PREDICTING HOUSE PRICES USING ADVANCED REGRESSION TECHNIQUES

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Introduction

Exploratory Data analysis

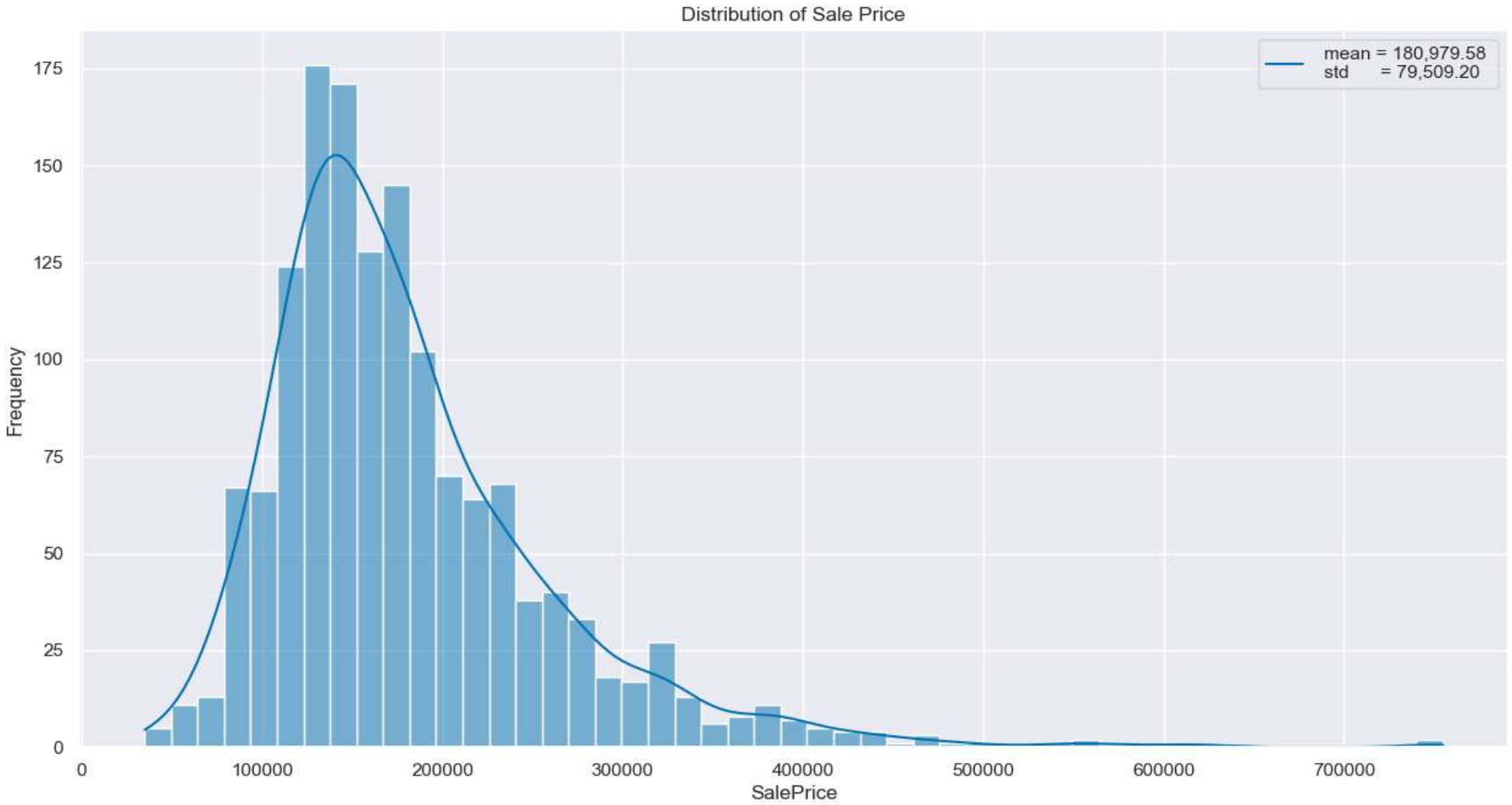
Linear Regression Model

Business recommendation

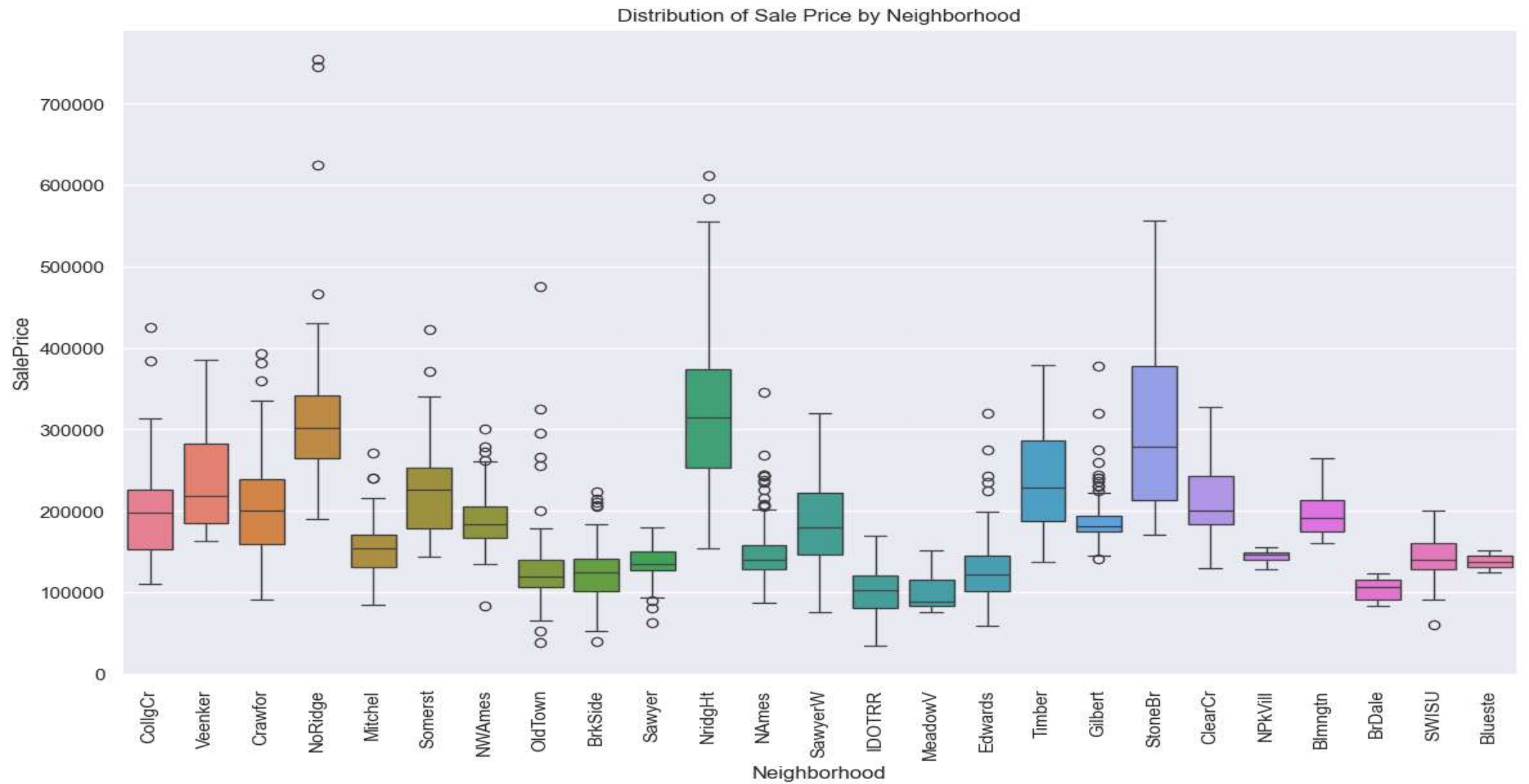
INTRODUCTION:

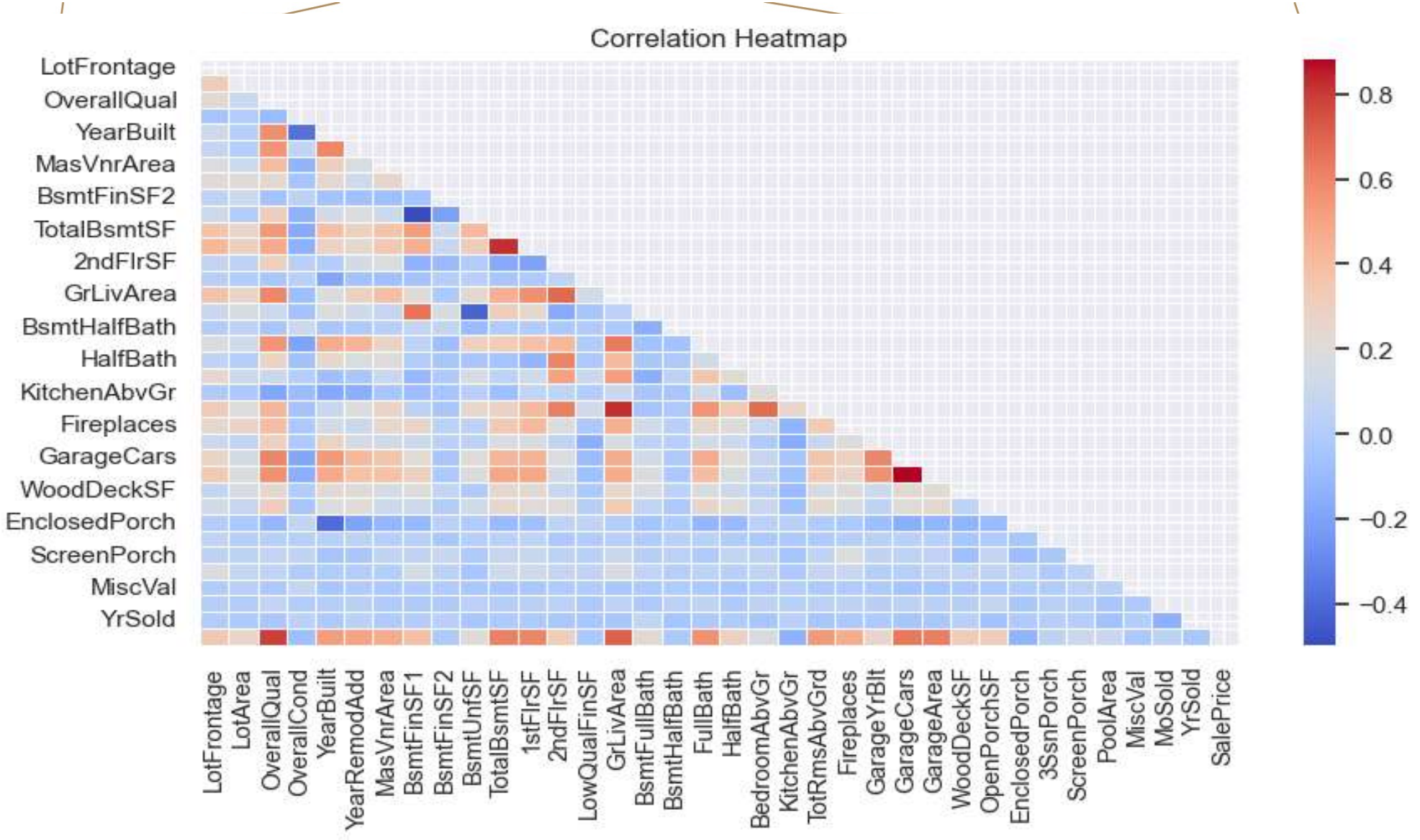
THE REAL ESTATE MARKET IS COMPLEX AND EVER-CHANGING, WITH VARIOUS FACTORS IMPACTING HOME PRICES. ACCURATELY PREDICTING THESE PRICES IS ESSENTIAL FOR BUYERS, SELLERS, REAL ESTATE AGENTS, AND INVESTORS. THE HOUSE PRICE PREDICTION MODEL IS DESIGNED TO OFFER RELIABLE PRICE ESTIMATES BASED ON A COMPREHENSIVE SET OF FEATURES, ENABLING REAL ESTATE COMPANIES TO ACCURATELY VALUE PROPERTIES FOR SALE.

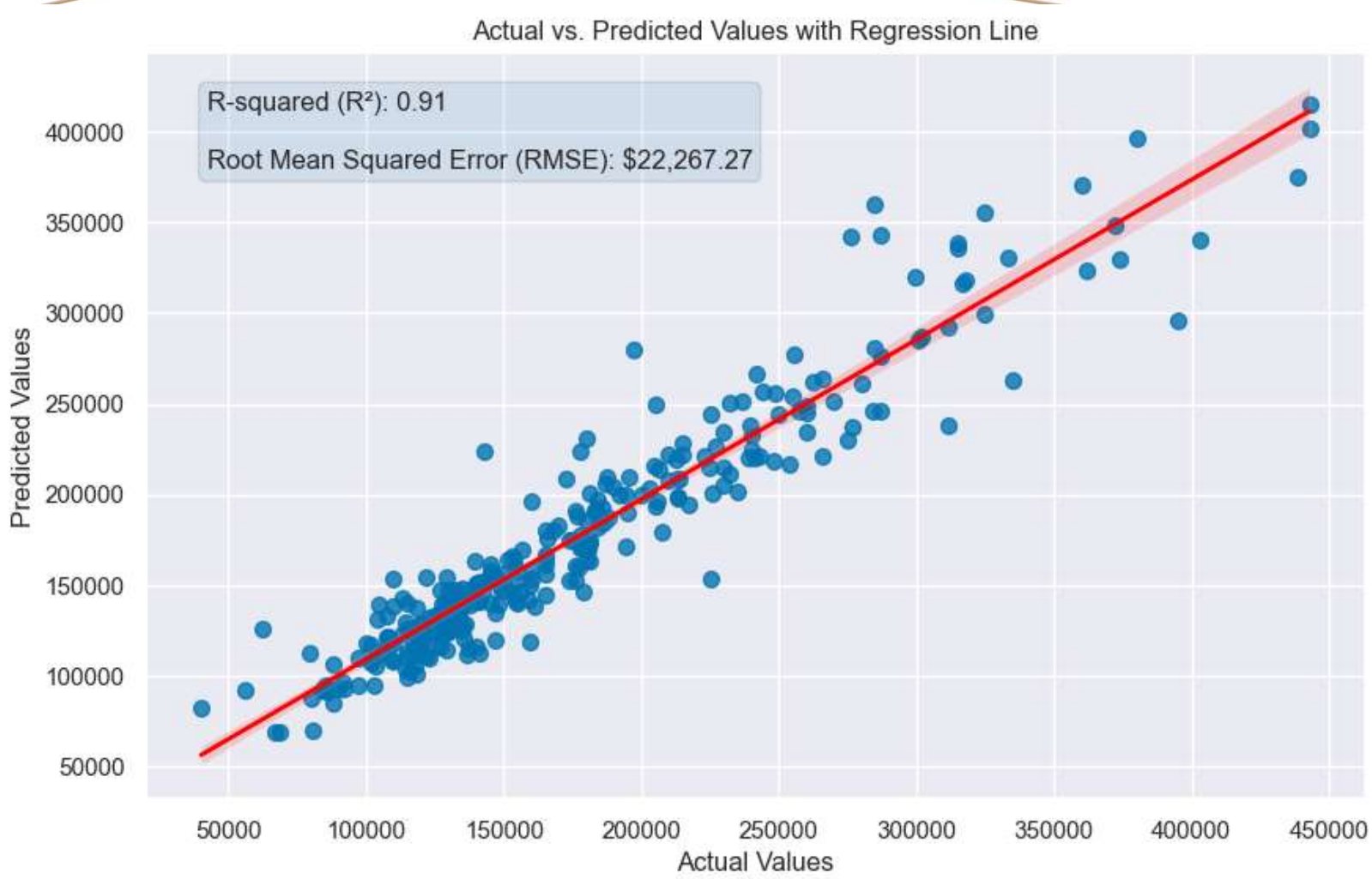
TARGET VARIABLE

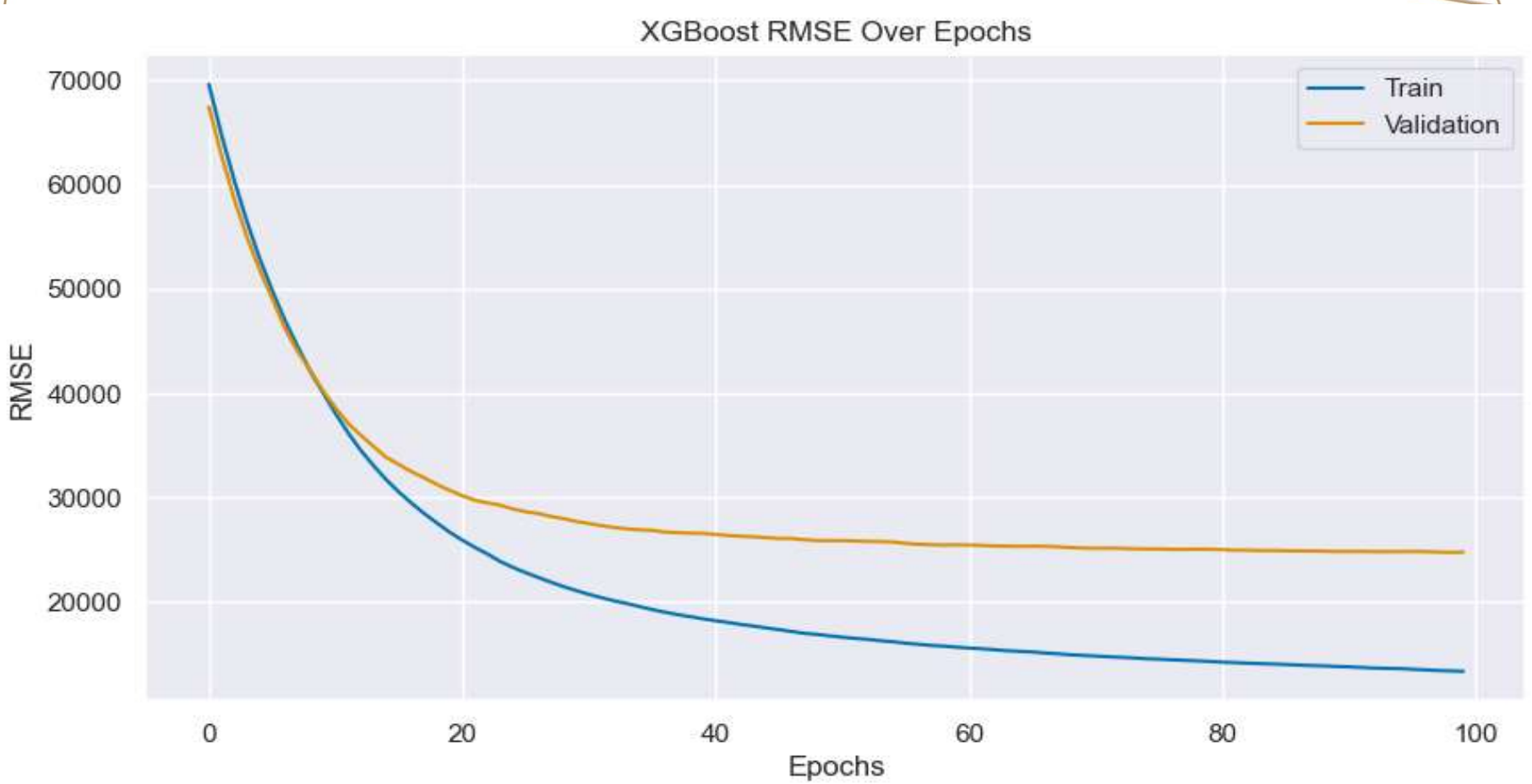


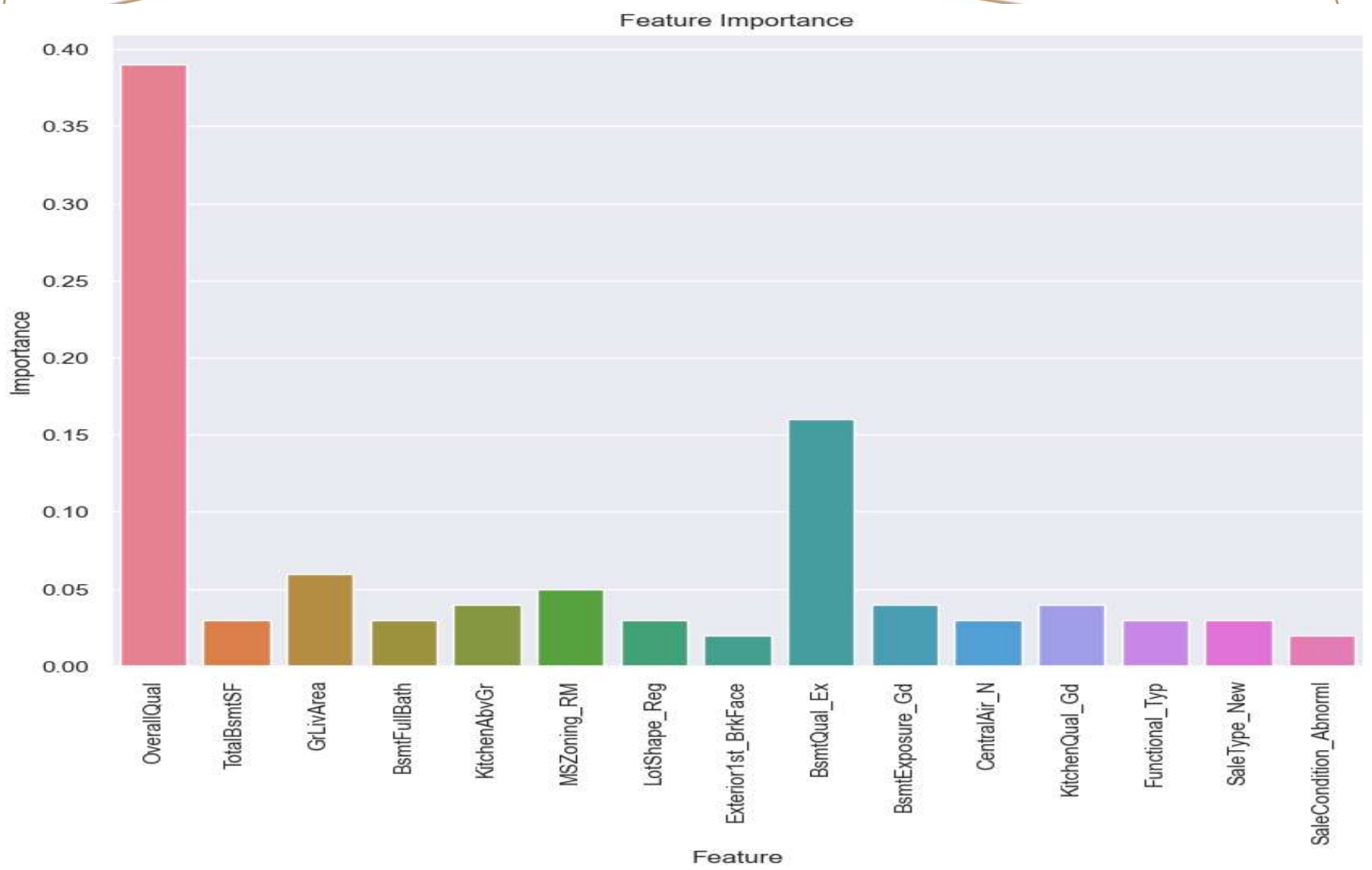
FEATURES`


Distribution of Sale Price by Neighborhood
SalePrice
0
100000
200000
300000
400000
500000
600000
700000
CollgCr
Veenker
Crawfor
NoRidge
Mitchel
Somerst
NWAmes
OldTown
BrkSide
Sawyer
NridgHt
NAmes
SawyerW
IDOTRR
MeadowV
Edwards
Timber
Gilbert
StoneBr
ClearCr
NPkVill
Blmngtn
BrDale
SWISU
Blueste
Neighborhood


Correlation Heatmap
LotFrontage
OverallQual
YearBuilt
MasVnrArea
BsmtFinSF2
TotalBsmtSF
2ndFlrSF
GrLivArea
BsmtHalfBath
HalfBath
KitchenAbvGr
Fireplaces
GarageCars
WoodDeckSF
EnclosedPorch
ScreenPorch
MiscVal
YrSold
LotFrontage
LotArea
OverallQual
OverallCond
YearBuilt
YearRemodAdd
MasVnrArea
BsmtFinSF1
BsmtFinSF2
BsmtUnfSF
TotalBsmtSF
1stFlrSF
2ndFlrSF
LowQualFinSF
GrLivArea
BsmtFullBath
BsmtHalfBath
FullBath
HalfBath
BedroomAbvGr
KitchenAbvGr
TotRmsAbvGrd
Fireplaces
GarageYrBlt
GarageCars
GarageArea
WoodDeckSF
OpenPorchSF
EnclosedPorch
3SsnPorch
ScreenPorch
PoolArea
MiscVal
MoSold
YrSold
SalePrice
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4


Actual vs. Predicted Values with Regression Line
R-squared (R²): 0.91
Root Mean Squared Error (RMSE): $22,267.27
Predicted Values
Actual Values
50000
100000
150000
200000
250000
300000
350000
400000
450000


XGBoost RMSE Over Epochs
Train
Validation
RMSE
70000
60000
50000
40000
30000
20000
0
20
40
60
80
100
Epochs


Feature Importance
Importance
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
OverallQual
TotalBsmtSF
GrLivArea
BsmtFullBath
KitchenAbvGr
MSZoning_RM
LotShape_Reg
Exterior1st_BrkFace
BsmtQual_Ex
BsmtExposure_Gd
CentralAir_N
KitchenQual_Gd
Functional_Typ
SaleType_New
SaleCondition_Abnorml
Feature

THANK YOU