Price My Rental

Apartment Price Recommendation Engine

Get Started

Price My Rental recommends accurate prices for San Francisco rental listings

Taken from actual craigslist listing on 6/15/15

Fill out the form to get a recommendation:

 # Bedrooms:
2

 # Bathrooms:
2

Address (SF only):
17 wood st

Zip:
94118

Neighborhood:
laurel hts / presidio

Parking:
Off-street Parking (e.g, shared garage)

Current/Intended listed price (for comparison):
3950 ← Listed price on craigslist

Description:

San Francisco - Jordan Park/Laurel Heights - Flat for rent Open House 6/14 Sun 1pm! Spacious apt. private deck, views, prkg Link to mobile layout: &nbsp; http://www.jwavro.com/rental_details.php?id=3309371-0 Summary: Rent: $3950 Bed / Bath: 2 / 2 Type: Flat Term: 1 Year Please contact: Joanne Fazzino &nbsp; | &nbsp; &nbsp; | &nbsp; &nbsp; &nbsp; | &nbsp; www.jwavro.com Description: OPEN HOUSE SUNDAY, JUNE 14TH AT 1PM SHARP (Please be prompt. Agent will leave after 15 minutes. If other times are needed, please contact agent.) 17 Wood #301 Please bring $30 fee per applicant and email completed applications (http://www.jwavro.com/JWA_Application.pdf) per person and proof of income (new offer letter or 2 most recent pay stubs) to Remodeled 2BR/2BA flat facing west with panoramic City and Ocean Views!&nbsp; You will love the wood burning fireplace, large private deck, and beautiful brand new hardwood floors. The dining area has wood floors as well.&nbsp; The spacious kitchen has a stove, refrigerator, disposal and dishwasher, lots of counter and cupboard space. You can see the Ocean and the western part of the City from your living room, dining room and one of the bedrooms. A wet bar and good closet space are 2 more of the great amenities of this flat. The bathrooms have been remodeled. Storage is included in the rent. Parking is allowed in the garage for 1 working vehicle. 6 unit bldg in cul de sac. Very Quiet Street. Great Unit!&nbsp; Walk to Laurel Village - 2 blocks away for great restaurants, coffee (Peets and Starbucks) and grocery shopping. No smoking and no pets. Pictures are of a similar unit in the building.&nbsp;Available around June 15, 2015.&nbsp; Details: Floors: Hardwood Kitchen: Modern - AEK Laundry: In Building Outside area: Deck Parking: Yes Parking Fee: $0 Pets: No View: City & Ocean Location: Wood Street & Geary Boulevard, San Francisco, CA J.Wavro is a No Fee Broker Find all J.Wavro listings on Craigslist: List View &nbsp; - &nbsp; http://sfbay.craigslist.org/search/hhh?zoomToPosting=&query=01810008 Map View - &nbsp; http://sfbay.craigslist.org/search/apa?useMap=1&zoomToPosting=&query=01810008 Meet the J.Wavro Team: http://www.jwavro.com/us.php Please contact: Joanne Fazzino &nbsp; | &nbsp; &nbsp; | &nbsp; &nbsp; &nbsp; | &nbsp; www.jwavro.com Preview more properties at www.jwavro.com Content and Images &copy; 2014 J.Wavro &nbsp; | &nbsp; BRE # 01810008 &nbsp; | &nbsp; cl390419209961-0

Submit

Web app - PriceMyRental.io

Your model-recommended price is: $3782

Your initial stated price was: $3950

About:

Price My Rental predicts prices for rental listings in San Francisco. For landlords, the app can recommend a fair monthly price for your property. For tenants, it can help determine if you're overpaying or getting a good deal.

For more information on how it works, please visit the GitHub repo

✉ Contact Me

Source on Github

Web app - PriceMyRental.io

What is a rental worth?

- San Francisco has one of the hottest rental markets in the US, and a ton of variation
- I looked at 9 months of SF craigslist housing rental data, and built a model that accurately predicts market prices for units

Techniques

- KD-Trees: Finding nearest-neighbors price medians
  - Space-partitioning model that splits data on medians, allowing the user to efficiently find approximate nearest neighbors
  -
- TF-IDF + NMF: Discovering latent features in listing descriptions
  - TF-IDF: Numerical statistic representing how important a word is to a document within a larger corpus
  - NMF: Factorizing the TF-IDF matrix into component matrices, one of which represents how highly each listing description ranks on each latent feature we're looking to uncover (in our case, 4 features)

Techniques
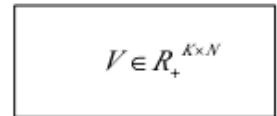

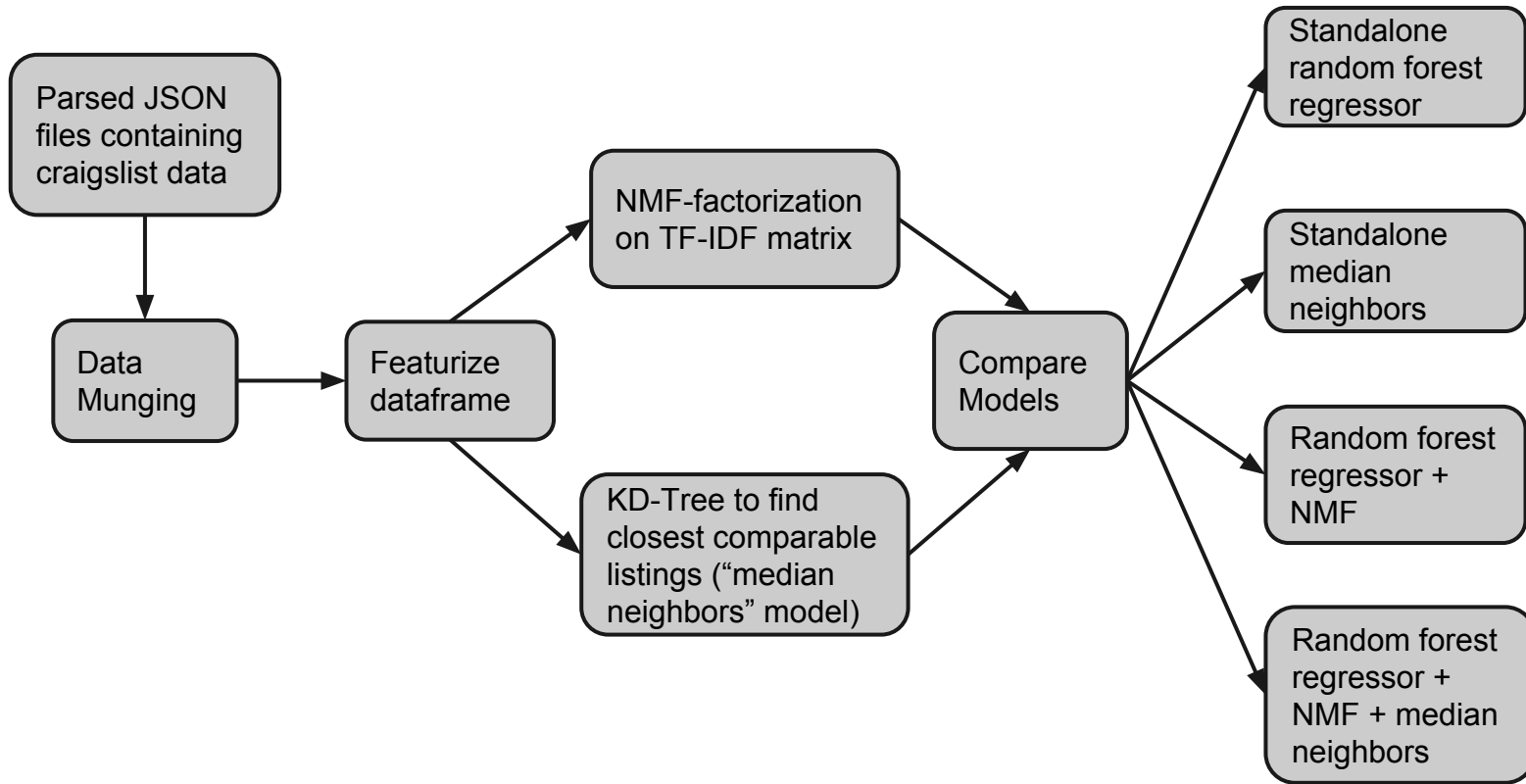## kD-Trees
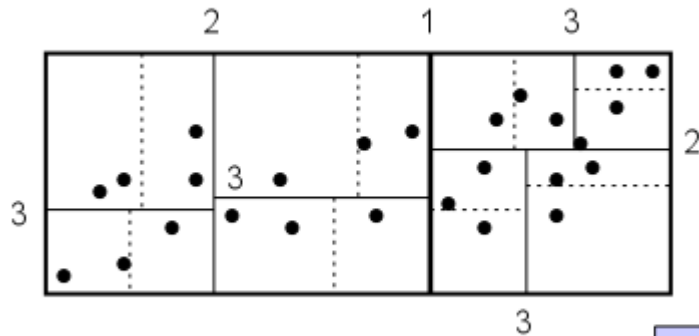
Split longer dimension near data media

NMF

$X \in R^{M \times N}$

Too sparse!

term-doc matrix

$=$

$U \in R_{+}^{M \times K}$

$\times$

$V \in R_{+}^{K \times N}$
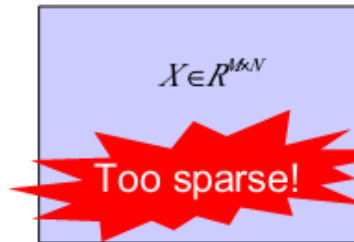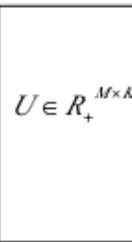
term-topic matrix

topic-doc matrix

Data Pipeline + Model Comparison

```
Parsed JSON
files containing
craigslist data

Data
Munging

Featurize
dataframe

NMF-factorization
on TF-IDF matrix

KD-Tree to find
closest comparable
listings ("median
neighbors" model)

Compare
Models

Standalone
random forest
regressor                  R^2: 0.730

Standalone
median
neighbors                  R^2: 0.784

Random forest
regressor +
NMF                        R^2: 0.807

Random forest
regressor +
NMF + median
neighbors                  R^2: 0.856
    *winner*
```
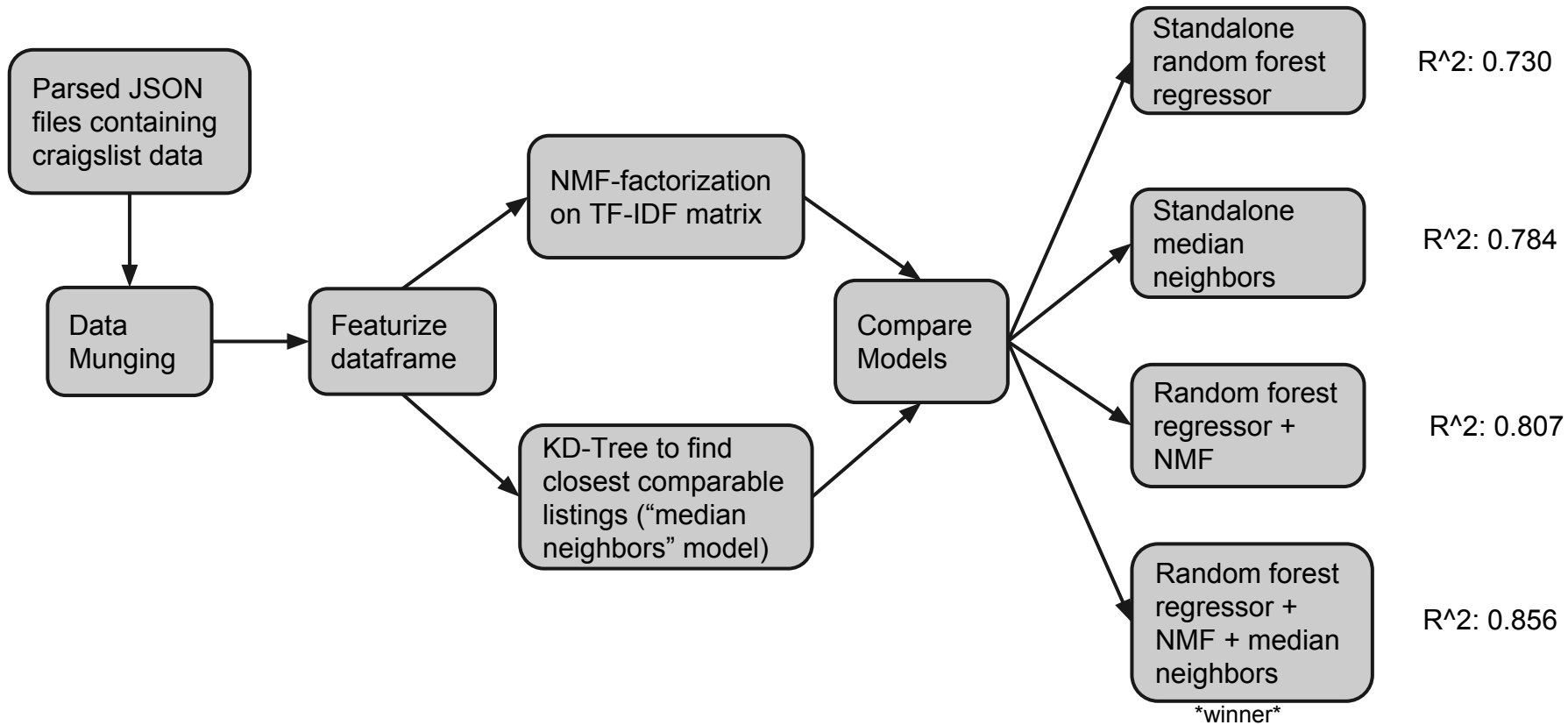
Data Pipeline + Model Comparison

Future Work

- Build functionality for more cities
- More rigorously test performance of different regression models
- Fix occasional discontinuities in model predictions (e.g., price decreasing when bedrooms increased for a given listing, holding all else equal)
- Add flexibility to prevent failure with edge cases (e.g., listing with 5 beds and 1 bath)

Libraries Used

- Scikit-Learn
- Pandas
- Numpy
- NLTK
- Geopy
- Flask
- Datetime
- urllib2
- cPickle