Lab 10

Stat regression regression fit regression model

Response price

Predict tors age size

Graph 4 ion 1

Sdotrage fits residual

Fitted Eqn

Regression Equation

|  |  |  |
| --- | --- | --- |
| Market Price | = | 57.4 + 17.72 House Size - 0.666 House Age |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | 57.4 | 10.0 | 5.73 | 0.000 |  |
| House Size | 17.72 | 3.15 | 5.63 | 0.000 | 1.12 |
| House Age | -0.666 | 0.228 | -2.92 | 0.008 | 1.12 |

Conclusion:

1. Sample intercept is 57.4 with standard error of 10. |The sample intercept is significant (p-value=0.000)
2. Sample slope of market price of house on house size when controlling house age is 17.73 with standard error of 3.15. The slope is significant (p-value=0.000)
3. Sample slope of market price of house on house age is -0.666 with standard error of 0.228. The slope is significant (p-value=0.008)
4. Both house size and hous eage are significant and hence retained in the model, but house size is contributing largely on msrket price of house as comperd to house age(on observing slopes)

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 11.9604 | 74.11% | 71.52% | 65.49% |

Conclusionn:

1. THe adjusted coefficient of determination shows that 71.52% variation in market price of house is due to linear relationship of market pricec of house, size of house and age of house. Remaining 28.48% of variation in market price of house is due tofactors other thn hosue size and house price. Hence, the reliability of fitted eqn is high.
2. The standard error of estimate is 11.96

Reliability of whole model

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 2 | 8190 | 4094.9 | 28.63 | 0.000 |
| Error | 20 | 2861 | 143.1 |  |  |
| Total | 22 | 11051 |  |  |  |

Conclusion:

1. The anova tablwe shows that the whole model is significant (p-valoe=0.000)

Residual analysis



Conclusoin:

1. Normailty check of error distribtuoin: The histogram and normal probability plot shows that the error of distribution is not satsfactoreyily normal i.e it is right skewd. It may be due to small sample size.
2. Equal variance check: The second graph shows that the distribtuin of error about the reference line e=0 is almost same or equal which suggest homoscedasticity. Hence the assumption of equal variance is satisfactorily met, however thre are few extreme values in the graph.
3. Lineear relationship check: The second graph shows the distribution of dots has no obvious pattern(pattern is random),indicating linear relationship between house price, house size and house age.
4. ]Independece of reror check: The 4th graph show sthat error distribution showing random pattern, indicating independce of erros.