AirBnb – Home away from home

The Team

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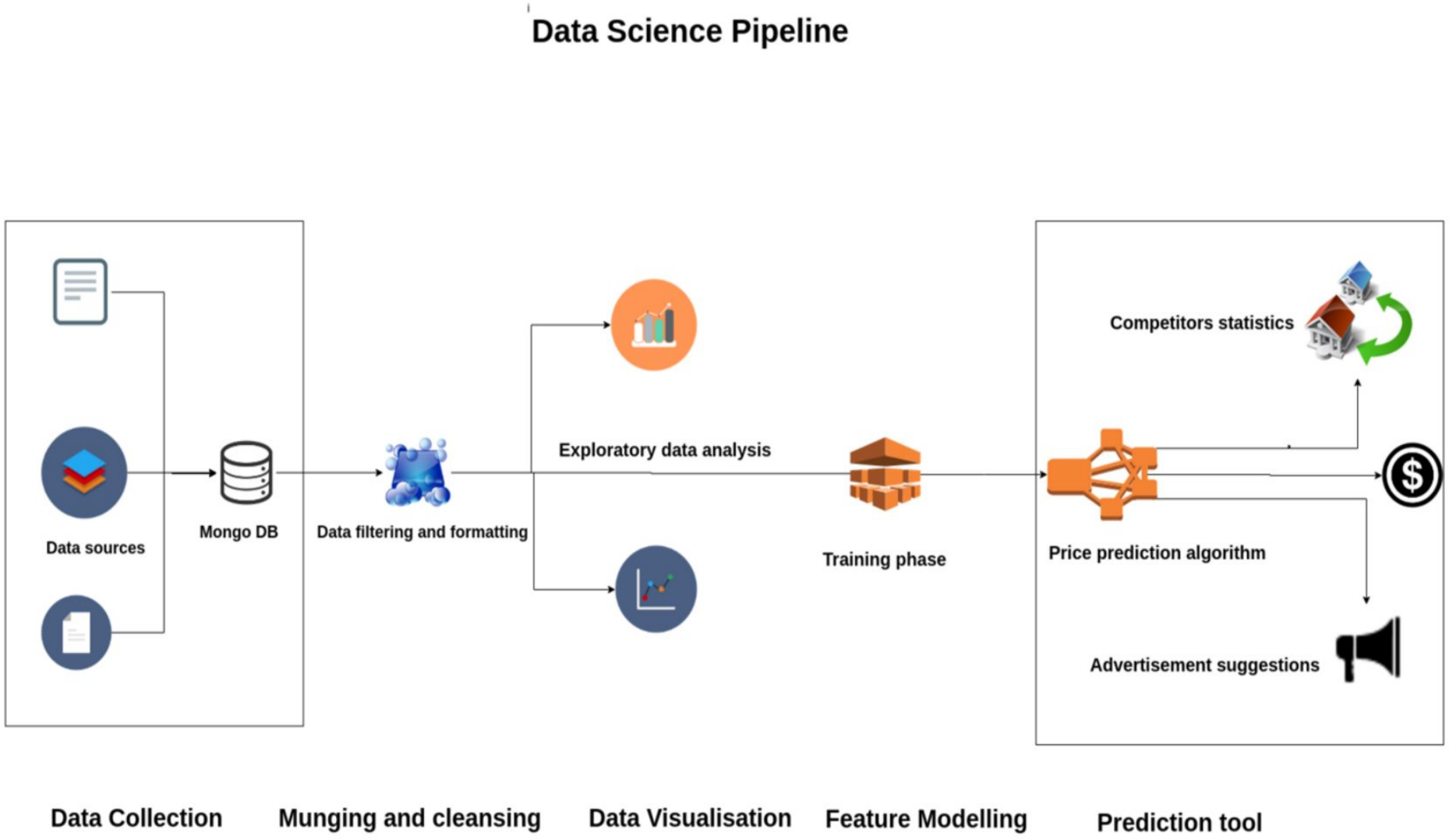
Problem Statement

What should be the price of an Airbnb listing given its features, popularity of its neighborhood and its competitors? How to advertise a listing to maximize its capacity?

Methodology



Data Collection and Munging

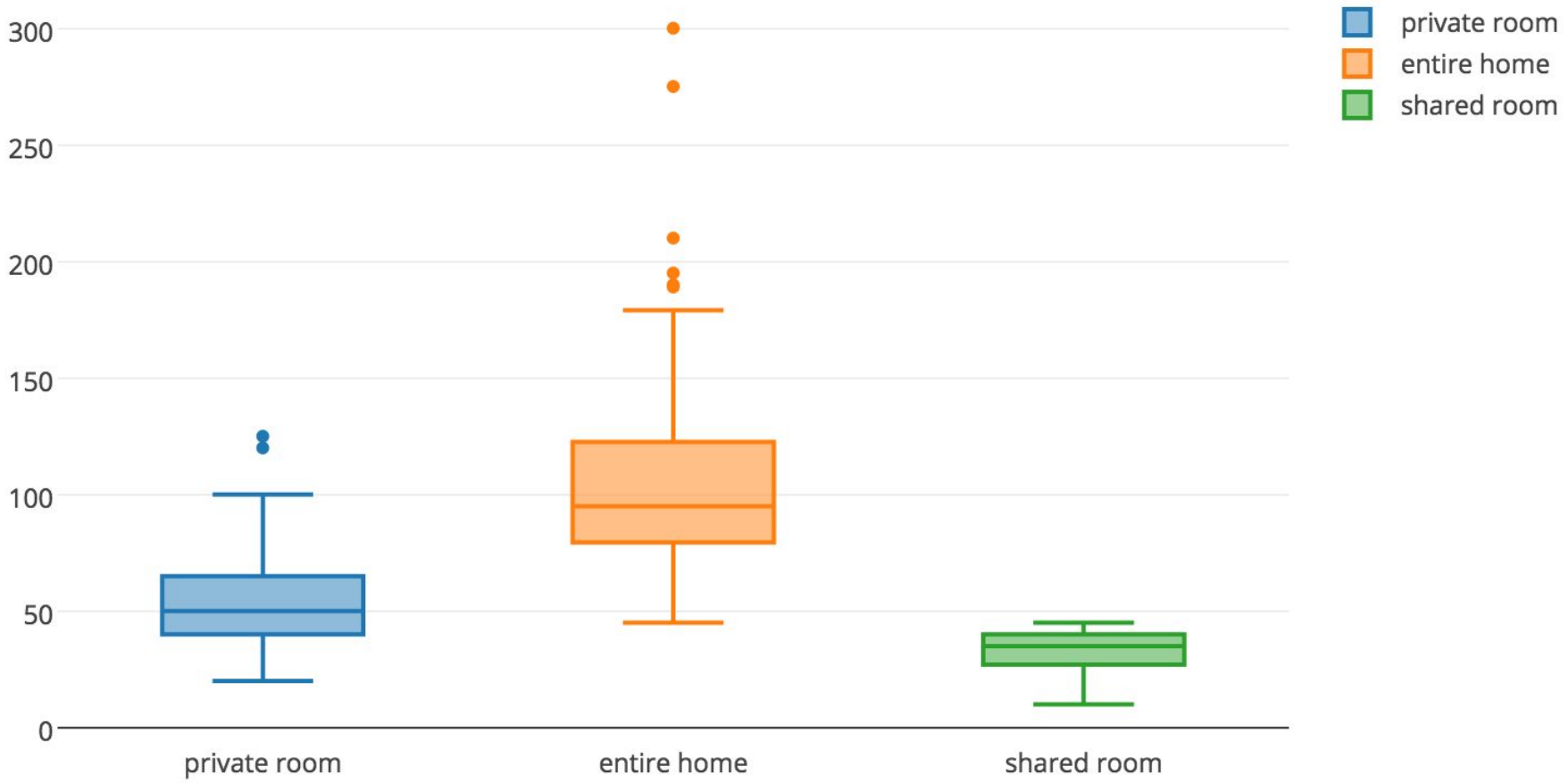
- Airbnb API
  - Listing Search (listing id, ratings, reviews and etc.)
  - View Listing Info (listing location, amenities and etc.)
  - View User Info (guest name, country and etc.)
- geocoder library

Exploratory Data Analysis

Price

How does price change over different room types?

Exploratory Data Analysis



Exploratory Data Analysis

Listing features

What is the distribution of amenities over all listings?

Exploratory Data Analysis

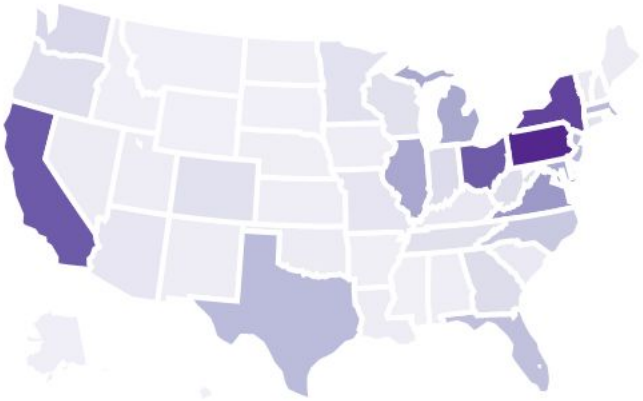
Exploratory Data Analysis

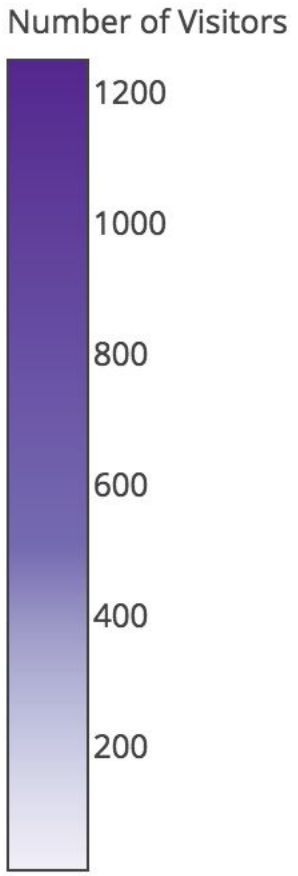
Guests

From which part of the world do people visit Pittsburgh?

Exploratory Data Analysis

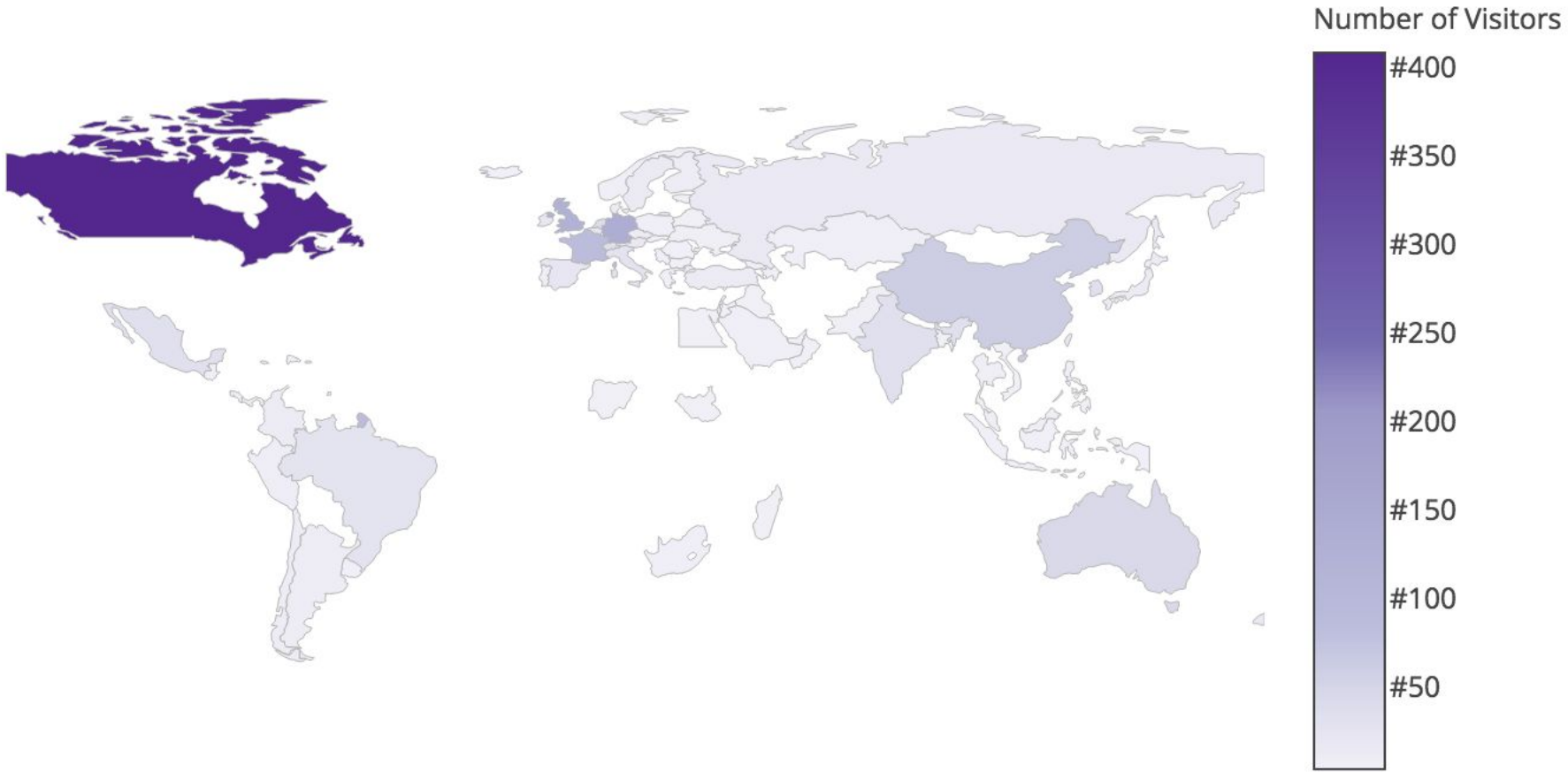
Geography of Airbnb guests in Pittsburgh (within US)



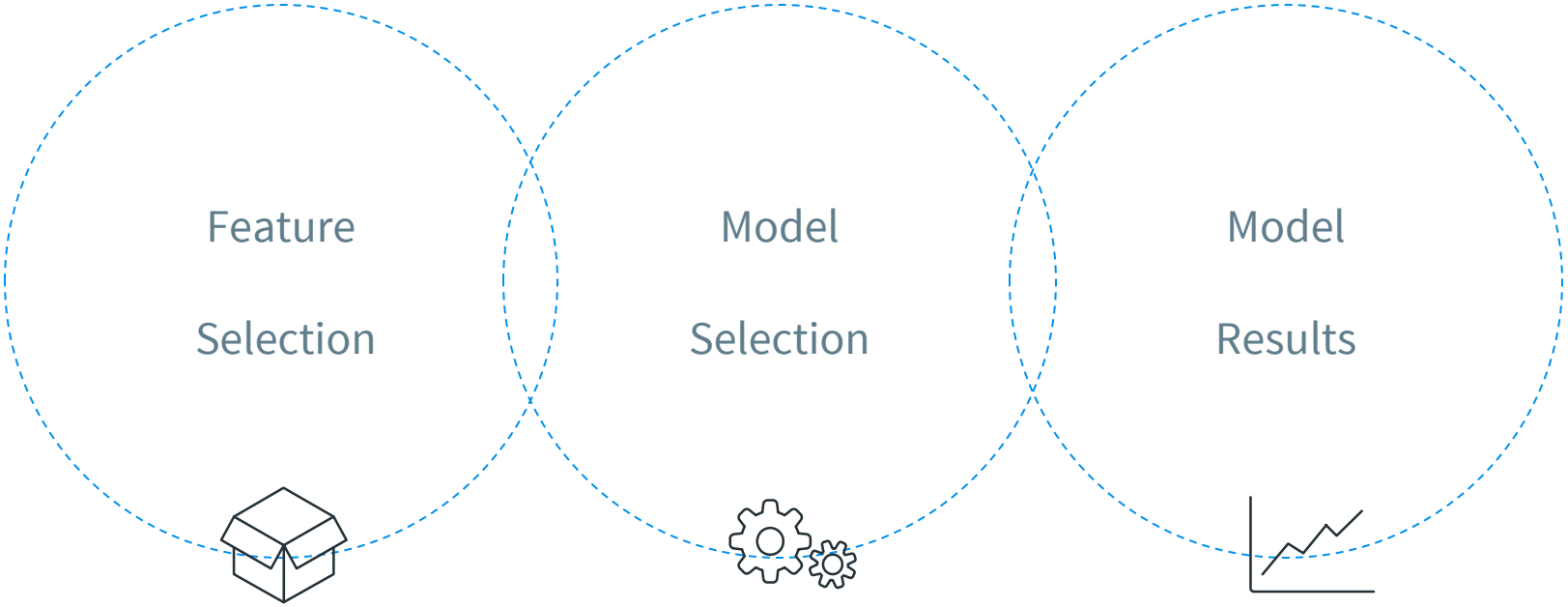


Exploratory Data Analysis

Geography of Airbnb guests in Pittsburgh



Price Prediction Model



Feature Selection

Listing features

- lat/lon, #of amenities, price, room type, bedrooms, bathrooms, beds, monthly discount, weekly discount

Connectivity & Popularity

- proximity to different places of interest
- WalkScore API

Zone matters

- Geo clustering

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Zone matters

- Geo clustering
- Add a geo clustering graph here?????

Model Selection (regression)

Linear Regression

- Basic (outliers removed)
- Lasso regularization

Linear Regression with AdaBoosting

- Compensate residuals with a number of linear regressions
- Parameters:

Gradient boosting regression

- Compensate residuals with some decision trees
- Parameters:

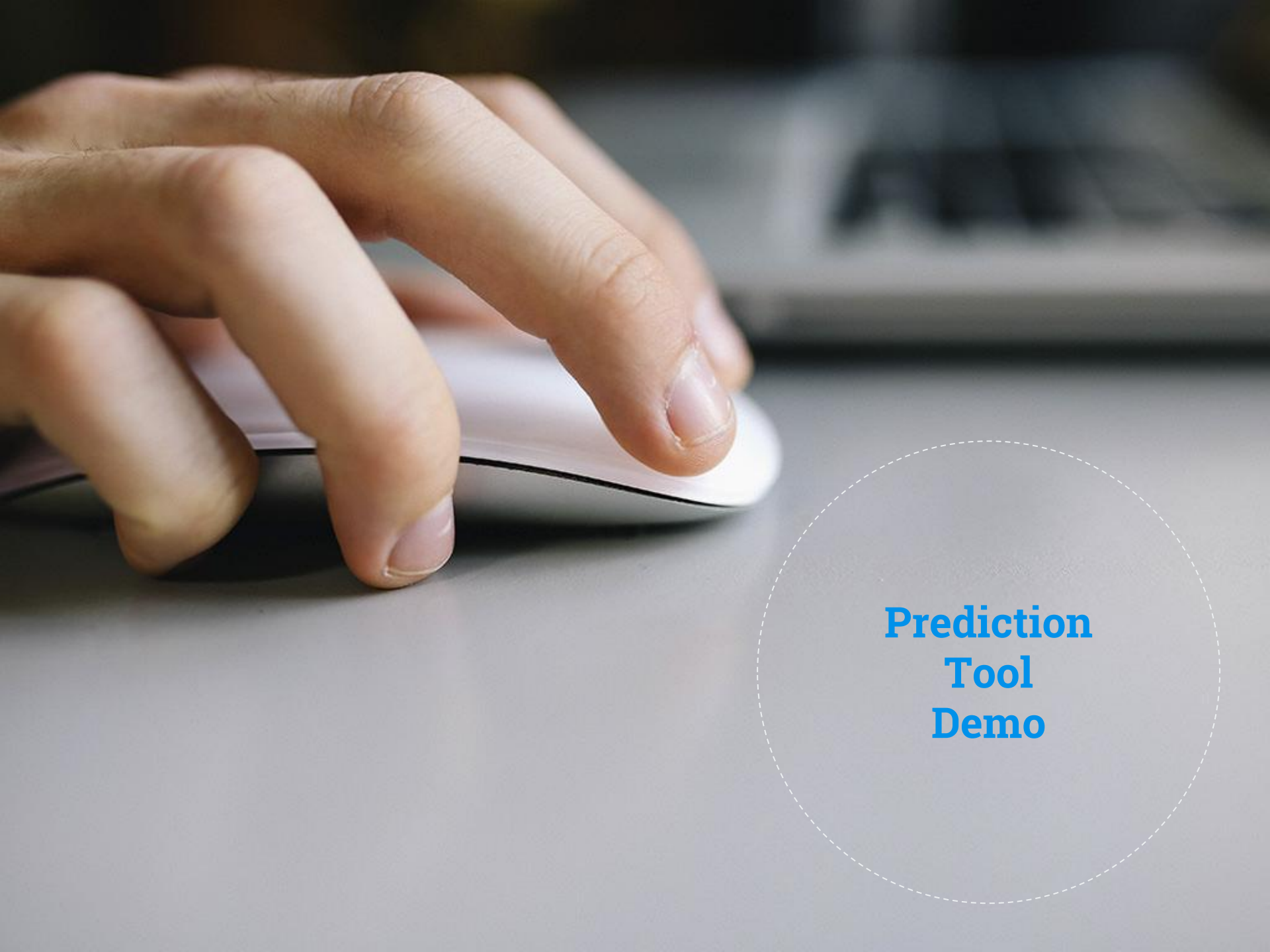
Model Result

	MSE	R2_Test	R2_Train
Model			
Linear Regression	911.597588	0.334339	0.540044
ADA Boost	543.376868	0.603219	0.720861
Gradient Boosting	766.389933	0.440371	0.984034

Linear Regression with AdaBoost stood out!

Reasons

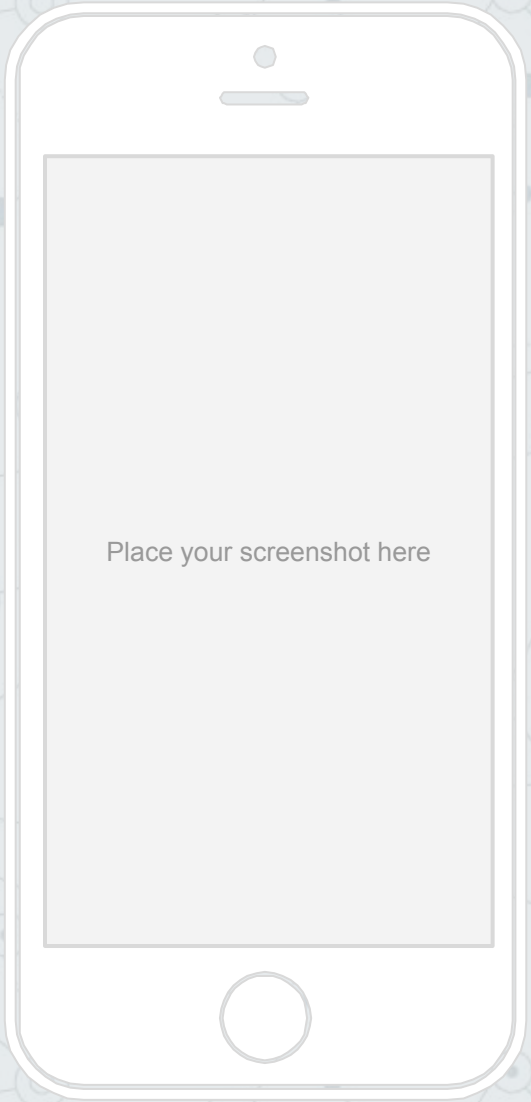
- Price is continuous variable. Using decision tree model to compensate residual is less accurate
- Max_depth is small.
- Scarcity of training data.
- Sacrifice the benefits of setting more tall trees to avoid overfitting



Prediction Tool Demo

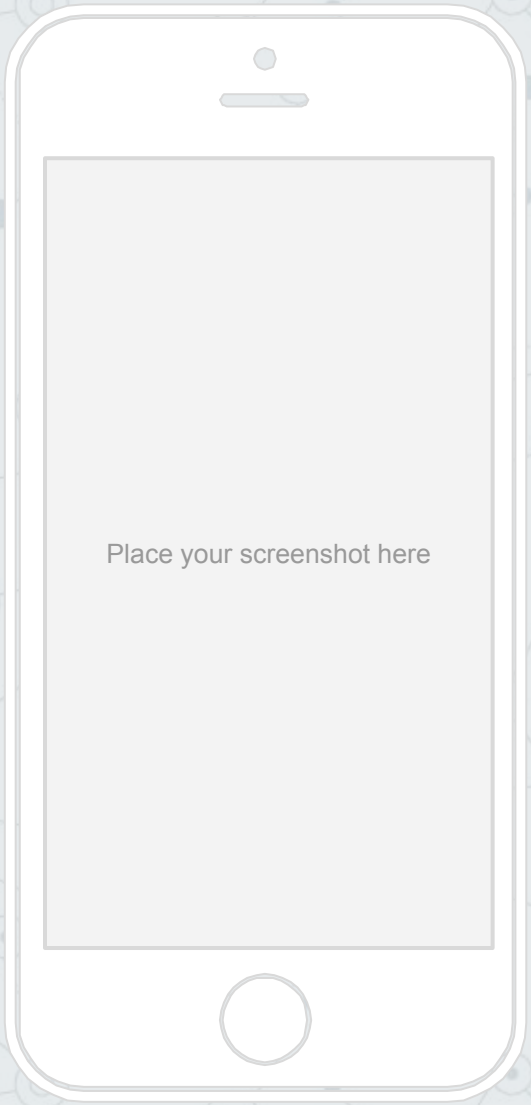
User Input

- ✓ Listing address
- ✓ Room type
- ✓ Amenities list
- ✓ Bedroom
- ✓ Bathroom
- ✓ Bed
- ✓ Discount



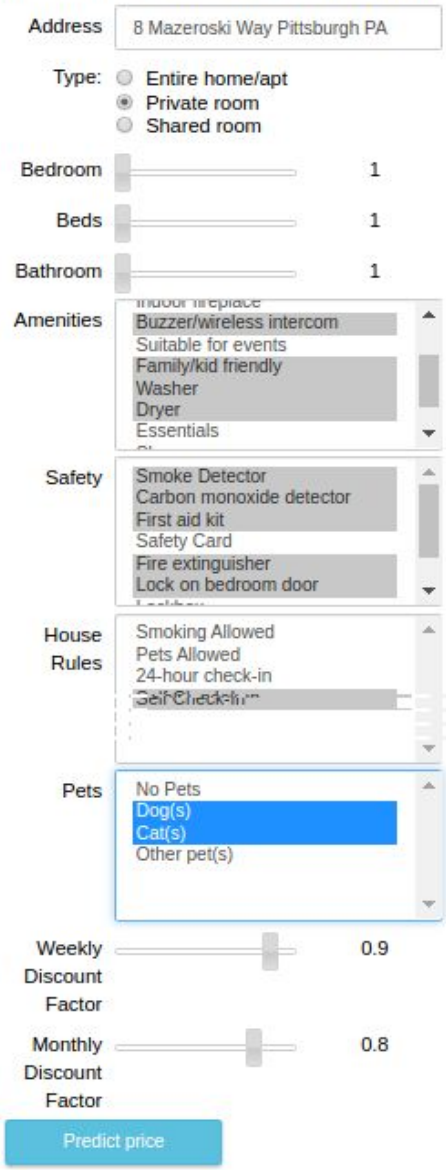
Prediction Tool Output

- ✓ Predicted Price
- ✓ Pricing stats of nearby Airbnb listings
- ✓ Places of Interest
- ✓ Advertising recommendations



Location: 8 Mazeroski Way Pittsburgh PA

In [40]:
```
#using ada boosting without outliers for our prediction tool
pred = price_prediction_tool(ada,ada_X,kmeans_ada,listings)
```

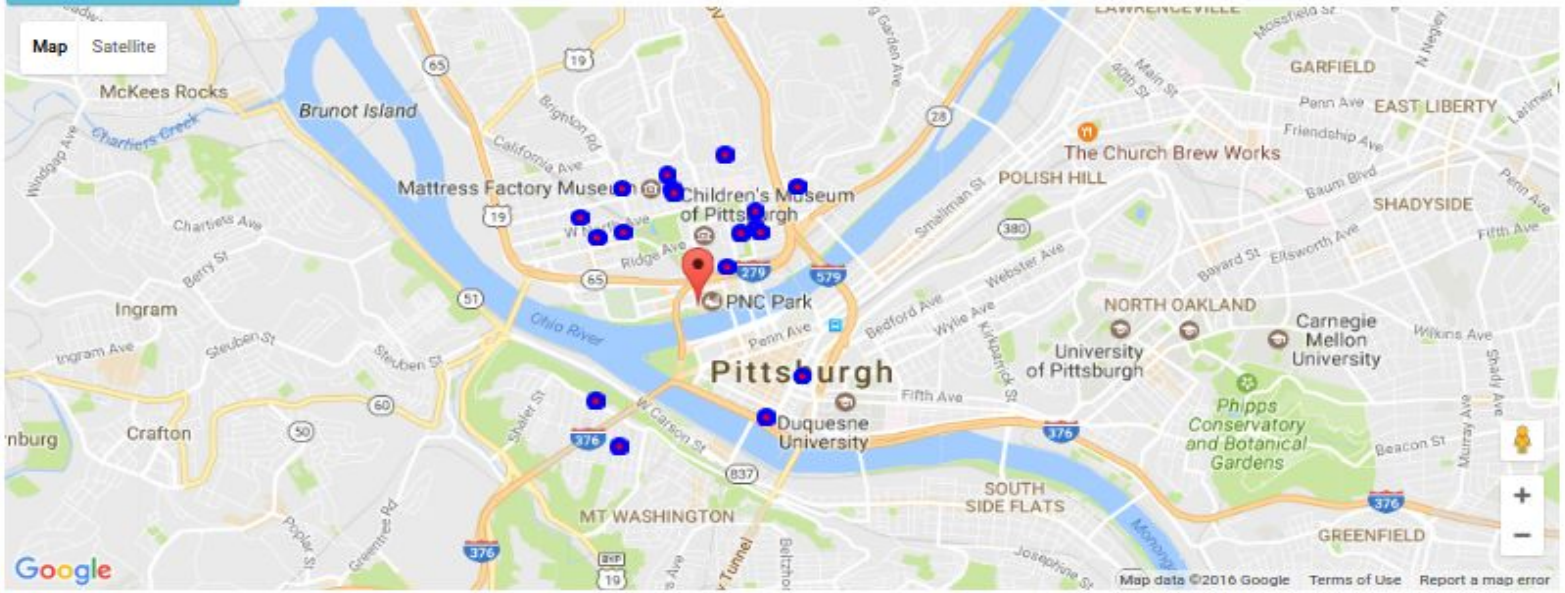


Location: 8 Mazeroski Way Pittsburgh PA

Weekly Discount Factor 0.9

Monthly Discount Factor 0.8

Predict price

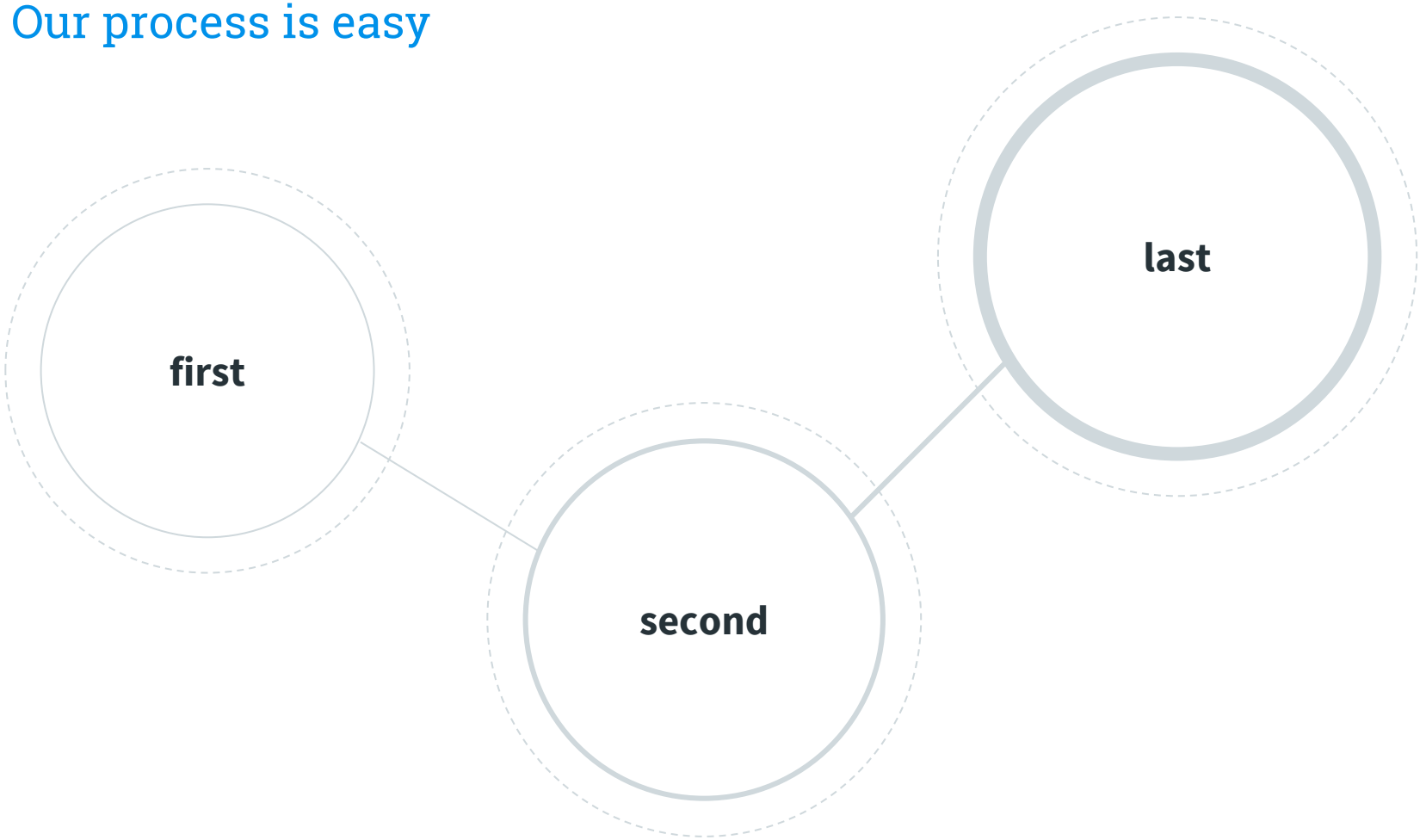



```
Predicted price for the listing: $73.91

~~~~~Similar listings nearby~~~~~
Minimum Price: 29.0
Maximum Price: 100.0
Average Price: 57.47

~~~~~Places of Interest~~~~~
Active Life:
        North Shore Riverfront Park
Restaurants:
        Hyde Park Prime Steakhouse, Slice On Broadway, Lexus Club at PNC Park, Gio's Cafe, Clark Bar & Grill
Entertainment:
        PNC Park, Beerhead Bar, Lexus Club at PNC Park, Clark Bar & Grill
```

89,526,124

Whoa! That’s a big number, aren’t you proud?

Our process is easy



Let’s review some concepts

Yellow

Is the color of gold, butter and ripe lemons. In the spectrum of visible light, yellow is found between green and orange.

Blue

Is the colour of the clear sky and the deep sea. It is located between violet and green on the optical spectrum.

Red

Is the color of blood, and because of this it has historically been associated with sacrifice, danger and courage.

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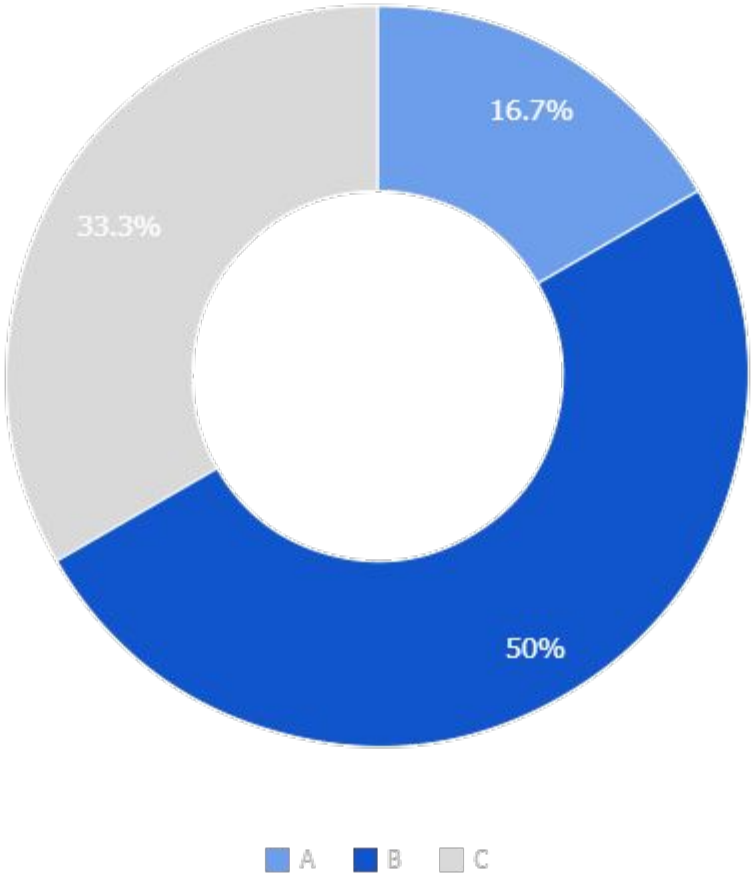
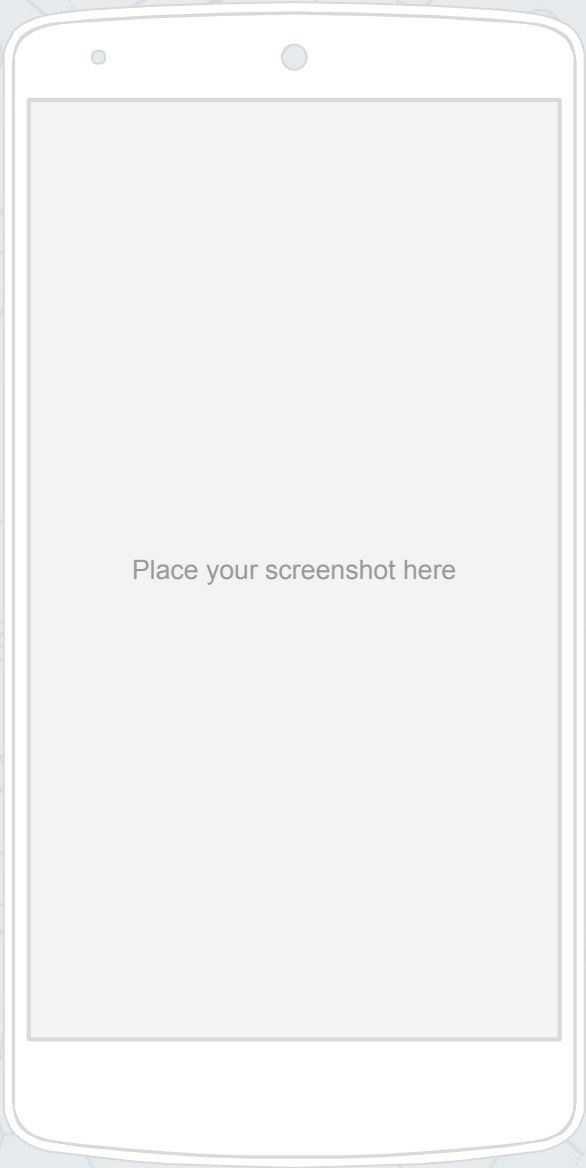


You can copy&paste graphs from Google Sheets

Android project

Show and explain your web, app or software projects using these gadget templates.



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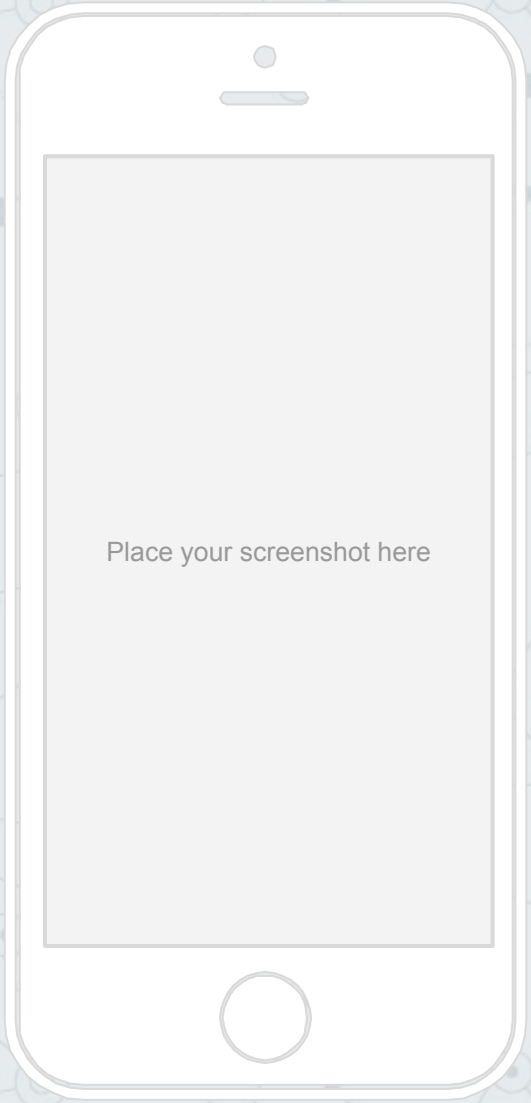

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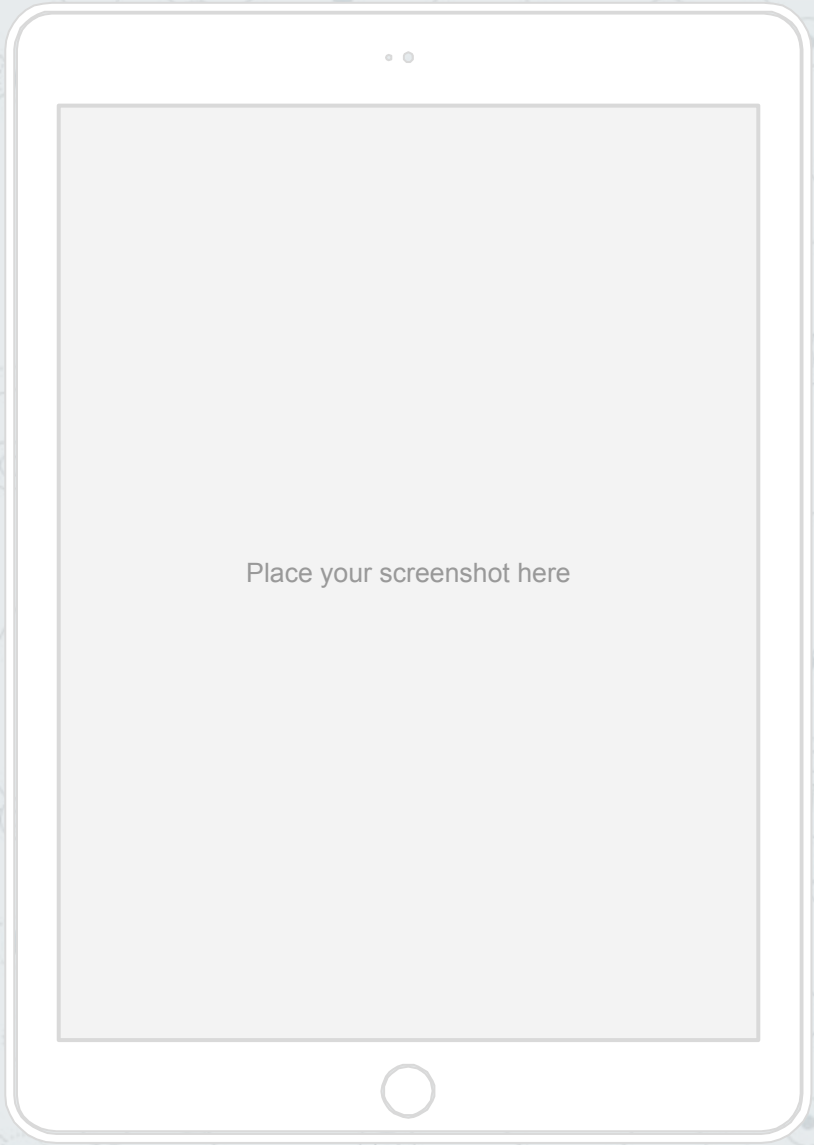

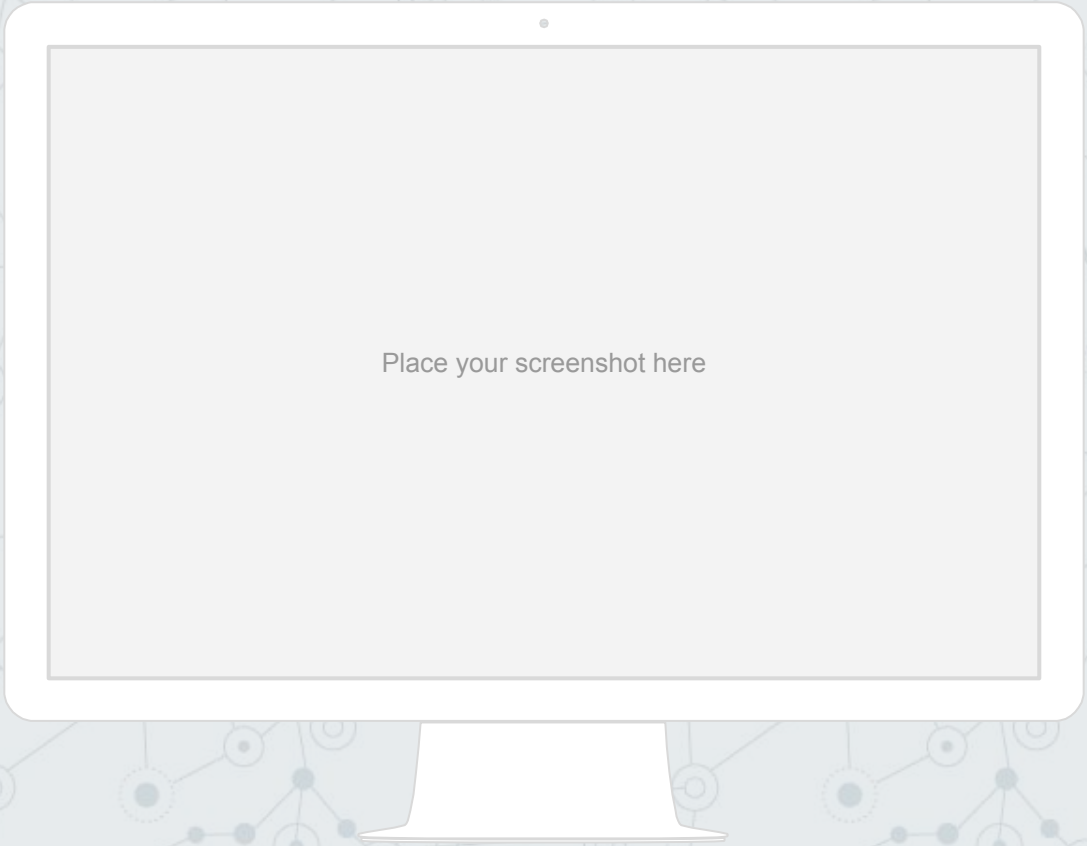

Desktop project

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Thanks!

Any questions?

You can find me at:
@username
user@mail.me

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- Blue **#0091ea**
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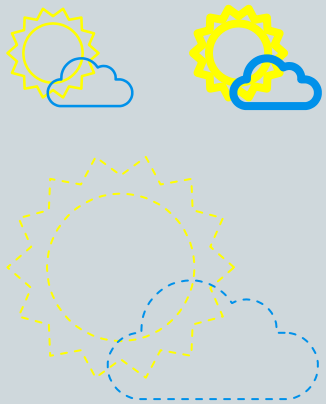
Isn’t that nice? :)

Examples:



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How? Follow Google instructions
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