

Assignment

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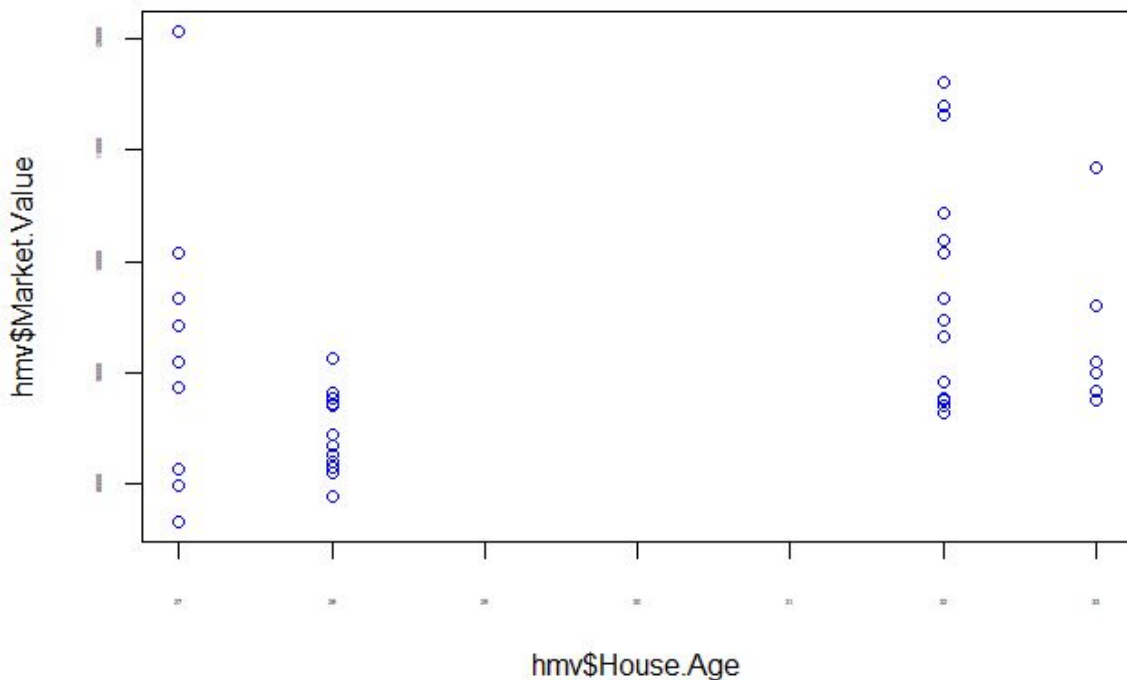
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Dataset – Home Market Value

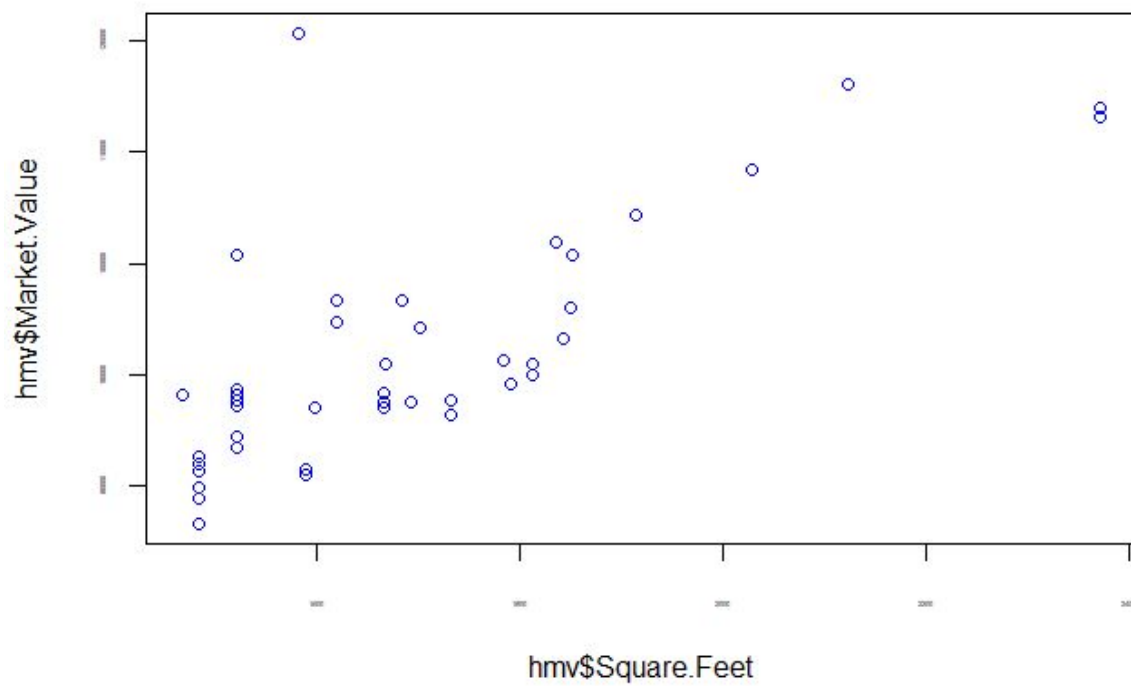
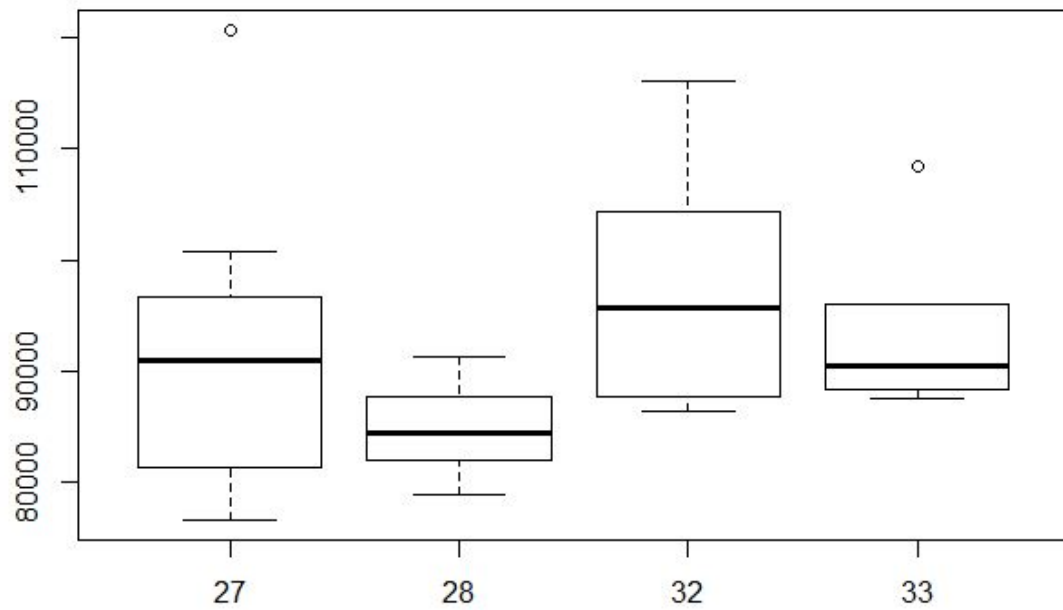
1. List 4 questions that you may want to explore
 - What is the relationship between age of a house, square feet and its market value?
 - Is there a relationship between square feet of a house and its market value
 - When age of a house is increased what happens to its market value?
 - What is the average market value of a house which age is 27 and the squarefeet over 1500?
 - Is there a relationship between age of a house and the square feet of the house.?
 - Does market value more depend on square feet or house age?

2. By analysing statistical properties of data (eg. mean, std, min, max, correlation etc.) and visualization what can claim about the dataset? Justify each of your claims.

```
> summary(hmv)
  House.Age      Square.Feet      Market.Value
Min.   :27.00   Min.   :1468   Min.    : 76600
1st Qu.:28.00   1st Qu.:1520   1st Qu.: 86575
Median :28.00   Median :1666   Median : 88500
Mean   :29.83   Mean   :1695   Mean    : 92069
3rd Qu.:32.00   3rd Qu.:1807   3rd Qu.: 96525
Max.   :33.00   Max.   :2372   Max.    :120700
```



This diagram does not show significant relationship between age of the house and market value.

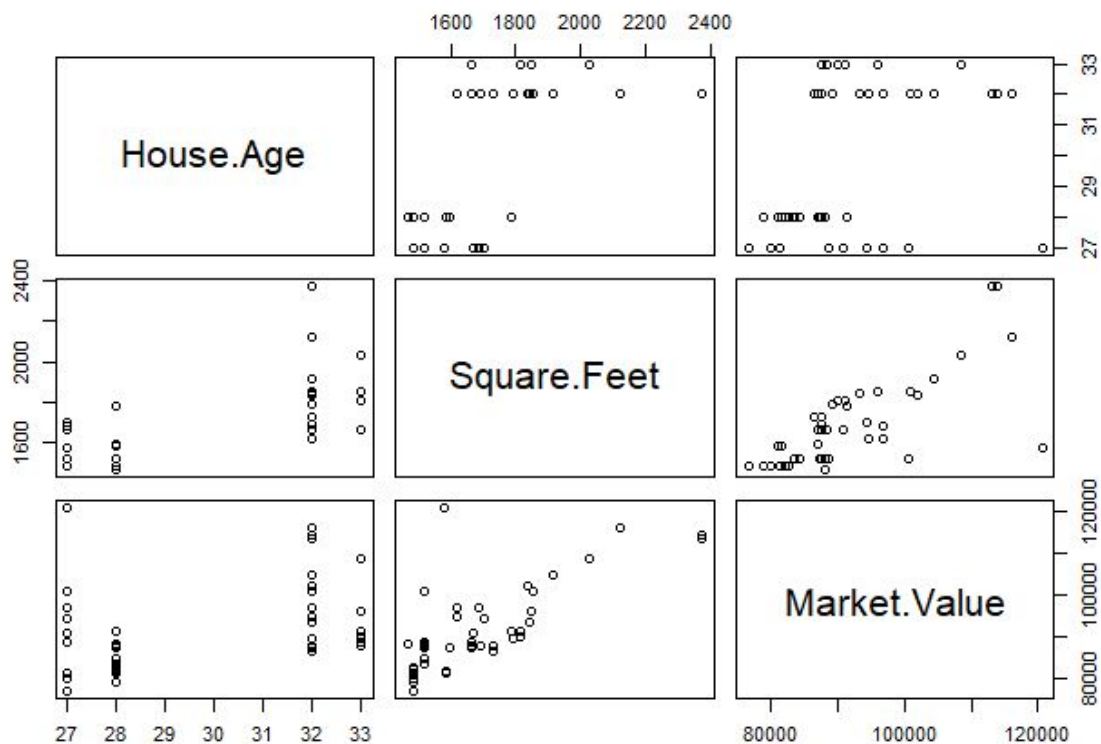


This diagram shows when square feet is high how market value is varies. According to this market value is increased when square feet is high.

Correlations

| | House.Age | Square.Feet | Market.Value |
|--------------|-----------|-------------|--------------|
| House.Age | 1.0000000 | 0.6456685 | 0.3614153 |
| Square.Feet | 0.6456685 | 1.0000000 | 0.7312552 |
| Market.Value | 0.3614153 | 0.7312552 | 1.0000000 |

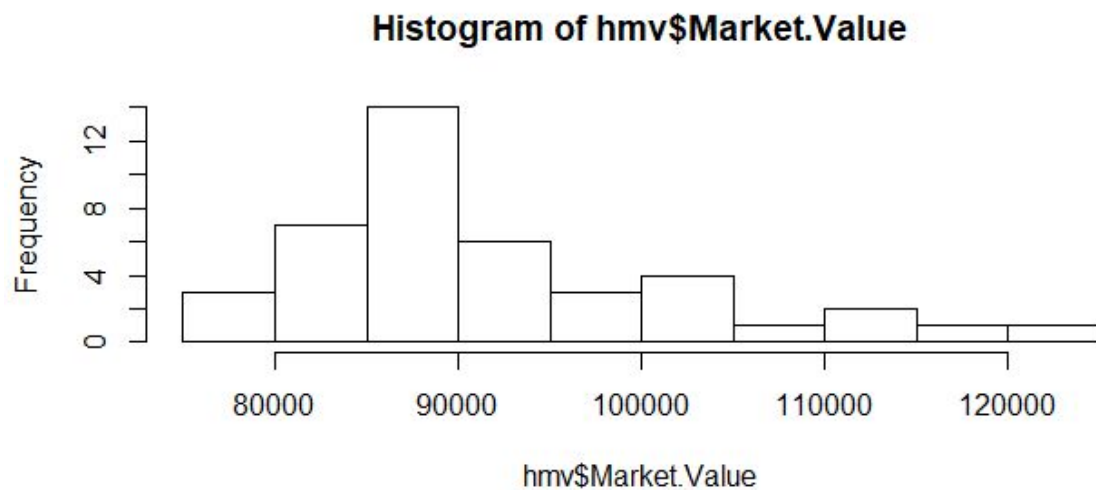
There's a notable correlation between Square feet of the house and the Market value. That means when there is high square feet value of the house, market value also getting increased. But house age and market value does not show significant correlation.



Average market value - \$92,069.05

Standard deviation of market value - \$10,553.08

There is no relationship between square feet and age of the house.



This shows how market value of houses varies.

3. What regression analysis technique is suitable to predict the market value, given the age of house and square feet? Justify.

Linear regression can be used if dependant variable is continuous and independent variables are discrete or continuous.

We can use multiple regression technique in order to predict the behavior of the house market value because there are two independent variables square feet and house age which market value depends on.

Multiple regression

Independent variables - House.Age , Square.feet

Dependent variable - Market.value

Call:

```
lm(formula = hmv$Market.Value ~ hmv$House.Age + hmv$Square.Feet)
```

Residuals:

| | | | | |
|-------|-------|--------|------|-------|
| Min | 1Q | Median | 3Q | Max |
| -9164 | -4220 | -2175 | 2487 | 30968 |

Coefficients:

| | Estimate | Std. Error | t value | Pr(> t) |
|------------------|-----------|------------|---------|--------------|
| (Intercept) | 47331.382 | 13884.347 | 3.409 | 0.00153 ** |
| hmv\$House.Age | -825.161 | 607.313 | -1.359 | 0.18205 |
| hmv\$Square.Feet | 40.911 | 6.697 | 6.109 | 3.65e-07 *** |

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Residual standard error: 7212 on 39 degrees of freedom

Multiple R-squared: 0.5558, Adjusted R-squared: 0.533

F-statistic: 24.4 on 2 and 39 DF, p-value: 1.344e-07

- Age of the house is correlated negatively with Market value. That means when age of the house increases market value of the house is decreased.
- Square feet field is positively correlated with the Market value as market value of the house is increased when its square feet number is high.
- Multiple R-squared: 0.5558

4. Predict the market value of the following 5 houses.

| Age | Square feet |
|-----|-------------|
| 26 | 1,650 |
| 28 | 1,500 |
| 29 | 1,800 |
| 30 | 2,200 |
| 31 | 2,400 |

Predicted value

| | fit | lwr | upr |
|----|-----------|-----------|-----------|
| 1. | 93380.45 | 88492.92 | 98267.99 |
| 2. | 85593.47 | 82520.73 | 88666.21 |
| 3. | 97041.63 | 93878.98 | 100204.28 |
| 4. | 112580.90 | 105506.93 | 119654.86 |
| 5. | 119937.95 | 110961.62 | 128914.27 |