



Investment for mortgage-back securities

By Adrian Sealy

Summary



Business objectives



Hypotheses



Data/methods



Results/recommendations



Business objectives

- How to allocate dollars earmarked for investment into mortgage-back securities
- Investigate the factors that drive home prices
- What different independent variables influence the average sale prices of houses in Ames city?



Hypotheses

- H1: When looking at the mean of sale prices between neighborhoods there isn't a significant difference between Northridge Heights and College Creek

Ha: There is a significant difference between the mean of sale prices between Northridge Heights and College Creek

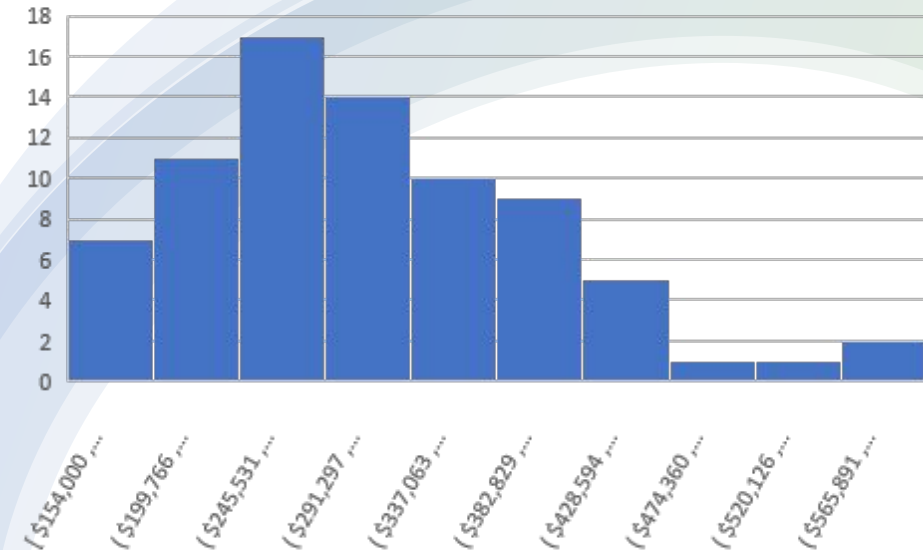
- H2: The mean of sale prices of houses built and remodeled ≥ 2000 (Year) = the mean sale prices of the houses built < 2000 and remodeled ≥ 2000

Ha: The mean of sale prices of the houses built and remodeled ≥ 2000 is \neq the mean of sale prices of the houses built < 2000 and remodeled ≥ 2000

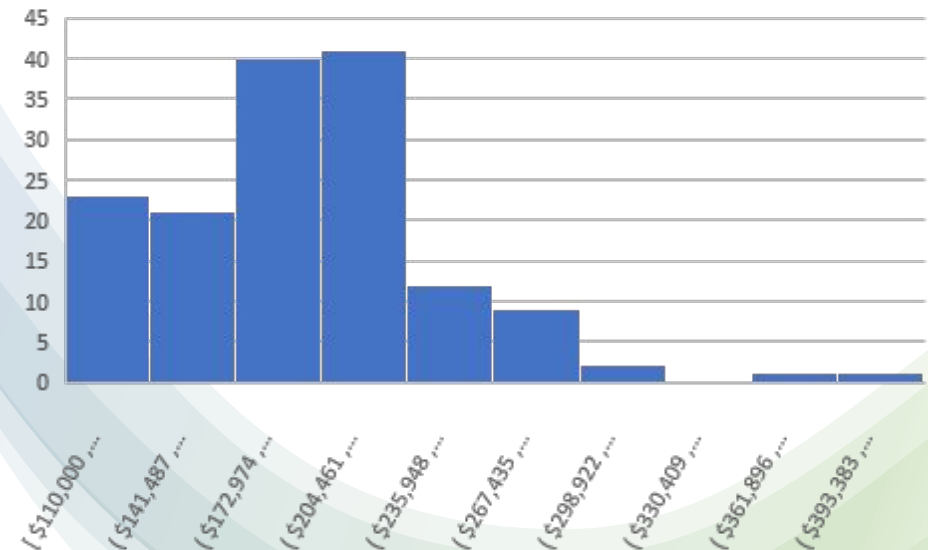
Neighborhood Data

- By neighborhood we're looking at Northridge Heights (NridgHt) and College Creek (CollgCr) with the sum of sale prices
- Data for both neighborhoods are roughly normally distributed and show 30+ observations
- Data was collected from houses sold between January of 2006 to July of 2010
- Obtained a total of 227 samples

NridgHt Sample Sales price Histogram



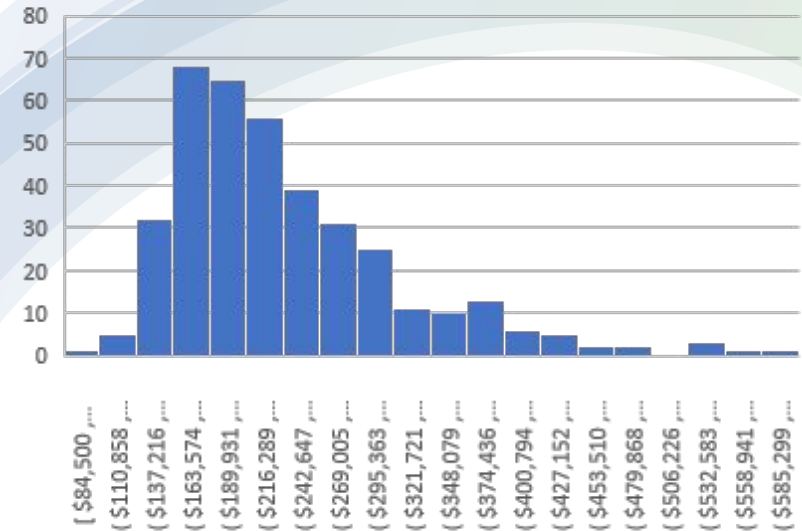
CollgCr Sample Sales price Histogram



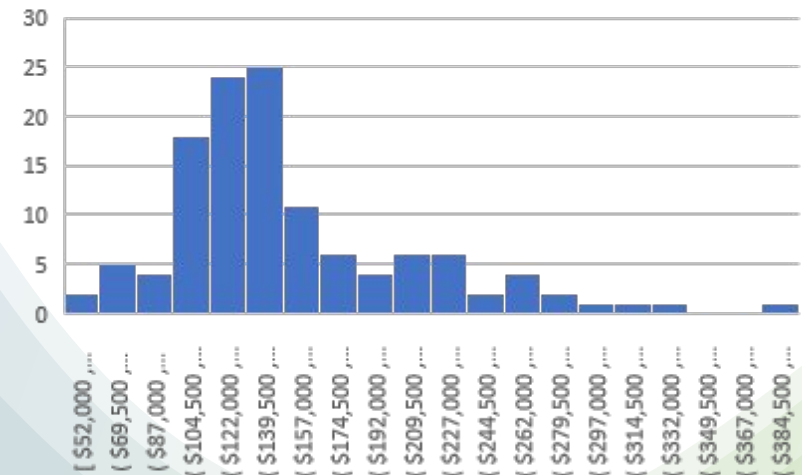
Year Built and Year Remodeled Data

- What the two samples have shared are house styles of one story (1 story) and two-story (2 story). Also, years remodeled being from 2000-2010.
- What's different is one sample contained houses built after 2000 and the other sample contained houses built before 2000.
- Both samples were roughly normally distributed and have 30+ observations
- Total of 499 samples between both populations

House built >=2000 Histogram



House built <2000 Histogram



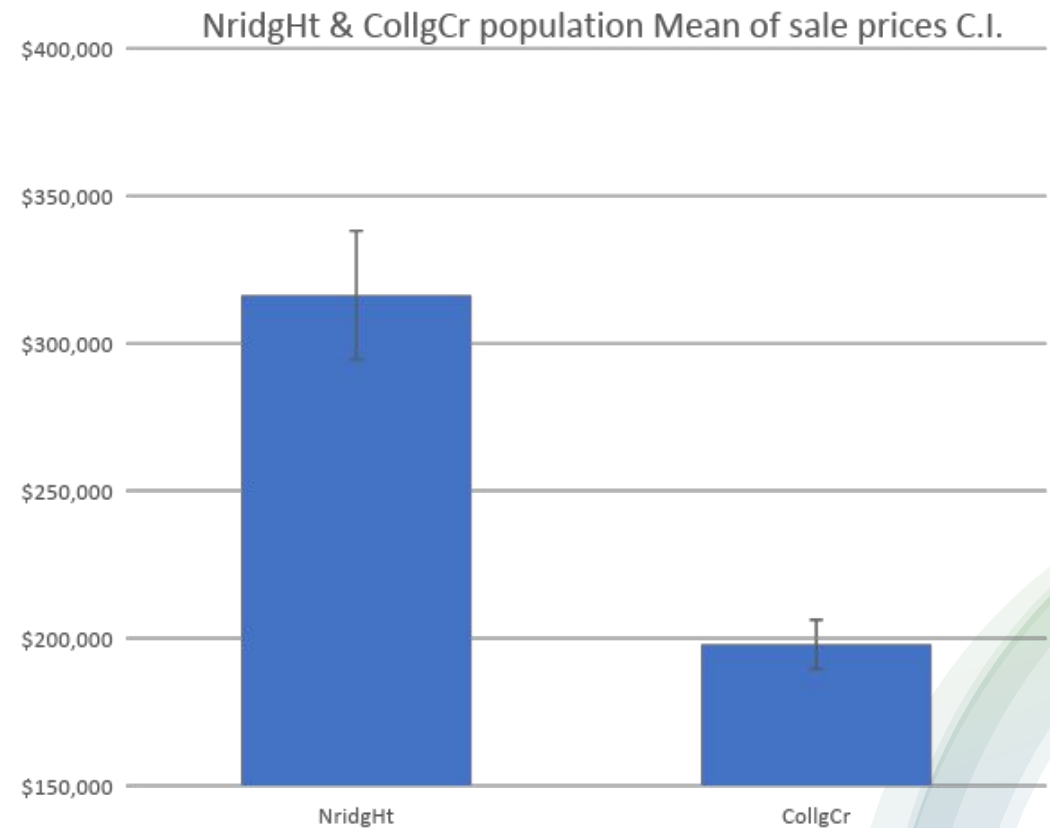


Methods

- Used an independent two tailed t-test for H1 and H2 by using excel's pivot table filtering and analysis ToolPak
- Used visualizations to enhance understanding of the C.I. lower and Upper limit found from the t-test

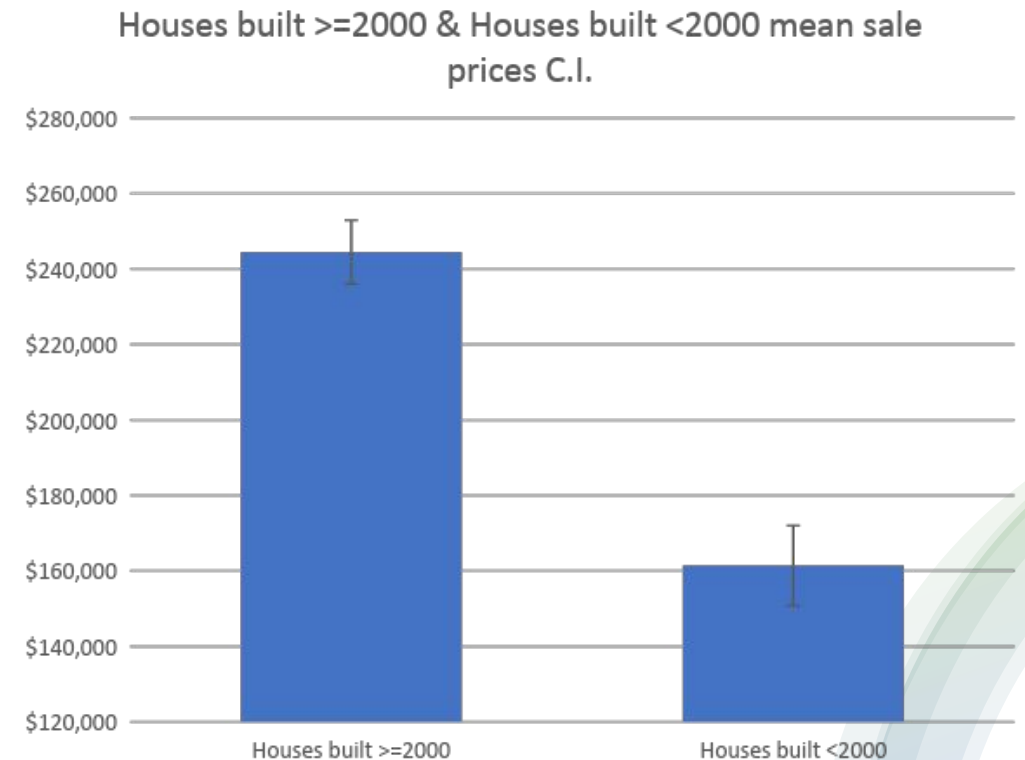
Results from H1

- The p-value of $8.07705E-17$ is less than the alpha of 0.05, which tells us there is a significant difference between the neighborhoods
- This leads to the rejection of the null hypothesis
- There is a 95% confidence the difference in means of sales price between the samples is between \$94,972 and \$141,638



Results from H2

- The p-value of 2.13975×10^{-27} is less than our alpha of 0.05, which tells us to reject the null hypothesis
- The mean of sale prices of the houses built and remodeled after 2000 is greater
- 95% confident the difference between the sample means is between \$-6,679.37 and \$20,476.38



Recommendations



Based on the results of the t-tests I would recommend investing in neighborhoods with high average sale prices and houses built after 1999



When planning investments neighborhood selection is an important factor



College Creek has a higher total sum, but Northridge Heights has a higher average



Even with a remodel, houses built after 2000 will be a more desirable choice to place investments