

AI - Neural Networks Project Summary

- **Context:** This presentation was the capstone project for a Neural Networks course taken through [Modal.io](#), a corporate training platform.
- **Purpose:** Create a “product” using AI and a dataset that was provided.
- **Prediction:** The sale price of a home + the time-to-sell.
- **Notice:** How the benefits of the model are translated into business value for a realtor or potential customer.
- **Notice:** How the results of the model are turned into an *optimization problem*, maximizing a realtor’s total income.
- **Technical architecture:** neural network via backpropagation
 - Price: 3 layers (2 hidden, 1 output). 29 features, linear activation
 - Time-to-sell: 3 layers (2 hidden, 1 output). 36 features.
 - Hidden layers have sigmoid activation;
 - The output layer uses linear activation

AI-PRAISE

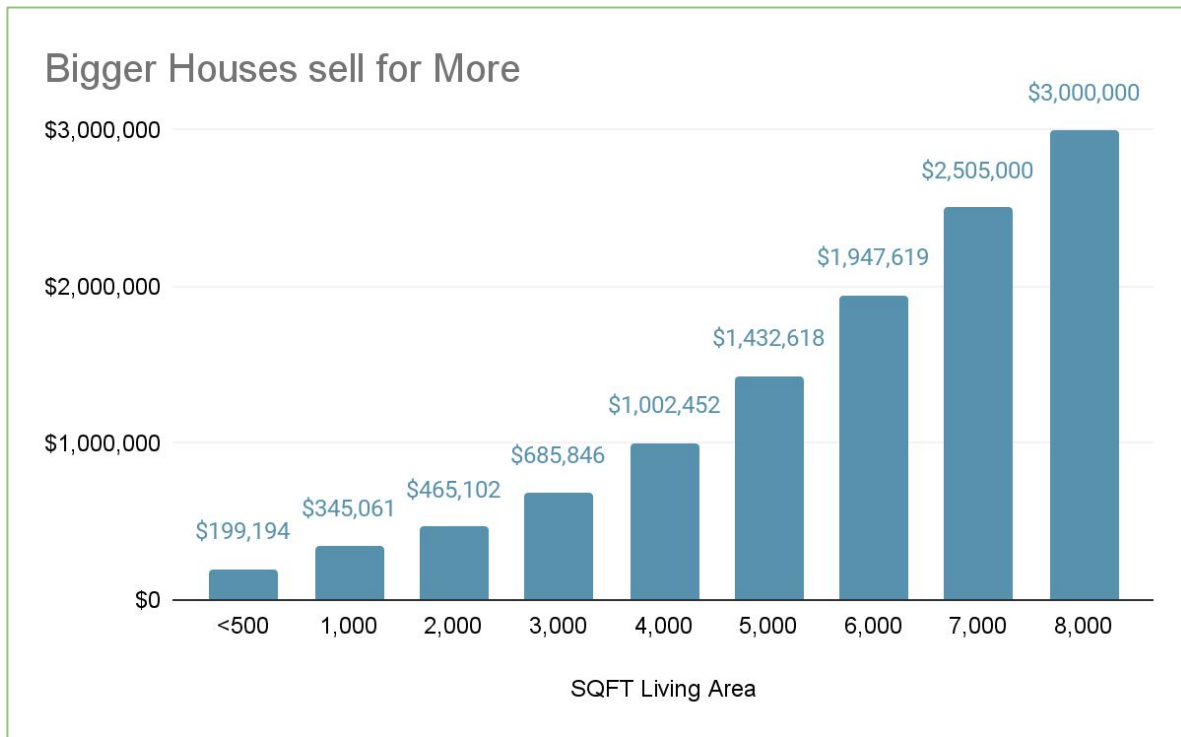
AI-Powered
Real Estate
Appraisal Services



1. PRICE YOUR LISTING ACCURATELY
2. MANAGE CLIENT EXPECTATIONS
3. MAXIMIZE YOUR EARNINGS!



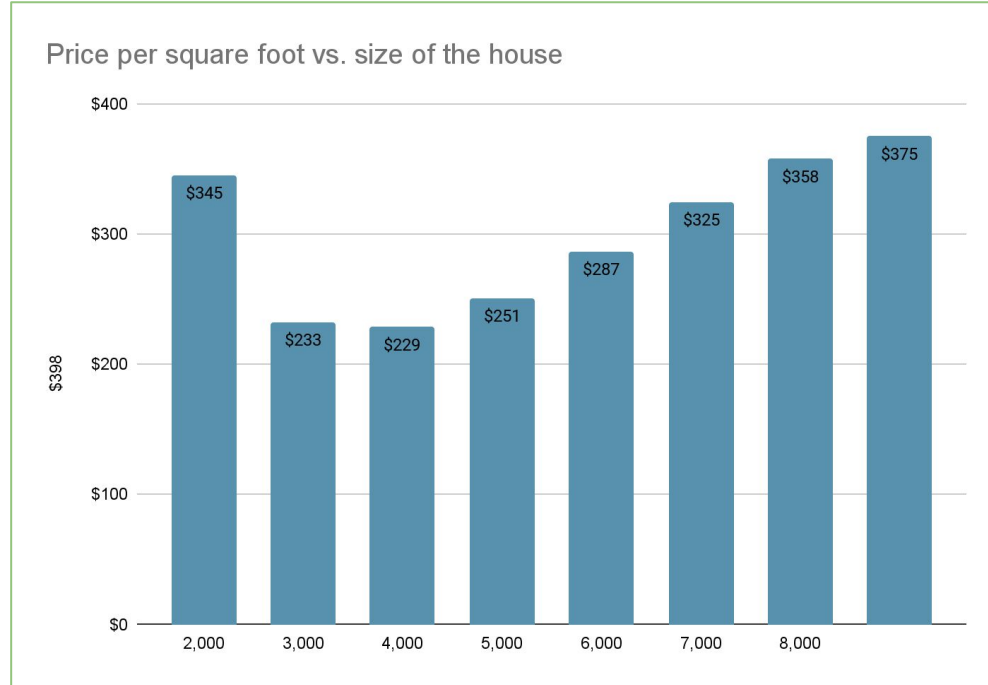
We all know Bigger Houses sell for more...



SQFT Living	Price
<500	\$199,194
1,000	\$345,061
2,000	\$465,102
3,000	\$685,846
4,000	\$1,002,452
5,000	\$1,432,618
6,000	\$1,947,619
7,000	\$2,505,000
8,000	\$3,000,000

... but **SMALLER** and **BIGGER** houses are more valuable

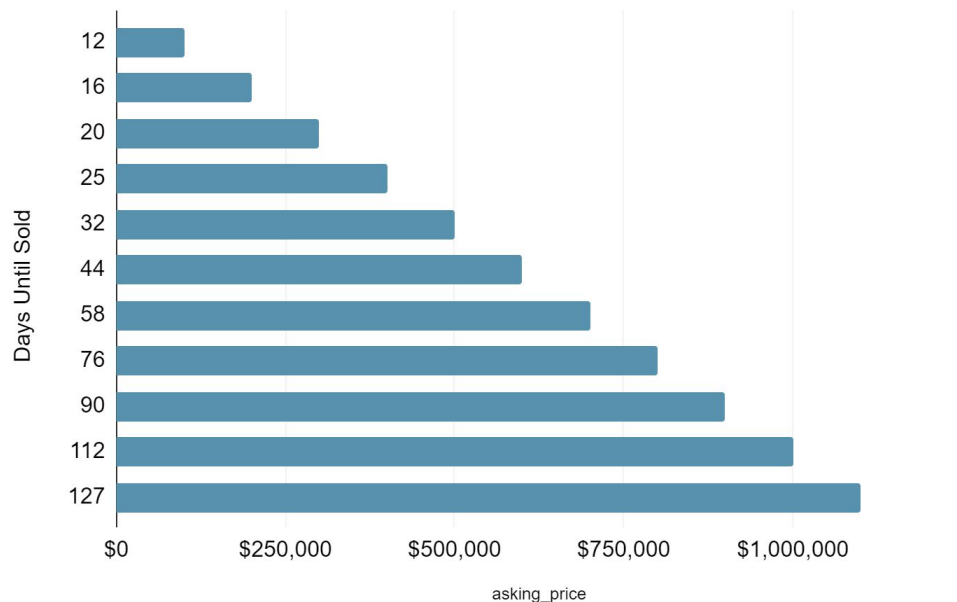
Not all Square Footage is Created Equal!



SQFT Living	Price/SQFT
<500	\$398
1,000	\$345
2,000	\$233
3,000	\$229
4,000	\$251
5,000	\$287
6,000	\$325
7,000	\$358
8,000	\$375

More Expensive Houses take longer to sell...

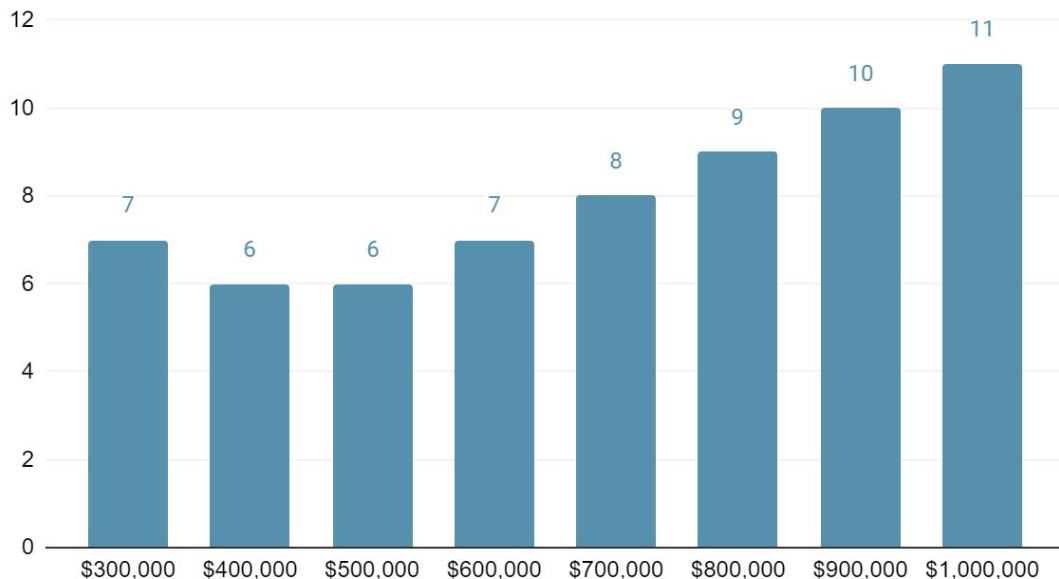
How Long Does it take to sell a house?



Asking Price	Avg. Days to Sell
\$100,000	12
\$200,000	16
\$300,000	20
\$400,000	25
\$500,000	32
\$600,000	44
\$700,000	58
\$800,000	76
\$900,000	90
\$1,000,000	112

... but It takes “disproportionately longer” to sell Big Houses!

Days per \$100,000 of List Price



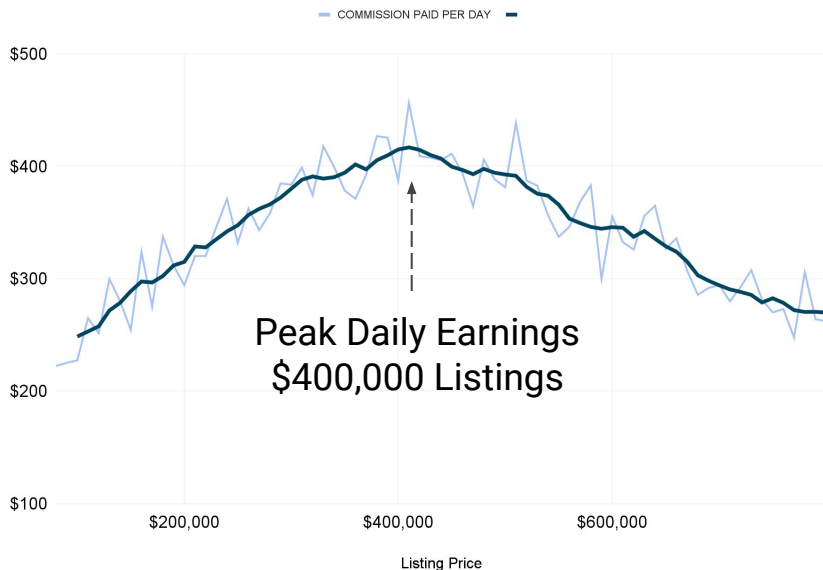
Price	Days <u>per</u> \$100k
\$300,000	7
\$400,000	6
\$500,000	6
\$600,000	7
\$700,000	8
\$800,000	9
\$900,000	10

MAXIMIZE YOUR COMMISSIONS

By focusing on \$400,000 listings.

$$\text{Daily Earnings} = \frac{\text{Commissions}}{\text{Time-to-sell}}$$

Daily Commissions/Earnings based on Listing Price

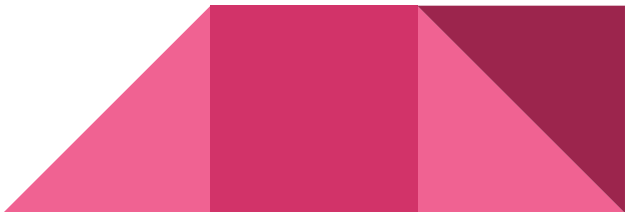


Price	2.5% Commission	Avg. Until Sold	Daily Income
\$100,000	\$2,500	11	\$227
\$200,000	\$5,000	17	\$294
\$300,000	\$7,500	20	\$383
\$400,000	\$10,000	26	\$387
\$500,000	\$12,500	33	\$381
\$600,000	\$15,000	42	\$355
\$700,000	\$17,500	59	\$294
\$800,000	\$20,000	76	\$262
\$900,000	\$22,500	90	\$250

AI-PRAISE models

AI-PRAISE:

- Uses top-of-the-line AI technology built by Google
- Custom Feature Engineering maximizes the power of the model
- We predict: **the Selling Price**
- We predict: **Time-to-Sell**
 - *Probability that the house will sell in 30 days*
 - *Probability that the house will sell in less than 60 days*
 - *Probability that the house will sell in less than 90 days*
- Helps to manage expectations for high-value properties!



AI-PRAISE - Proprietary Scorecard

1404 Stone Street, Capersville, NY 13043						
SQFT	Lot Size	Stories	Built	Bedrooms	Baths	Heating
4,010	8,252	2	2015	5	4.25	Oil

Predicted Price
\$1,050,192

Predicted Time to Sell: 134 Days		
Less Than 30 Days	Less than 60 Days	Less than 90 Days
17%	24%	42%

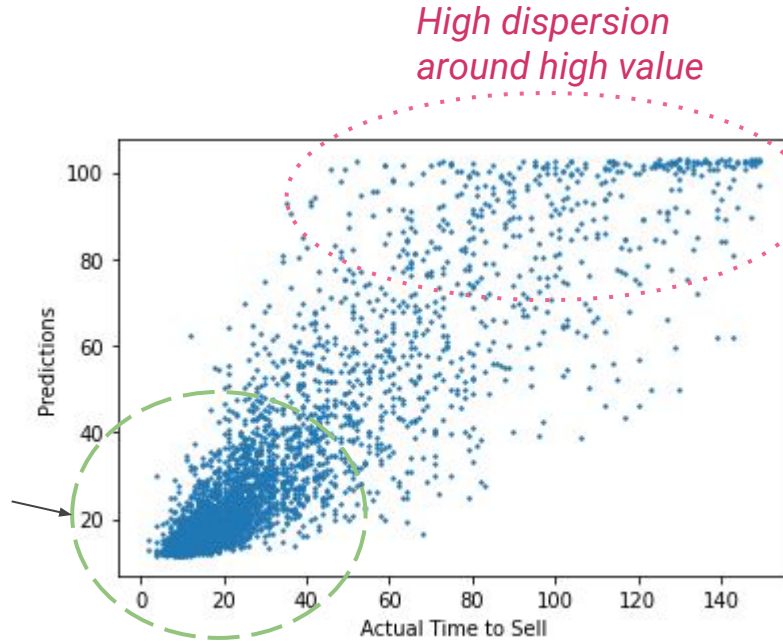
Linda's Properties: Too many High Value = SLOW

Your properties are all very large properties that will take a long time to sell.

Property	Beds	Baths	SQFT Living	SQFT Above	Lot SQFT	Floors	Condition	Built	Predicted Price	Predicted Days
Sequoia Way	5	3	2,660	1,670	7,700	1.5	good	1962	\$509,000	99
Mongrove	5	4.25	4,010	4,010	8,252	2	average	2015	\$1,090,500	103
7th Street	3	3.25	4,720	3,190	32,467	2	average	1998	\$1,340,000	103
Lemon St.	4	3.25	4,110	4,110	15,488	2	average	1995	\$1,620,000	103
Beach Blvd.	3	2.5	4,010	2,600	12,105	1	very good	1983	\$1,707,500	103

Manage your high value customer's expectations

Houses that we predict will sell between 20 and 40 days will generally sell within 20 to 40 days



It's much harder to predict the time-to-sell for High Value properties.

AI-PRAISE

PREDICT

Selling Price

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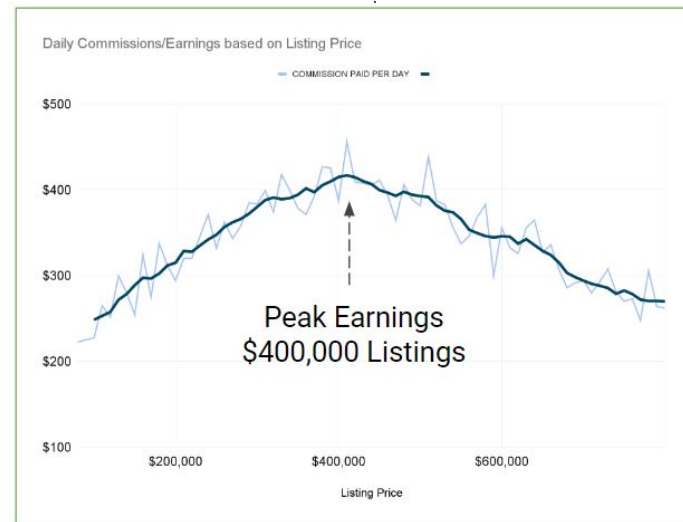
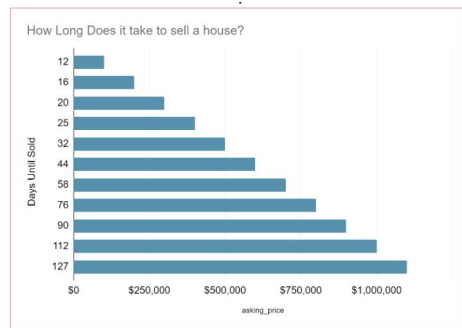
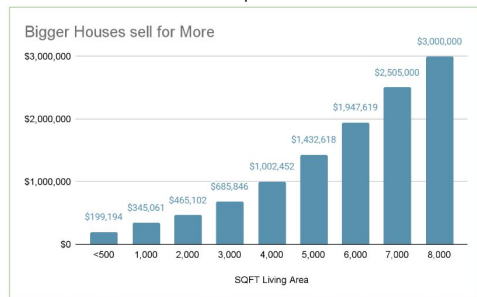
PREDICT

Time-to-Sell



MAXIMIZE

Earnings



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