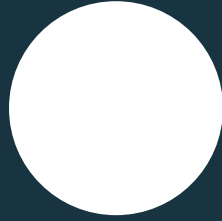# Project 2

Project 2: Ames Housing Data
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PROBLEM STATEMENT

A real estate agent in Ames is working with first-time homebuyers who qualified for the city's Homebuyer Assistance Program (HOME). The homebuyers are creating a list of house features that are important to them in order to narrow down the list of homes to visit. To make a more informed and realistic list of must-haves and good-to-haves, the family requested information on current trends in home sales. Based on historical home sales in Ames, what are some features that are more likely to increase the cost of a home?

Home Investment Partnership Grant (HOME) Homebuyer Assistance Program

1. Homebuyer must be at or below 80% of the area median income limits to qualify for this program.

2. Most recently, for a family of 4, gross income should not exceed $71,950

3. Financial assistance may cover down payment costs, closing costs, interest rate payments, etc.

4. Property must be a single-family home, town-home, or modular home

5. There are other assistance programs available not through the city of AMES, but through other entities.

Process

| Data Collection & Cleaning | EDA & Pre-Processing | Modeling | Insights & Recommendations |

Data Collection & Cleaning

- used provided Ames Housing training dataset for exploration & modeling.
- used testing csv to make predictions on sales price based on model.
- addressed nulls
- renamed columns
- dropped columns/rows

EDA & Pre-Processing

- scatter, box plots, bar plots to explore data
- transformed the data: manufactured new features, SimpleImputer, OrdinalImputer, dummied columns, StandardScaler)
- utilized correlation heatmap & Variance Inflation Factor for feature selection

Modeling

- tested & evaluated using linear regression, ridge, gridsearchcv using lasso estimator, and ElasticNet

Insights & Recommendations

Coming up!

Historically, homes purchased in Ames as low-interest and/or low-down payment sale status were under ~$250K

Homes Purchased With Low-Interest and/or Low-Down Payment
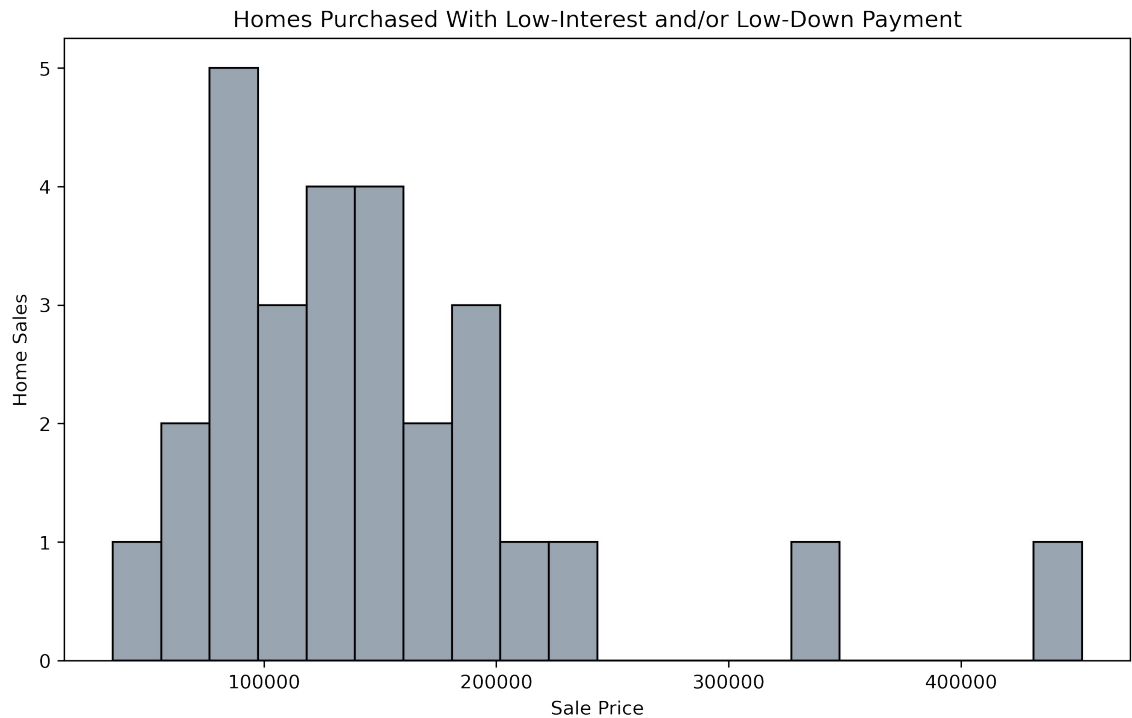
What Features May Homebuyers Care About?

NEIGHBORHOOD

Housing prices typically differ by neighborhood. What neighborhoods may not be in my price range?
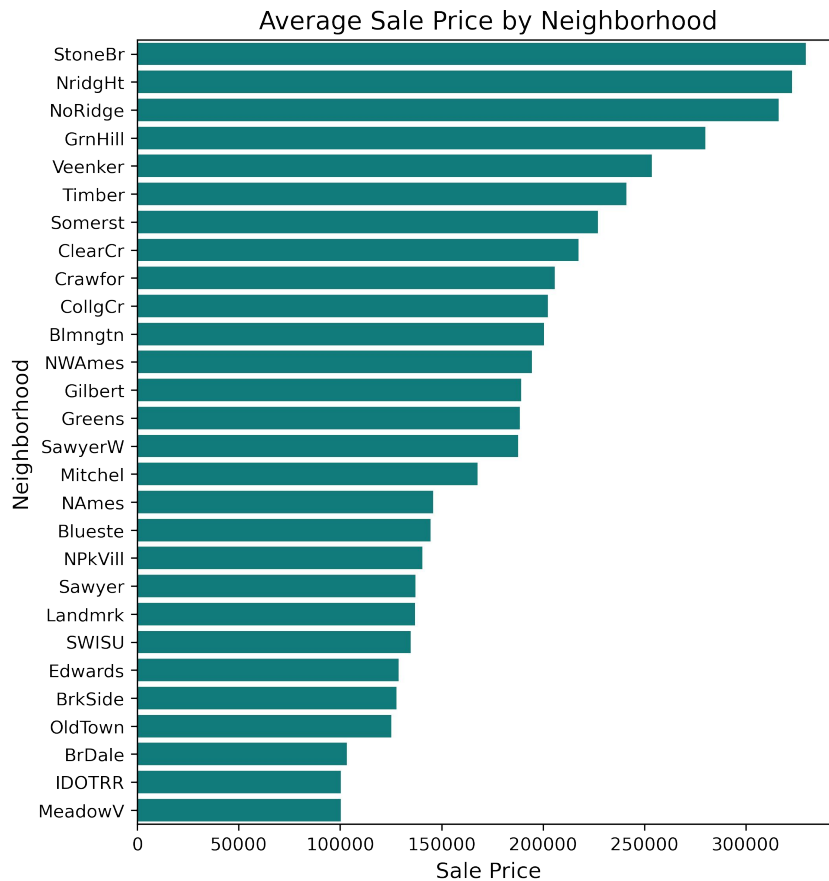
HOUSE TYPE

Single Family
Townhomes
Duplex

GARAGE

It gets cold in the midwest, is an attached garage a reasonable must-have feature?
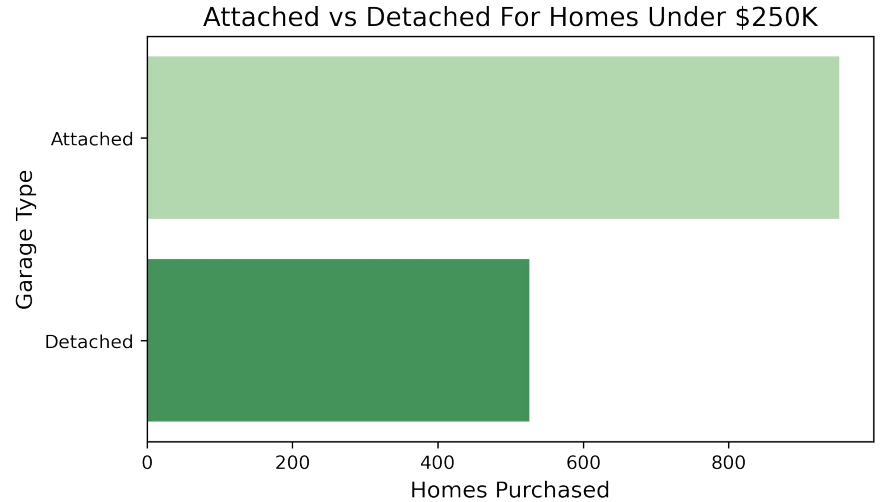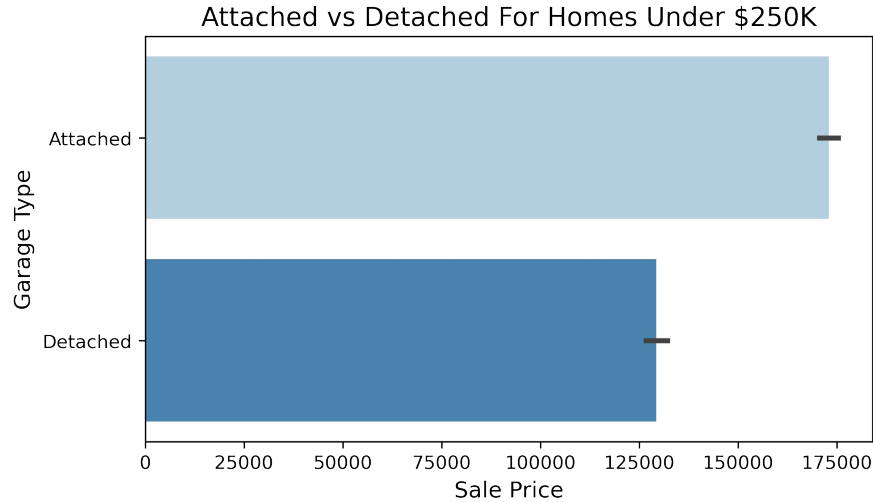
Homes in Stone Brook, Northridge Heights, & Northridge see the highest average home sale prices & are the strongest neighborhood predictors of sale price.

Average Sale Price by Neighborhood

75% of all building types were purchased for ~$250K or less.

Range of Sale Price by Building Type
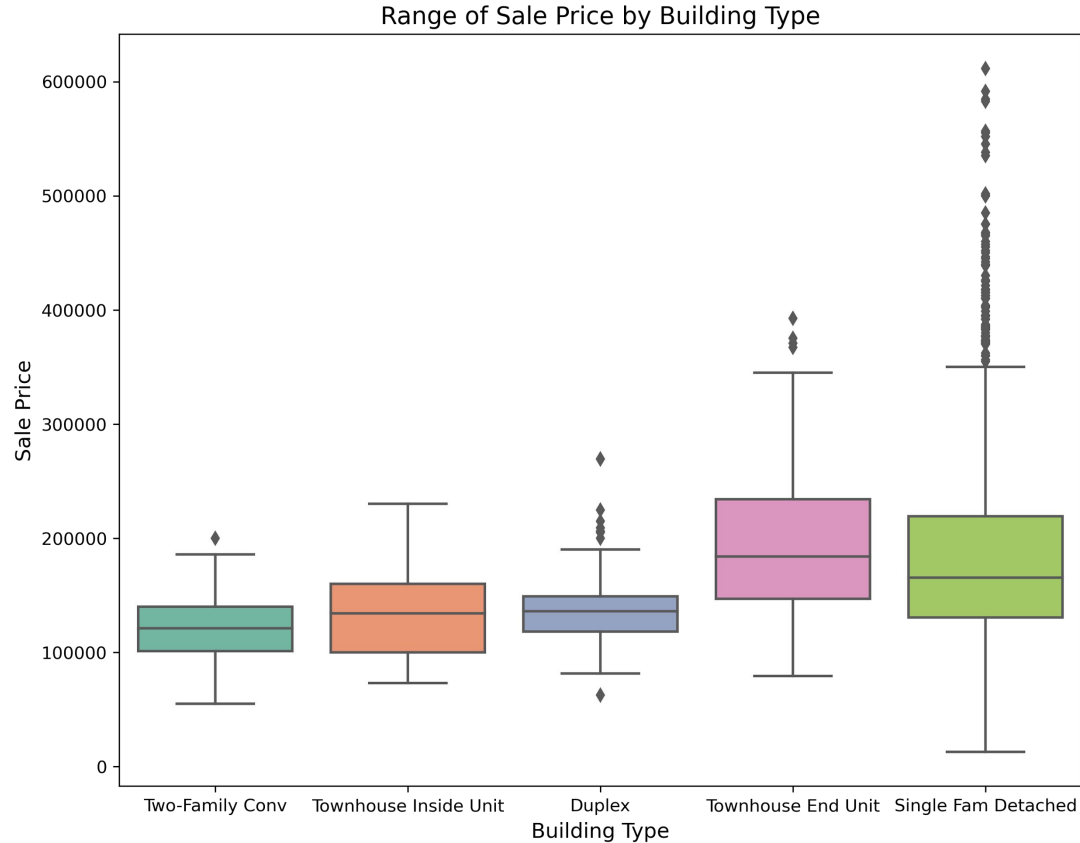
For $250K or less, homes with an attached garage have a higher sale price & almost double the availability than homes with detached garages.

Attached vs Detached For Homes Under $250K

Attached vs Detached For Homes Under $250K

Recommendations

1. Neighborhood selection is important in guaranteeing a home price in range. Homebuyers should try to look in neighborhoods other than Stone Brook, Northridge Heights, and Northridge.

2. An attached garage is a feature that will increase the cost of sale price, but is reasonable to be included in the list of must-haves because it is more common for a home to have an attached garage than not.

3. Homebuyers don't need to be selective about house type because there are homes within a reasonable price range for all building types. But single family & end-unit townhomes will see higher prices.

Questions?

Sources

City of Ames – Homebuyer Assistance Program – Administrative Guidelines (source)
City of Ames – Homebuyer Assistance Program Application (source)