

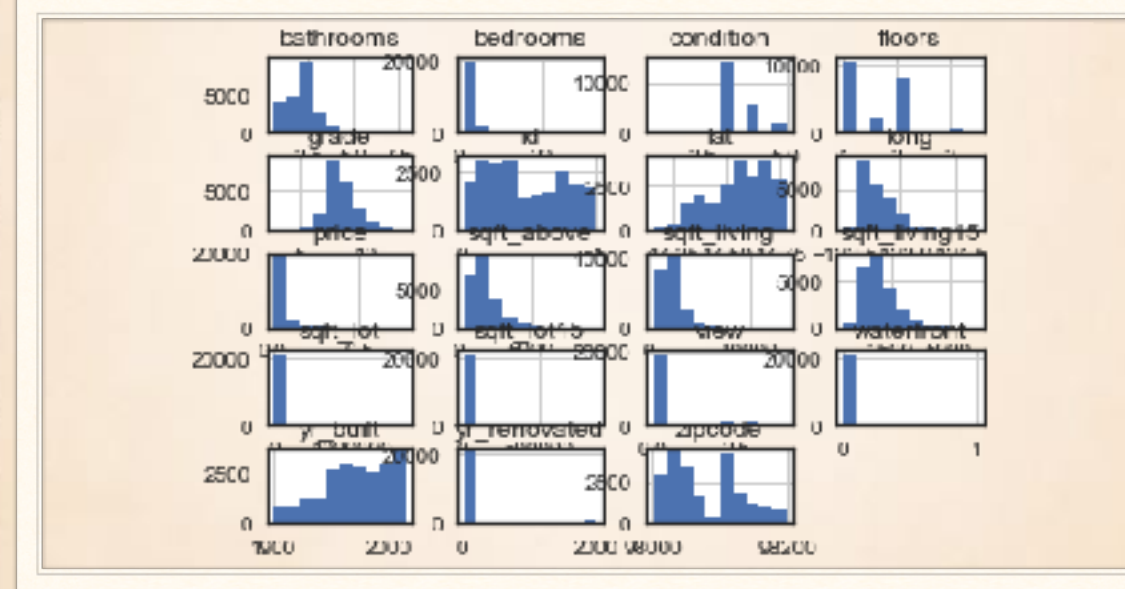
# KING COUNTY HOUSING ANALYSIS

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Today we will be looking at the King County, Washington housing data to determine how to best profit from housing sales, and what we should do to make the most of each sale.

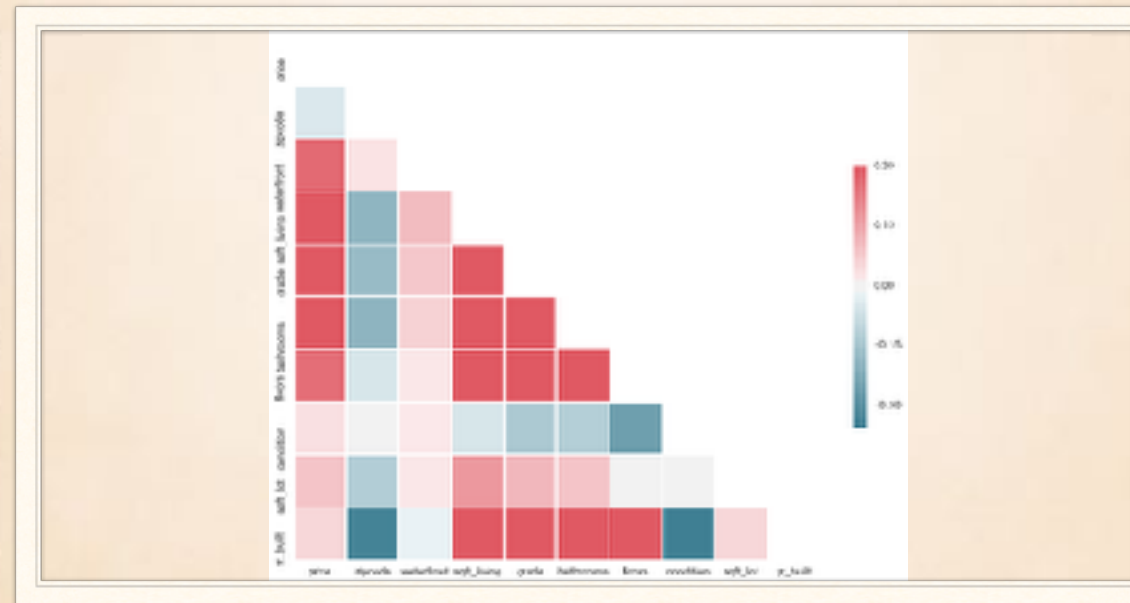
# PRELIMINARY DATA



Using histograms, we can see a visualization of each of the columns, or categories, which include number of bathrooms, number of bedrooms, latitude, longitude, and year built among others. From the shape of the bell curve and a bit more investigation we can see that some of the data are simple yes/no questions as in the instance of waterfront (whether the property is a waterfront or not).

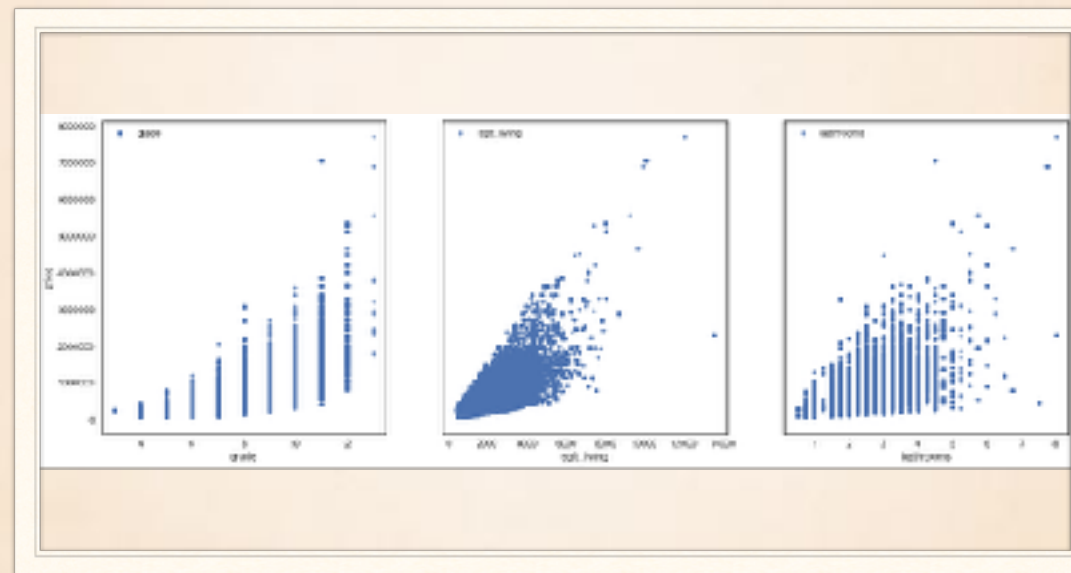
# CORRELATION HEAT MAP

## VISUALIZATION OF RELATIONSHIPS BETWEEN VARIABLES



To see how each data column correlates to the others, we use a heat map to view the relationships, if any. The bolder reds show positive correlations, while bolder blues show a negative correlation. As investors, we want to focus on which variables have relationships with price. If we look at the far left column, we can see that number of bathrooms, square feet of living space, and grade have the boldest red shade, meaning they have a positive relationship.

## CORRELATION BETWEEN PRICE AND OTHER VARIABLES

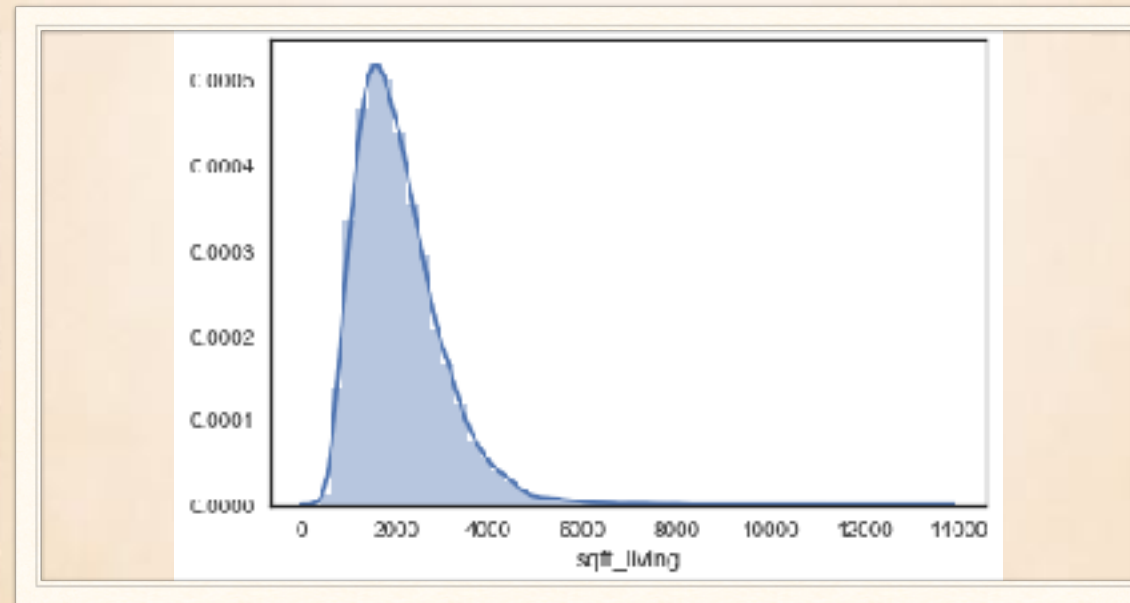


(L TO R: GRADE/PRICE, SQ FT LIVING SPACE/PRICE, NO OF BATHROOMS/PRICE)

Because they showed the greatest potential for influencing price we focused our analysis on grade, square feet of living space, and number of bathrooms per house. We create a scatter plot for each of these variables and their relationship with price. Ideally, we want to see a dense, narrow cone-shape, like our center plot (Square feet of living space and price). The wider the cone-shape, the more variation/outliers we have. From this we can see, that square feet of living space has the strongest correlation with price, which makes sense, as buyers want to pay more for a larger space. We also see a slight cone-shape in both of the other scatter plots, though they aren't as dense and have more outliers.

# BELL CURVE GRAPH

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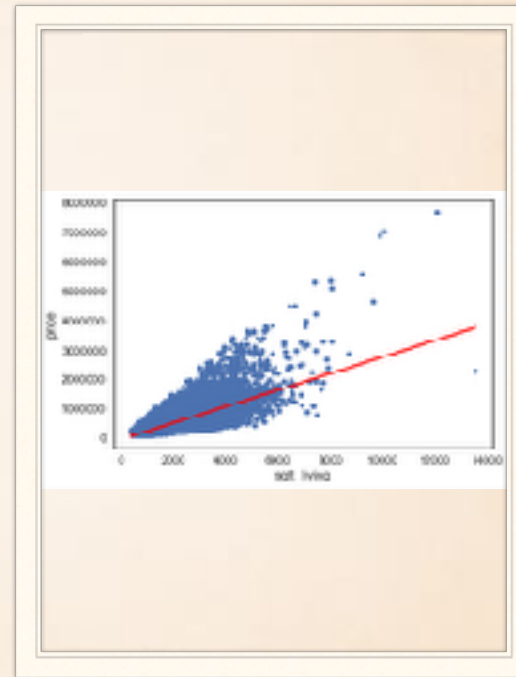


When transformed into a graph, we can see that the data is uniformly distributed. The single-peaked bell curve means that there is an even distribution of the data. The long tail includes all of the outlying houses (ex. extra-large mansions that deviate from the norm).



## RESULTS ANALYSIS

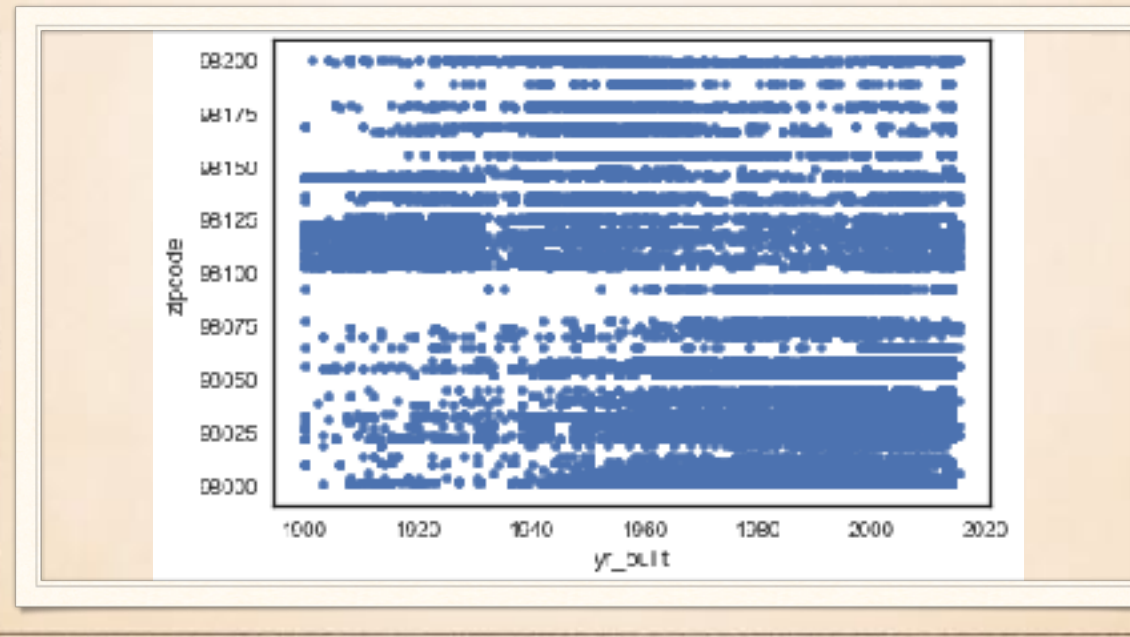
OF ALL THE VARIABLES  
PRESENTED, SQUARE FEET OF  
LIVING AREA IS THE BEST  
PREDICTOR OF SALE PRICE,  
FOLLOWED BY GRADE AND  
NUMBER OF BATHROOMS.



As a result the greatest indicator of a house's sale price is square feet of living space. Housing grade is second while number of bathroom is the third best indicator. This is logical as price per square foot is a long-time standard for setting the initial price, before such things as amenities are considered. Grade makes such an influence, as homebuyers must take into account not only the buying price of the house, but also the possible cost of repairs and renovations. As our culture becomes more individualized, increasing the number of bathrooms to equal the number of bedrooms also becomes a luxury cohabiting individuals will splurge for.

# SCATTER PLOT CORRELATION

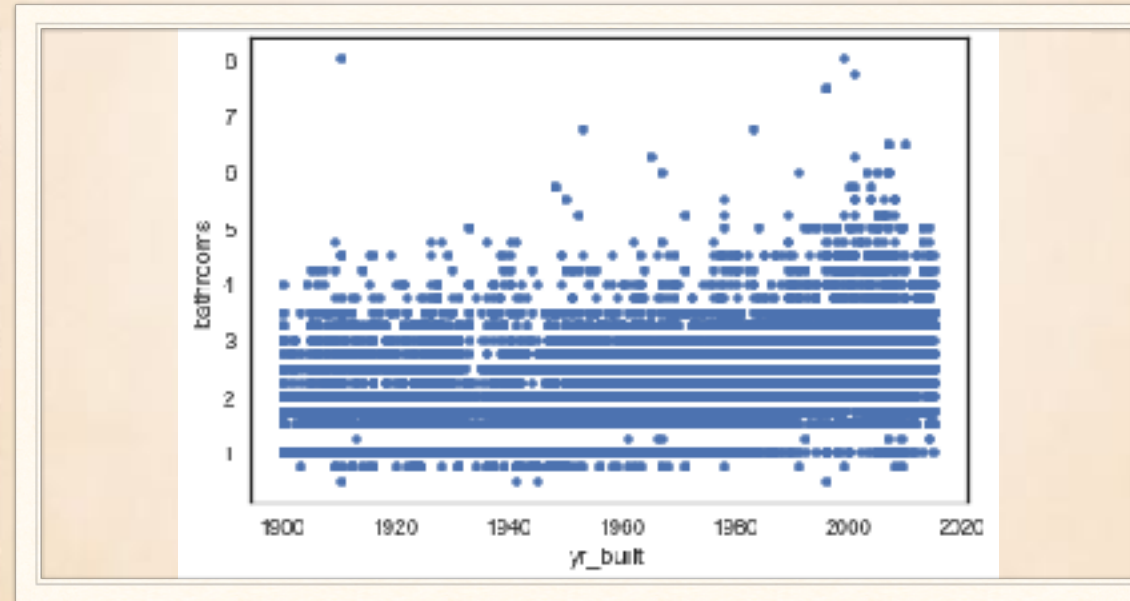
## ZIP CODE / YEAR BUILT



From the scatterplot above, we can see that since the 1900s development has grown across all zip codes. From the 1900s to the 1930s, the majority of the development was in zip codes 98100 to 98125. From the 1960s to the present day, the zip codes with the most growth were 98000 to 98050, though there was also a revitalization of the zip codes between 98100 and 98125.

# SCATTER PLOT CORRELATION

## NUMBER OF BATHROOMS / YEAR BUILT



From the scatter plot above we can see that as decades pass and technology changes, the number of bathrooms per house grows. In the 1900s we see that it was rare for a house to have more than four or five bathrooms and some houses only had what we would refer to as a half-bath. By the 1970s and 1980s, it became rare for a house to have less than one bathroom, and it was more common for a house to have between five and seven bathrooms (though the average remained approximately three bathrooms per house).



## IN SUMMARY

- ❖ Housing price is best correlated with square feet of living space.
- ❖ As available development plots within city limits decrease, developers must plan to capitalize on outlying areas.
- ❖ As social dynamics change, developers (and investors) can capitalize on the rise in individualism by building an equal number of bathrooms as bedrooms.

The best predictor of a house's sale price is its total square feet of living space. As the populations in cities continue to grow, developers will need to look to outlying neighborhoods for future capitalization. Adding a bathroom for each bedroom will also raise a house's sale price, especially in markets where non-related individuals dwell together.