First Stop
For First-time
Home Buyers

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Background and the problem we are trying to solve

Homeowners in the expensive King County market are challenged to find a dream home they can afford. They also need to quantify monthly expenses. Our goals are:

- Build a high quality model to predict sales prices throughout King County
- Suggest a listing price for a home
- Offer a bidding range for a prospective home buyer
- Estimate monthly expenses of ownership to include mortgage, taxes, insurance, utilities and residential services

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Data for FirstStop

Data Source:

Our dataset contains elements of two sources, which we merged. These are:

- King County home price data for years 2014 and 2015
- Publicly available sales data from Zillow, the leading real estate and rental marketplace

Limitations:

The single largest limitation of the merged dataset is that it contains no data from the years 2016 or 2017. Accordingly, our model needed to project prices into the future using average increases for these years. Price appreciation in King County in the past two years has been significant.

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Use cases

- User wants to buy a home in a specific neighborhood with particular features, and she wants to know the price range for her requirements
- User has located homes of interest, and is interested in determining appropriate bidding prices
- User wishes to sell a home, and given the features of the home she wishes to calculate an appropriate list price
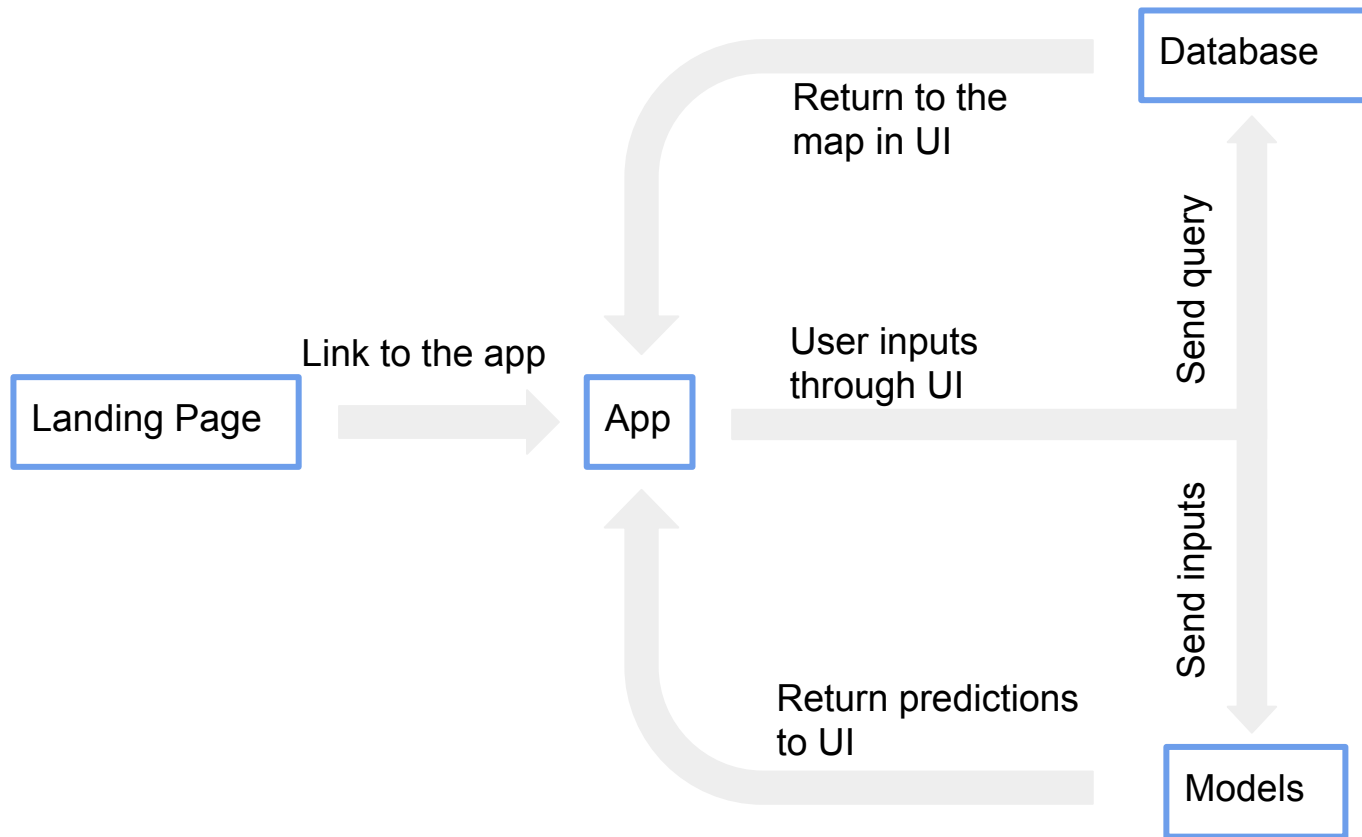- User has determined homes of interest, and is interested in estimating monthly expenses of ownership

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Demo

	Rachel AGE: 30 OCCUPATION: Software Engineer at a big tech company located in Seattle EDUCATION: Bachelor's degree
GOALS	First Time home buyer, looking for a moderate size single family house for her and her husband with possibilities of increasing family size in the following a few years.
TECH ABILITY	Somewhat tech savvy, heavy user and contributor to social media

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Components

➢ Machine Learning Model
  - For use case of predicting housing price
➢ Mathematical Models
  - For use case of predicting listing price and monthly expenses
➢ Database
  - Sqlite3
➢ Landing Page
  - Bootstrap template, hosted on Azure
➢ Bokeh App
  - Deployed to Bokeh server for an interactive app

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Interactions

Database

Return to the
map in UI

Send query

Link to the app

Landing Page → App

User inputs
through UI

Send inputs

Return predictions
to UI

Models

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Applying Learnings from Course to Project

- ❖ **Assess Needs:** Identifying a problem
- ❖ **Design Specification**: Defining use cases , components and interaction between the components.
- ❖ **Develop Software:** Good coding practice,Documentation style,Code Review
- ❖ **Test Software:** Unit tests
- ❖ **Version control:** Used Github exclusively for version control
- ❖ **Project structure on Github repo**: Inputs from Shablona and Projects tab of course webpage. Demo

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Future Features

➢ **Web hosting**: Deploy the Bokeh app on shared hosting using DigitalOcean

Name	IP Address
FirstStopForData515 512 MB / 20 GB Disk / NYC3 - Ubuntu 16.04.2 x64	174.138.62.120

➢ **Map accuracy:** Increase map accuracy by co-relating it to more features

➢ **Value addition for customer:** Finance options, Walk score, School ranking

➢ **Integration with other apps**: Integrate our app with third party apps like real estate agent listings and ratings

➢ **Provide more features to customer**: House types, last remodelled year etc

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Reflections...

Worked out well :-)

★ For document deliverables, created templates first and then each team member filled up the respective section.
★ With no knowledge of Bokeh, we created a working prototype in less than 3 weeks.
★ Handled the multiple bokeh endpoints with individual port mappings.

Could have done better :-/

★ DO not work on same files at the same time.
★ DO not attempt to make a web UI with Bokeh: The screen looked like stuck in stone age.

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