

# 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:* 2 hidden layers, 1 output layer. 29 features, linear activation
  - *Time-to-sell:* 2 hidden layers, 1 output layer. 36 features.
    - Hidden layers have sigmoid activation; output layer uses linear

# AI-PRAISE

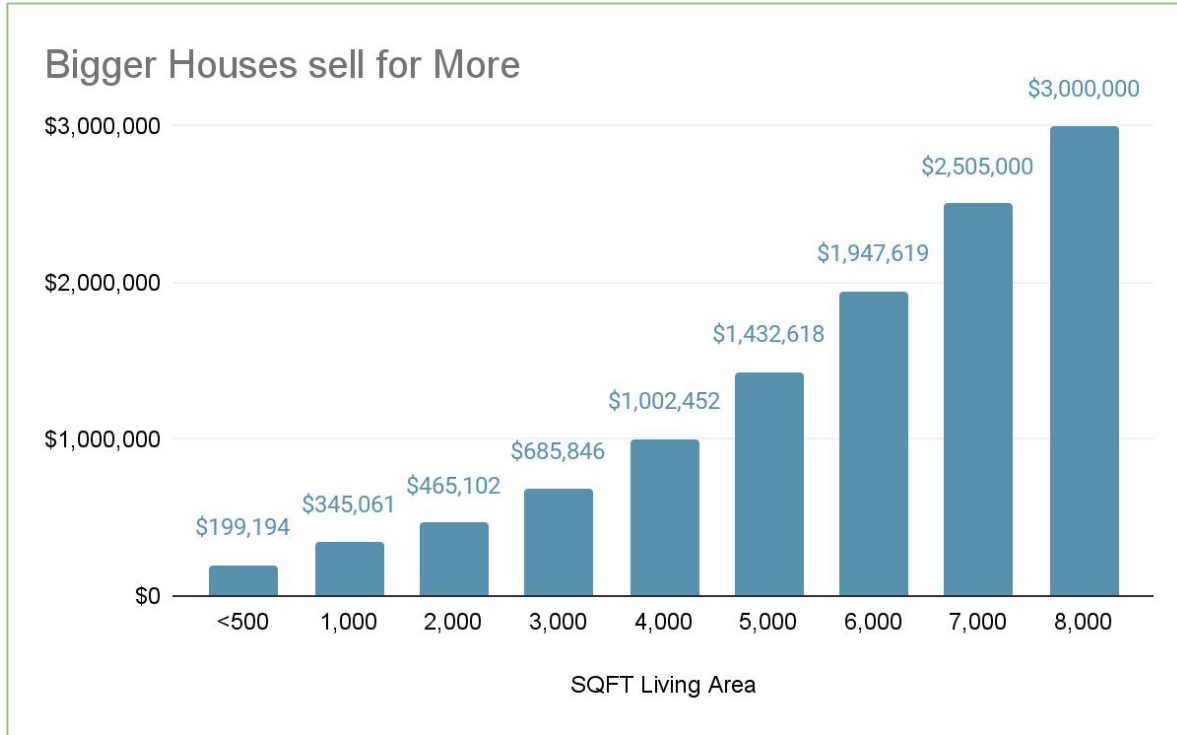
AI-Powered  
Real Estate  
Appraisal Services



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



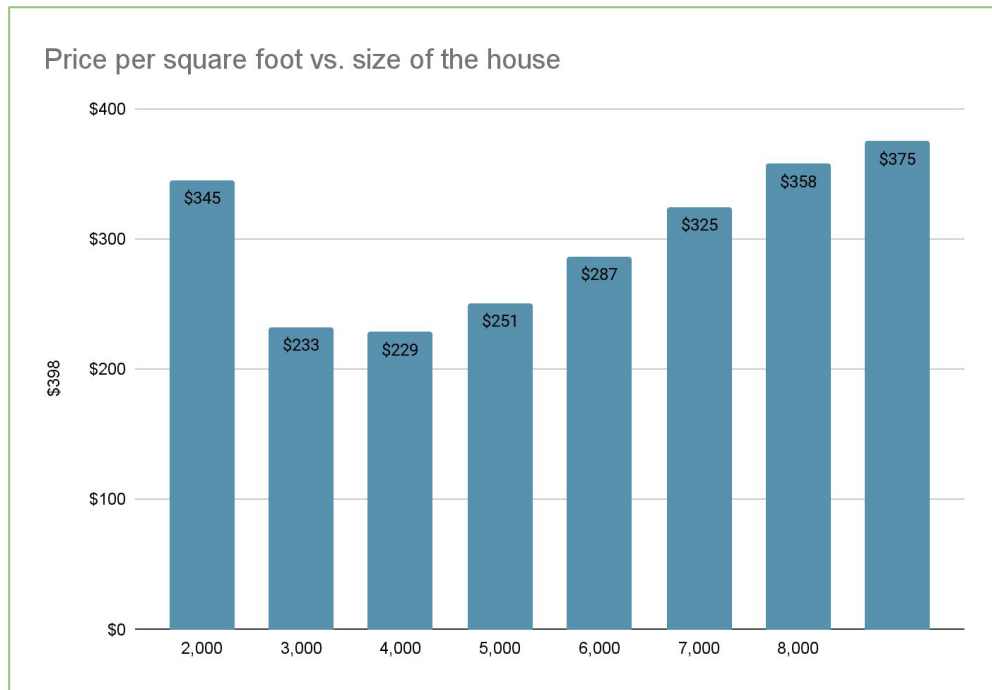
# We all know Bigger Houses sell for more...



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

# SMALLER and BIGGER houses sell for “More”

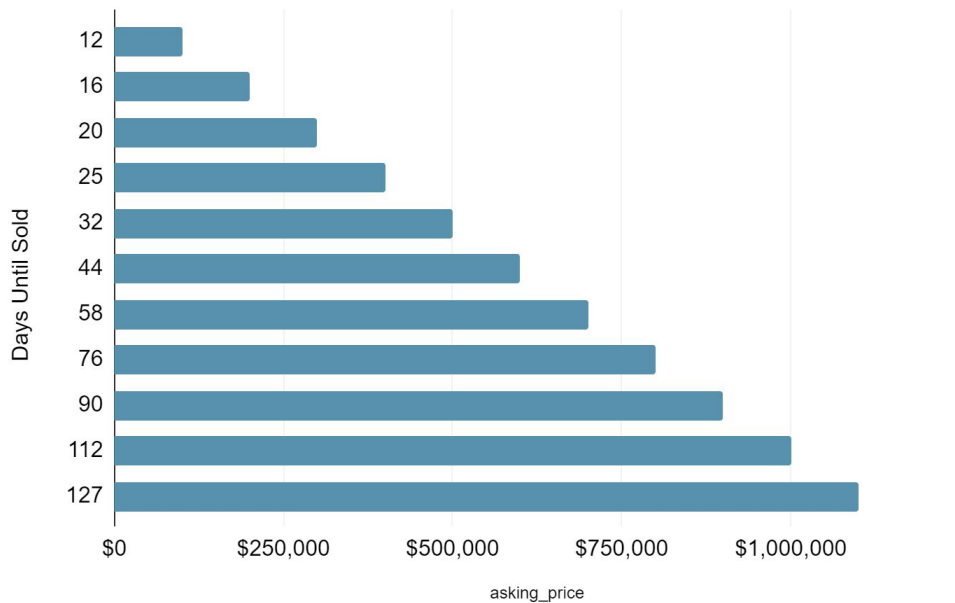
Not all Square Footage is Created Equal!



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?



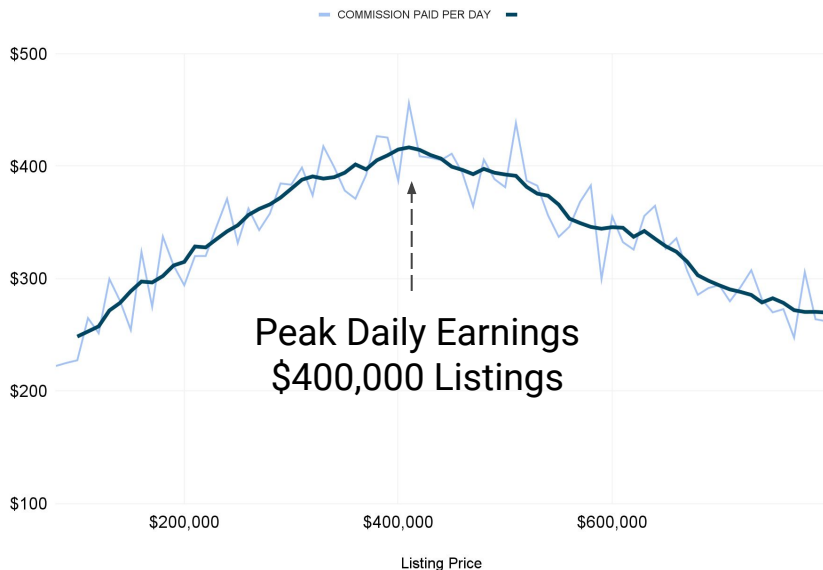
Asking Price	Avg. Days to Sell
\$100,000	12
\$200,000	16
\$300,000	20
\$400,000	25
\$500,000	32
\$600,000	44
\$700,000	58
\$800,000	76
\$900,000	90
\$1,000,000	112

# 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

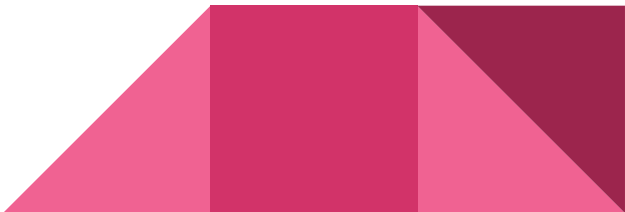


Price	2.5% Commission	Avg. Until Sold	Daily Income
\$100,000	\$2,500	11	\$227
\$200,000	\$5,000	17	\$294
\$300,000	\$7,500	20	\$383
\$400,000	\$10,000	26	\$387
\$500,000	\$12,500	33	\$381
\$600,000	\$15,000	42	\$355
\$700,000	\$17,500	59	\$294
\$800,000	\$20,000	76	\$262
\$900,000	\$22,500	90	\$250

# 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%

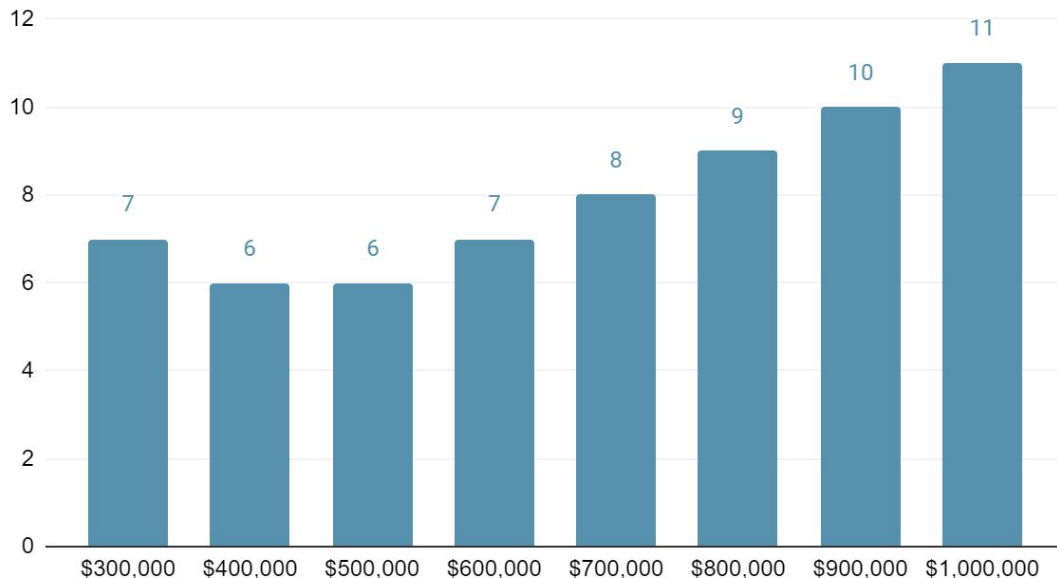
# Linda's Properties: Too many High Value = SLOW

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

# It takes “disproportionately longer” to sell Big Houses!

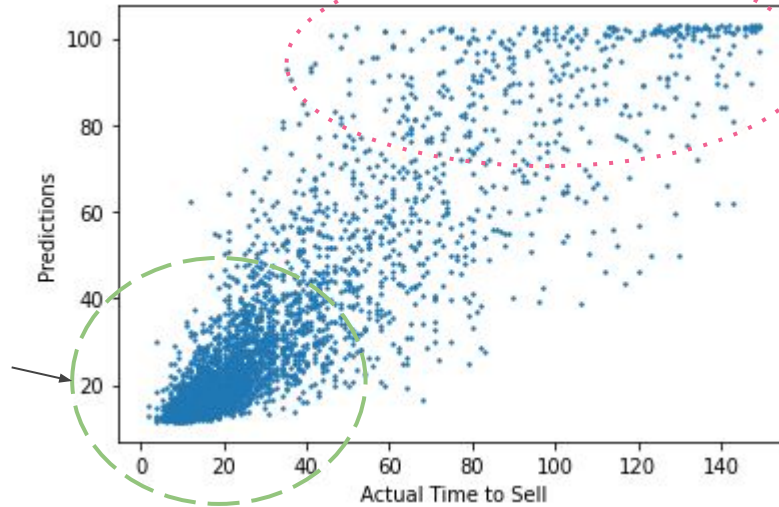
Days per \$100,000 of List Price



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

# 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**



**But it's much harder to predict the time-to-sell for High Value properties.**

*You can show this to your client when they get impatient...*

# AI-PRAISE

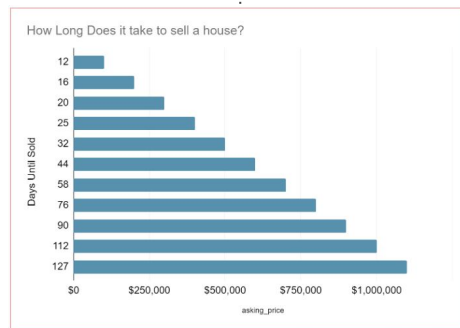
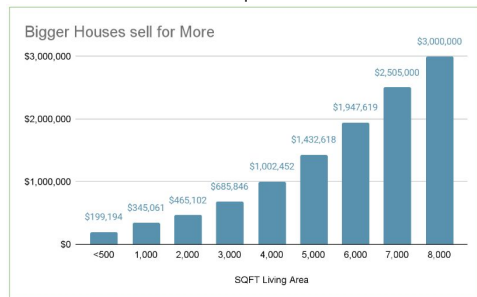
**PREDICT**  
Selling Price

+

**PREDICT**  
Time-to-Sell



**MAXIMIZE**  
Earnings



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