



# Ames House Prices for Home Owners

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Clare, Gerald, Jie Yong



# — Latest Market News —

yahoo/money

## Housing market 'extremely volatile' with private equity accounting for a third of the sales: Expert



Ronda Lee

August 19, 2022 · 2 min read

Inflation and recession fears turned a once **red hot housing market** into a **cool down**.

Fluctuating mortgage rates dropped below 5% and then up again, with the rate on the 30-year fixed mortgage at **5.22% from 4.99% the week prior**.

**"Housing used to be a very stable asset class and now it's extremely volatile,"** Glenn Kelman, CEO at Redfin, told Yahoo Finance Live (video above). "One reason is that institutions used to account for about a quarter of the sales, but now it's about a third. You have real estate investment trusts (REITs) all active in the single family home market."

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- Existing home sales fall 0.4% in August
- Median house price increases 7.7% from year ago
- Housing supply at 1.28 million, unchanged from year ago

REAL ESTATE

## Homeowners lose wealth as rising interest rates weigh on home values

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### KEY POINTS

- Some homeowners are losing wealth as high mortgage rates weigh on home values, at least on paper, as the once red-hot housing market cools.
- Sales have been slowing down for several months, with mortgage rates now double what they were at the start of this year.
- Data suggests so-called tappable home equity may have peaked in May

TV  
The News W  
Shepard Smi  
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# The Challenge

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Home owners are facing issues valuing their property due to the recent volatility of the housing market in the US. Our model will assist homeowners with getting the best price based on the latest market situation.

Our model takes into account the location, condition, age and much more to predict the price.

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# Our Mission

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We are Blackfin, a *data first* real estate company.

We are here to help *you*, the homeowner, to get the best value for your property in the market through renovation, interior design and optimized property listings.



# — Scope —

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1. Data Cleaning & Modifications
2. Exploratory Data Analysis
3. Modeling
4. Conclusions derived
5. Next steps





# Data Cleaning & Modifications



# Data Cleaning

1. Replacing null values
  - a. Understanding the Data Dictionary from Kaggle
  - b. Most null values corresponded to 'NA'
  - c. Determine missing values
2. Identifying & Removing outliers
3. Identifying Features with Multicollinearity
4. Dummify Dataset
5. Scaling Numerical Features

- BsmtCond: General condition of the basement

- Ex Excellent
- Gd Good
- TA Typical - slight dampness allowed
- Fa Fair - dampness or some cracking or settling
- Po Poor - Severe cracking, settling, or wetness
- NA No Basement



# Exploratory Data Analysis

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## Dataset

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Data set contains information from the Ames Assessor's Office used in computing assessed values for individual residential properties sold in Ames, Iowa from 2006 to 2010.

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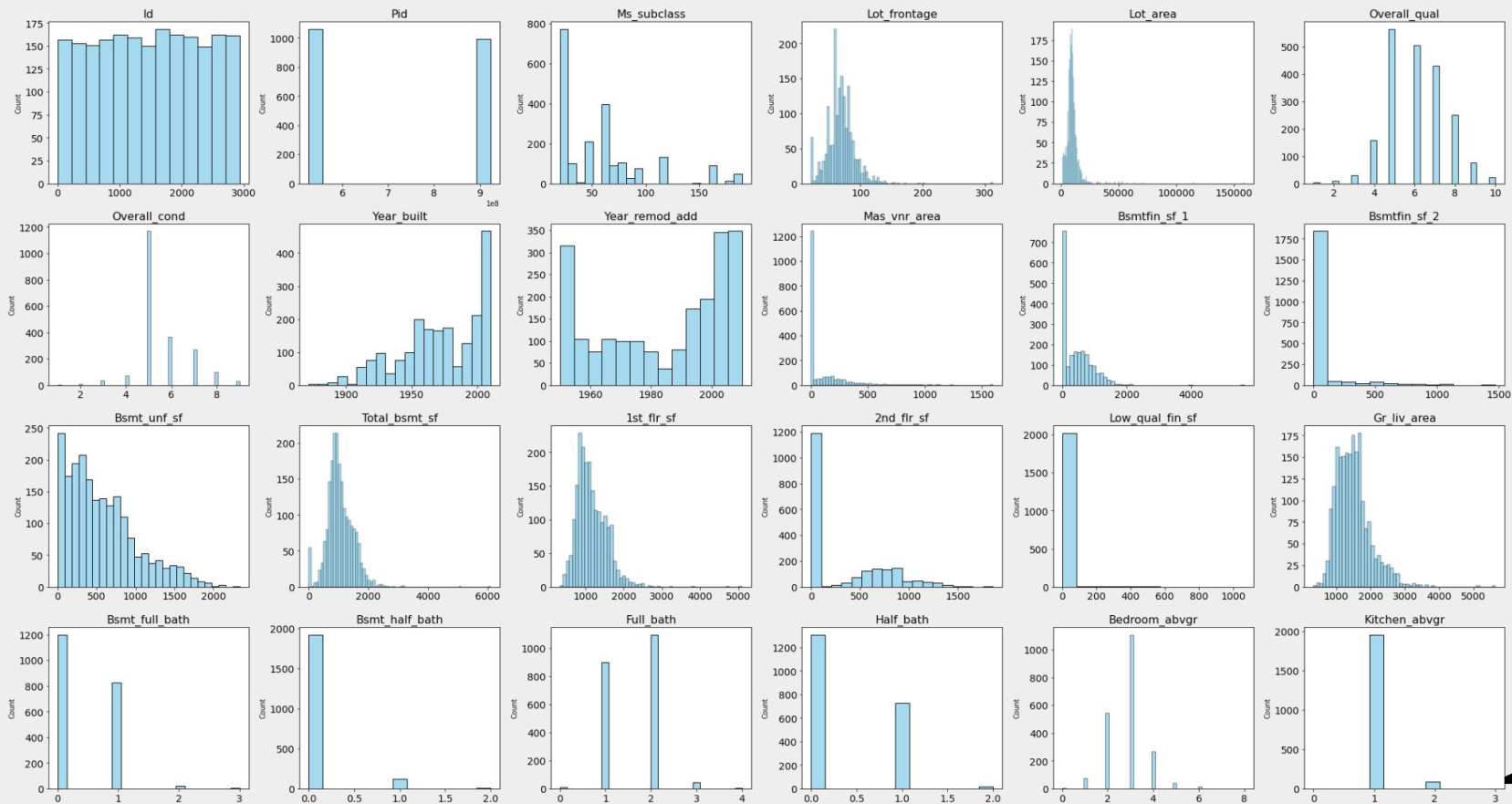
## Data

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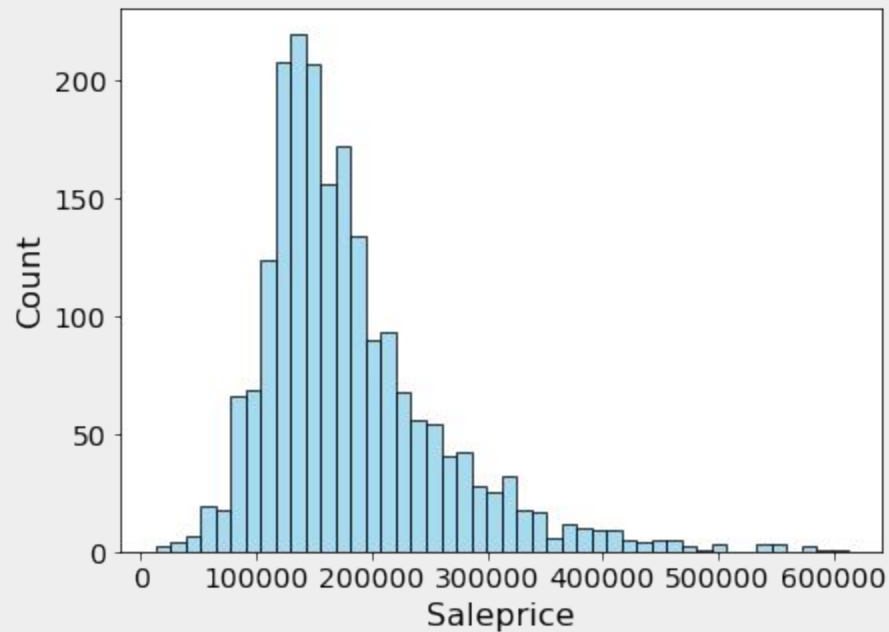
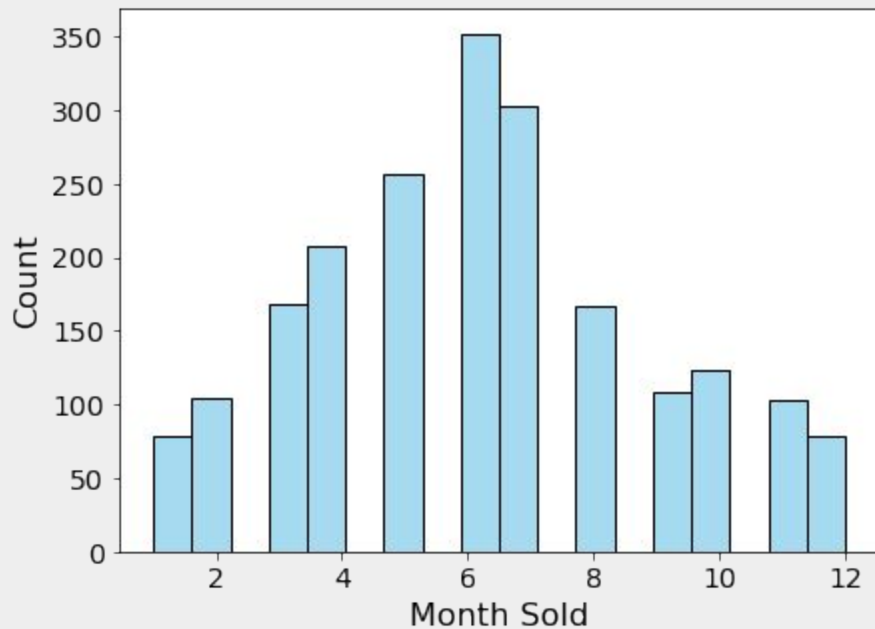
The data has 82 columns which include 23 nominal, 23 ordinal, 14 discrete, and 20 continuous variables (and 2 additional observation identifiers).



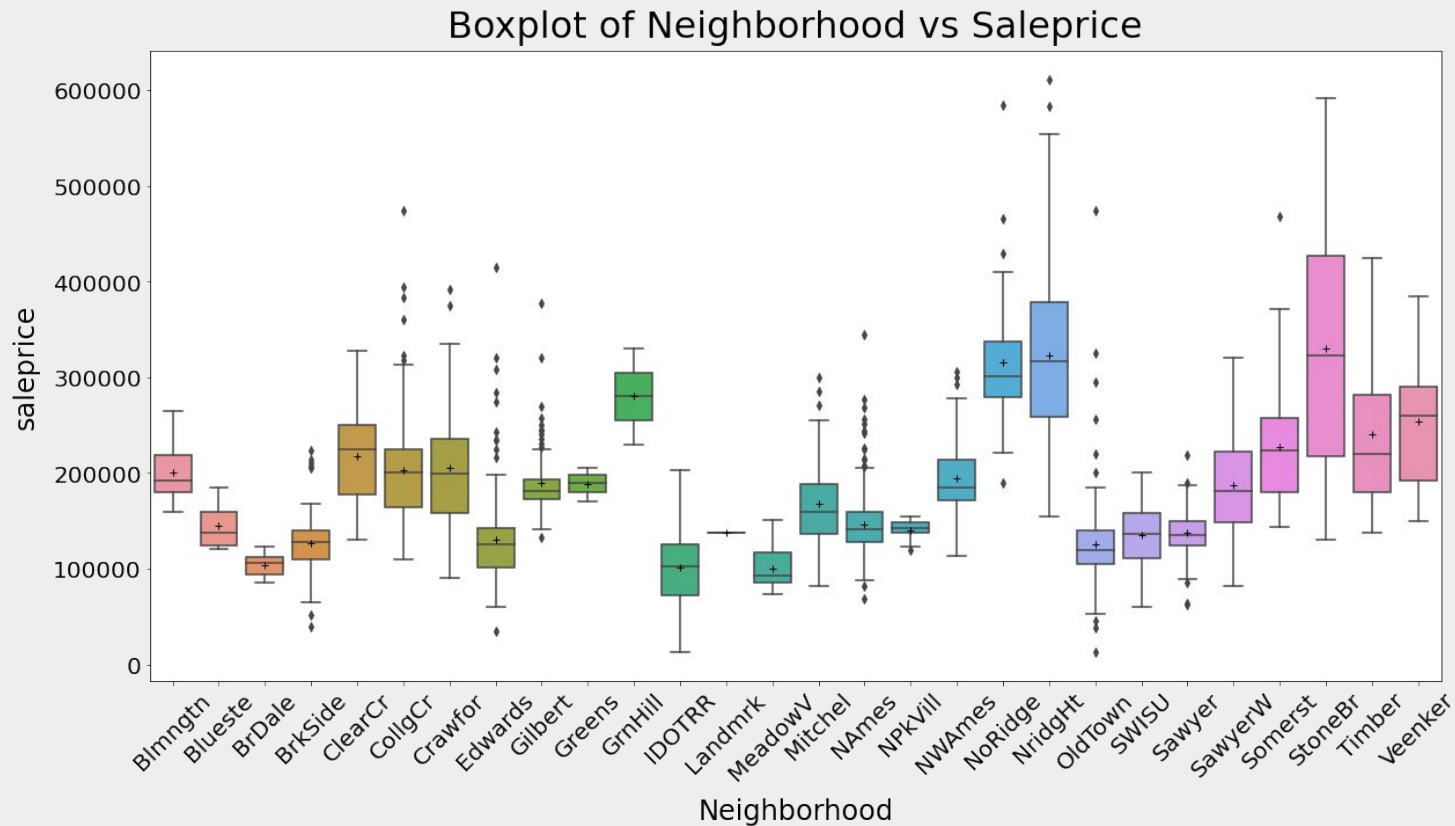
# EDA



# EDA

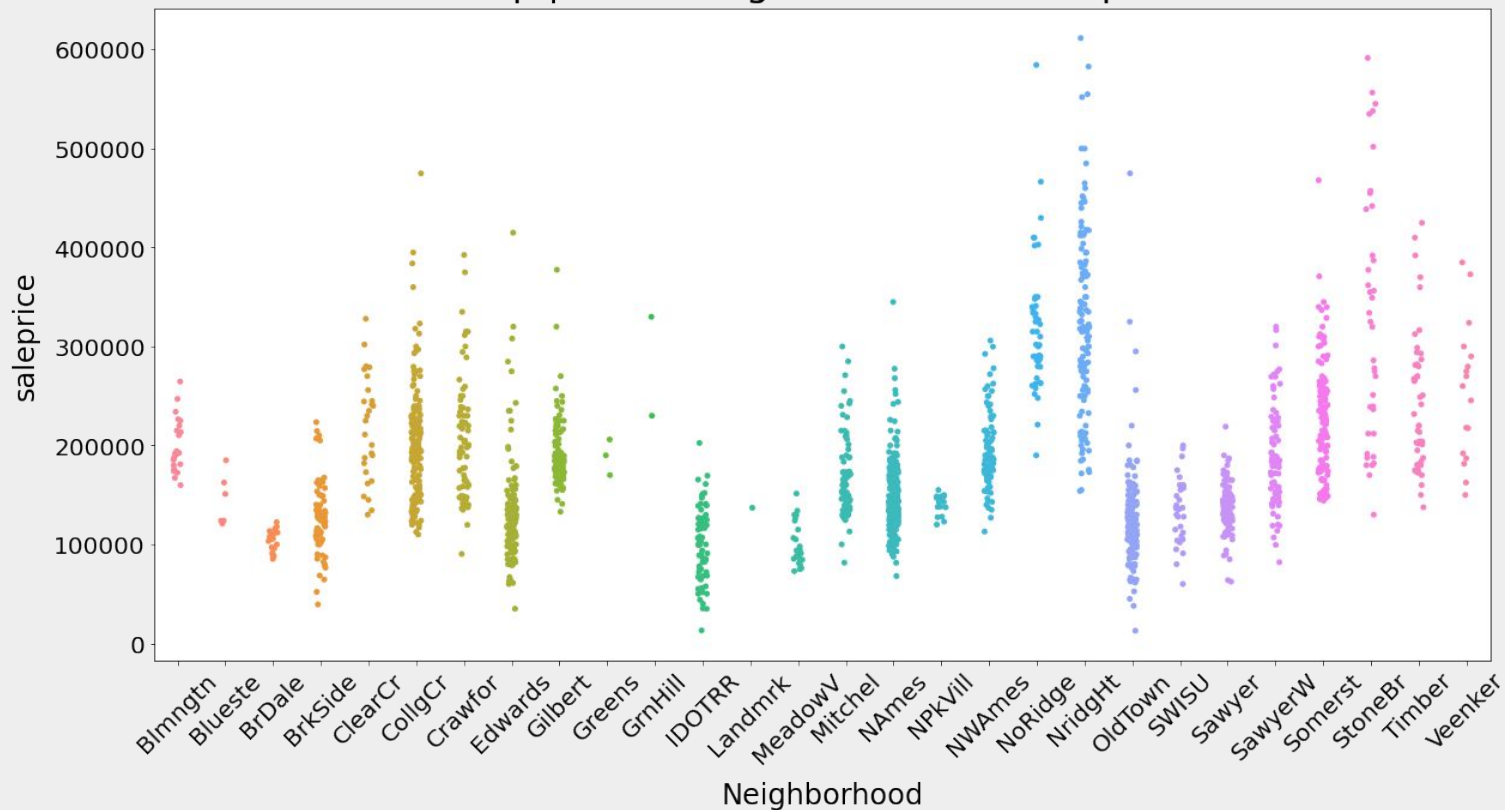


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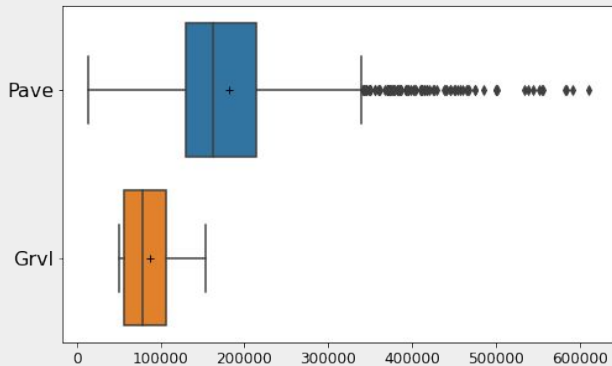
Strip plot of Neighborhood vs Saleprice



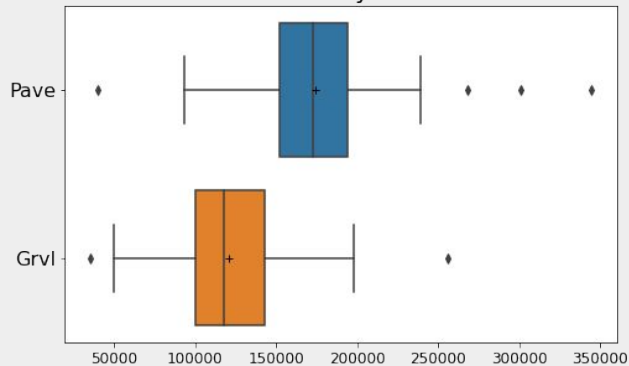


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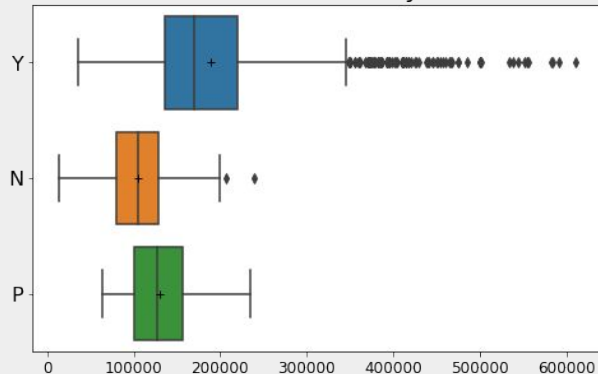
Street



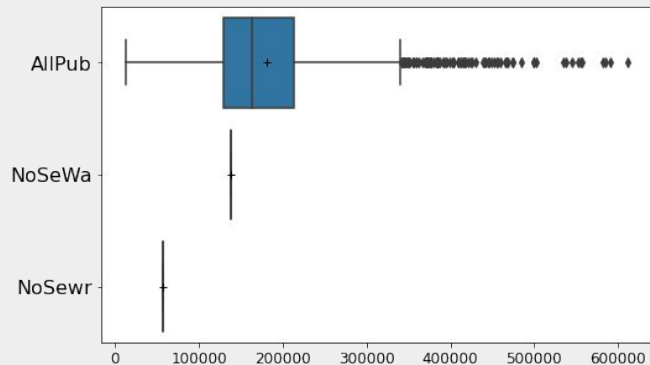
Alley



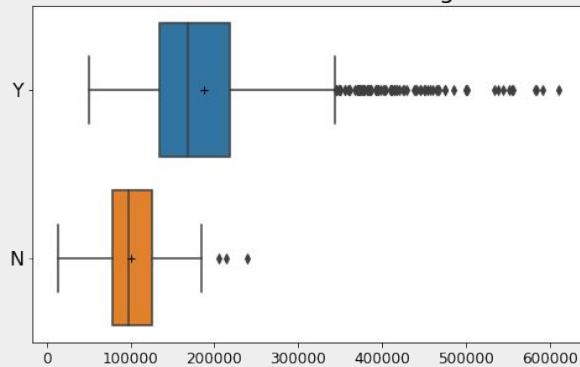
Paved Driveway



Utilities



Central Air-conditioning



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## Keys Takeaway:

1. Number of houses sold occurs most frequently at sale price that is close to \$130k. Nonetheless, there were houses sold more than \$0.5 million.
2. Most houses were sold during June and July.
3. Majority of houses sold were built/remodeled in 20th century with at least an average overall quality and condition.
4. Houses with paved streets/alleys/driveways, equipped with all public utilities and central air-conditioning yield higher sale price than houses without.
5. Green Hills, Northridge, Northridge Height and Stone Brook have significantly higher average sale price compare to the other neighborhoods.

# EDA



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# Modeling





# Modeling



## Hyper-Parameter Tuning

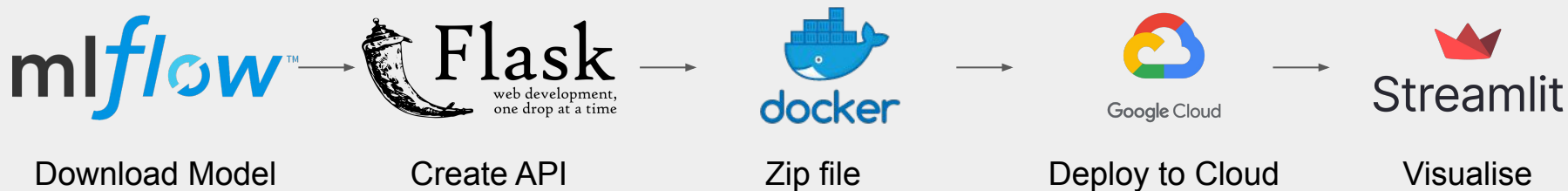
- Preprocessing
- Regression model

Run Name	Source	Models	Metrics	
			R2	↑ RMSE
Bayesian Ridge	C:\Users\...	sklearn	0.938	19403.6
Ridge Regression	C:\Users\...	sklearn	0.937	19625.5
Bayesian Ridge	C:\Users\...	sklearn	0.937	19775.1
Huber Regressor	C:\Users\...	sklearn	0.936	19803.5
Ridge Regression	C:\Users\...	sklearn	0.936	19898.9
Bayesian Ridge	C:\Users\...	sklearn	0.932	20011
Huber Regressor	C:\Users\...	sklearn	0.934	20165.6
Ridge Regression	C:\Users\...	sklearn	0.929	20462.2
Huber Regressor	C:\Users\...	sklearn	0.927	20656.4
Orthogonal Matching Pursuit	C:\Users\...	sklearn	0.928	20941.7
Orthogonal Matching Pursuit	C:\Users\...	sklearn	0.925	21513.6
Orthogonal Matching Pursuit	C:\Users\...	sklearn	0.92	21657.6
Gradient Boosting Regressor	C:\Users\...	sklearn	0.92	22076.5

# — Modeling —

Model	Best Regression	CV R2 result	Kaggle Private Score (RMSE)
Baseline model	Linear Regression	-6052502.05	415522585.39
GridSearchCV	Linear Regression	0.85	26206.55
Multi Regression GridSearchCV	ElasticNet	0.87	24219.97
Baseline Pycaret	Gradient Boosting Regressor	0.91	21867.08
Pycaret w/o outliers	Bayesian Ridge	0.92	22611.63
<b>Pycaret w scaling &amp; selection*</b>	Bayesian Ridge	0.93	17983.57

# — Modeling —



Enter  
**BLACKFIN**

# — Challenge

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Get the **Highest Valued House** in Ames



2 Mins starts now!





# — Conclusion —

Features more effective in affecting sale price



**Neighborhood  
(StoneBrook)**



**Size**



**Year Built**

# — Conclusion —

Focus on what you can control. Budget using our tool



**Exterior Quality**



**Kitchen**



**Basement**

# — Next Steps —

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- Update datapoints to more recent time period
- More feature engineering
  - Total years lived in = year sold - year built
  - Total Interior square footage = TotalBsmtSF + GrLivArea + GarageArea
  - Total Exterior square footage = LotArea + MasVnrArea + WoodDeckSF + OpenPorchSF + EnclosedPorch + 3SsnPorch + ScreenPorch + PoolArea
- Model to take into account macro economic factors
  - Interest Rates
  - Inflation Rates
  - GDP
  - Unemployment Rates
- Enquiry form for interested homeowners to contact Blackfin



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**List with us today!**

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