Buy vs Rent Proposal

235. Team Tufte Love

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What's the objective and who cares?

Objective:

To provide an intuitive “look-ahead” tool which helps users choose the most financially optimum option between buying or renting a home.

Who Cares:

People considering relocation or home purchase, who want to make a smart decision based on both their current personal financial situation as well as predictive analysis on the real-estate property.

Existing practice, limitations, and how we bridge them

Why will it be successful, and expected innovation

- We do the heavy-lifting around real-estate market data research to general value estimates, **not** our users
- We utilize extensive publicly available 20 years worth of data
- Our innovation focuses around machine learning estimation for key parameters
    - **Location-dependant** sales price
    - Rental price
    - Equity appreciation rate

Features	Zillow	Realtor.com	Our Tool
Rent Price	✅	✅	✅
Purchase Price	✅	✅	✅
# beds	✅	✅	✅
Type of Home	✅	✅	✅
Home Type	✅	✅	✅
Sqft Size	✅	✅	✅
Location/ZipCode	✅	✅	✅
Buy vs. Rent	❌	✅	✅
Simplifed Financial Knowledge	❌	❌	✅

Our tool will be successful because its removes the burden of financial analysis from the average consumers and prevents them from making a poor expensive decision just because their layman assumptions were incorrect

Defining Success

- **(Front End) Interpretability :**
  - Intuitively utilize our tool with minimal explanation.
  - Visualizations generated will be well-labeled and easy to understand.
  - Minimal input from user in areas where they don't have expertise
  - *Defining Success: cohort feedback deterministically favorable in the 3 areas above.*

- **(Back End) Benchmarking Outputs against a Baseline:**
  - Our Rent vs. Buy recommendations will be compared against existing services.
  - *Defining Success:* on-par with competing products or better (within a certain standard deviation)

Future: Measuring Success & Impact

Should we develop this service further and deploy as a full service, we would conduct the following to measure impact

- **A/B Testing :**
  - **Group A:** The group that is not exposed to our service that is in considering a rent v. buy decision
  - **Group B:** The group that is exposed to our service
  - **Metrics:**
    - Conversion (amount of time to reach decision)
    - Increased user count

- **Survey Questions**
  - Prior to and after product launch, send out surveys
    - Time taken to reach a decision to rent v. buy
    - Understand factors that influence decisions to rent v. buy

Risks, Payoffs, Cost & Duration

Risks

Nuanced county/municipal -level
- Tax regulation
- Real estate regulations
- Rental requirements

Payoffs

For consumers:
- save time,
- reduce stress and
- avoid analysis paralysis

by serving results from *generalizable back-end models*

Cost

$0

(via open source technologies and free PaaS capabilities)

Duration

6 weeks

Progress measured by internal milestones

Weeks ending	Phase
March 6th	Exploration / Mock setup
March 13th	Cleaning / Design
March 20th	Development
March 27th	Integration
April 3rd	Testing / Documentation
April 10th	Testing / Documentation
April 17th	Testing / Documentation

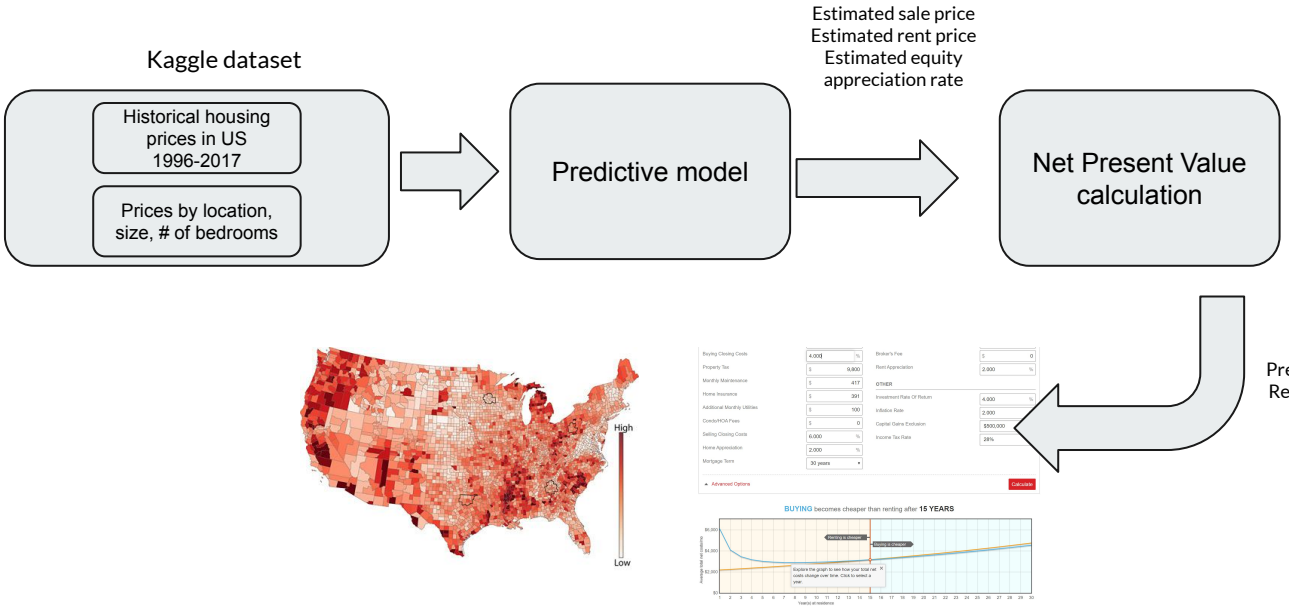
(more details in plan of activities)

Plan of Activities

Weeks ending	Phase	Back End	Front End	Deliverables
March 6th	Exploration / Mock setup	Data Exploration	Mock API Setup	Internal team demos
March 13th	Cleaning / Design	Data Cleaning & Transformation	Front-end Design framework for visualizations & interactivity	Internal team demos
March 20th	Development	Deliver data payload in final format	Build visualizations	Internal team demos
March 27th	Integration	Test front end	Data ingestion for front end	**Progress Report Due (3/27-Fri)**
April 3rd	Testing / Documentation	Testing	Testing	Write-up
April 10th	Testing / Documentation	Testing / Write Up	Testing	Write Up
April 17th	Testing / Documentation	Cleaning Up Code & Documentation	Testing	**Final Report Due (4/17-Fri)**

Appendix

Solution Architecture



Visualization interface

Application Architecture

End user

Interacts with

@app.route("/apiCall")
…(unpickle our model)
...
Returns html

html
Python
Django
D3 js

Python flask

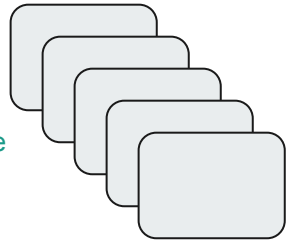
rentorbuy.herokuapp.com/apiCall

Builds & deploys to heroku

github.com

commit code

Team members



Python model trained persisted on disk (pickle), and committed.

Database (optional)

csv csv csv

Kaggle data set (2 GB) on laptop

Team Contact(s)

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