.txt
├── setup.py
└── yelpify
    ├── __init__.py
    ├── data_preparation.py
    ├── model_cf.py
    ├── model_hybrid.py
    ├── recommend_hybrid.py
    └── recommend_known.py
```

Component Specification: Recommendation for existing users/businesses

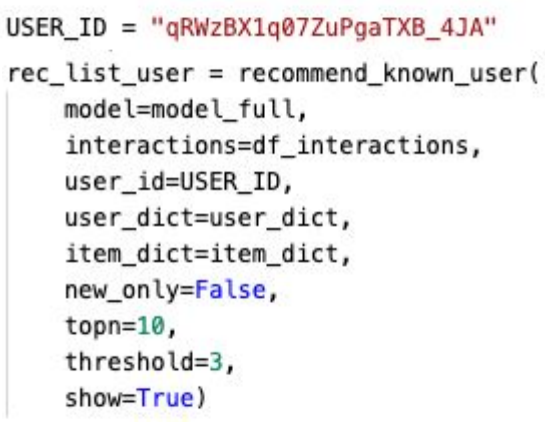


Component Specification: Recommendation for new users/businesses

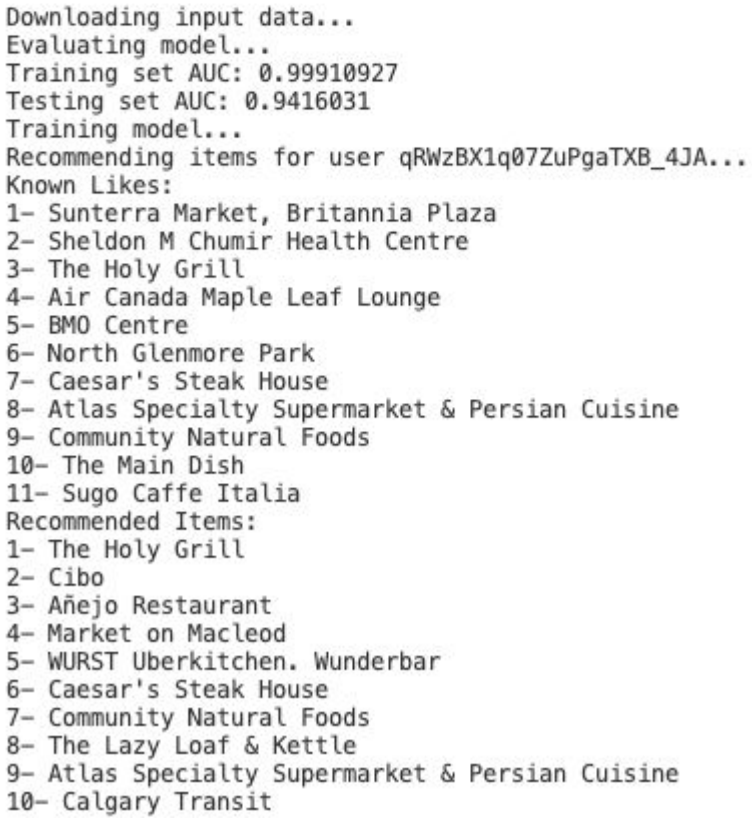




Code Example



```python
USER_ID = "qRWzBX1q07ZuPgaTXB_4JA"
rec_list_user = recommend_known_user(
    model=model_full,
    interactions=df_interactions,
    user_id=USER_ID,
    user_dict=user_dict,
    item_dict=item_dict,
    new_only=False,
    topn=10,
    threshold=3,
    show=True)
```



```
Downloading input data...
Evaluating model...
Training set AUC: 0.99910927
Testing set AUC: 0.9416031
Training model...
Recommending items for user qRWzBX1q07ZuPgaTXB_4JA...
Known Likes:
1- Sunterra Market, Britannia Plaza
2- Sheldon M Chumir Health Centre
3- The Holy Grill
4- Air Canada Maple Leaf Lounge
5- BMO Centre
6- North Glenmore Park
7- Caesar's Steak House
8- Atlas Specialty Supermarket & Persian Cuisine
9- Community Natural Foods
10- The Main Dish
11- Sugo Caffe Italia
Recommended Items:
1- The Holy Grill
2- Cibo
3- Añejo Restaurant
4- Market on Macleod
5- WURST Uberkitchen. Wunderbar
6- Caesar's Steak House
7- Community Natural Foods
8- The Lazy Loaf & Kettle
9- Atlas Specialty Supermarket & Persian Cuisine
10- Calgary Transit
```

Unit Tests

Data preparation

Collaborative filtering

Hybrid filtering

Lesson learned and Improvement

Setup Travis CI early

Optimize runtime of hybrid model on Travis using a small subsample

Repo reorganization

More elaborated README

Style improvement

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Team members' scope of work

June Yang: package selection (surprise, lightFM), recommendation using collaborative filtering, examples, demo, software design, technical review presentation

Quoc Dung Cao: package selection (manually built recommender system), final presentation, setup, license

Runqiu Hu: package selection (scikit learn), unit test, readme, software design, project preview presentation

Zichen Liu: built recommendation system using hybrid filtering, examples, demo, readme