Linear regression: house pricing

<u>Life</u>



Linear regression: house pricing – Paper Example

Housing Prices in Blowing Rock, NC: A Hedonic Analysis Thomas Carter Economics 4000 1. Introduction A difficult characteristic to understand about the housing market is how a price is given for a particular house. That price will be designated to that particular house alone. All houses have various pricing, so I can't always assume that one will cost more or less than any other. The pricing for houses vary based on their characteristics. Each characteristic must be analyzed to determine its contribution or detraction toward the price.

I have taken some of these characteristics and modeled the relationship between them and the price of real estate for a specific area. How are these characteristics used in determining the price? A model that is commonly used in real estate appraisal is the hedonic regression. This method is specific to breaking down items that are not homogenous commodities, to estimate value of its characteristics and ultimately determine a price based on the consumers' willingness to pay. The approach in estimating the values is done by measuring the differences in the price of certain goods with regards to specific location.

E. g. average cost of real estate is much lower in Missouri than in California. Location may be the biggest factor in real estate pricing. 2. Data and Regression Analysis My data is for Blowing Rock, NC. It's a resort town in the Blue Ridge Mountains. The attractions here are mostlyoutdoor activitiestaking place in the secluded wilderness. The population is only about 1500 and the average cost of a house from my data is \$485, 839. 50. For my linear regression, I am modeling the relationship between the price of homes, being my dependent variable, and some characteristics of the omes, https://assignbuster.com/linear-regression-house-pricing-research-papersamples/

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being my explanatory variables. Originally my data consisted of the following for real estate in Blowing Rock, NC: price - selling price, miles from central business district, number of bedrooms, number of full bathrooms, number of half bathrooms, the year the home was built, square footage, number of garages, whether or not the house was located in a subdivision, lot size, if the house had a good view, number of days on the market, and difference between asking price and selling price. First I modeled a linear regression between price and all of my characteristics (see Table 1).

To interpret these variables I have regressed, I look at the Coefficient column of the output. The sign of the number tells whether the characteristic increases or decreases the price. For each additional mile away from the central business district the price of a home decreases \$25, 002. 96. For each additional bedroom the price increases \$20, 832. 78. For each additional full bathroom the price increases \$79, 715. 21. For each additional half bathroom the price increases \$123, 988. 80. For every year that a house ages the price decreases \$2, 355. 05. For every increase in one square-foot the price increases \$93. 13.

For each additional garage the price increases \$26, 249. 66. If the house is in a subdivision the price increases \$25, 999. 07. For each additional acre of land the price increases 56, 480. 75. If the home has a nice view(most likely of the Blue Ridge Mountains) the price increases 127, 900. 10. For each additional day the home is on the market the price decreases \$181. 04. Based on the adjusted R-squared I have determined that about 53. 38% of the price of homes in this town comes from these characteristics. Looking at the P values, not all are significant, thus some of these characteristics may play little part in determining the price.

The insignificant characteristics were number of bedrooms, number of garages, and whether or not the home was in a subdivision. Some other weak variables were the number of days the home has been on the market and the difference between asking price and selling price. I feel that the number of days the house a house is on the market is a weak explanatory variable because a seller usually has an idea of what the house is worth, and even if it does not sell immediately, they may be willing to wait or only need to adjust the price a little in order for it to sell.

The difference in asking and selling price could be correlated with the number of days on the market and very similar reasoning as to why it is a weak variable. The seller will most likely not allow much difference in their asking and selling price because of the appraised value. Also, looking at the coefficients of these two variables, I can see that change in them do not impact the price very much. The number of bedrooms is not a significant characteristic because it is correlated with the square footage. It seems a little odd that the number of garages is insignificant.

However, the mean number of garages for this data is above one, meaning the average house in Blowing Rock has at least one garage. With a garage being fairly standard amenity for homes in Blowing Rock I can understand it not being a very significant factor on the price compared to the other characteristics. Living in a subdivision is not significant for this town as well. I took out the highly insignificant variables (bedrooms, garages, and subdivision) and modeled another regression (see Table 2). My adjusted R-squared improved to 54. 28%. Expand! 3. Summary and Conclusions

| Table 1 reg price miles bedrooms fullbath halfbath yearbuilt sqft garage sub | | | | | | | |
|--|--|--|--|--|--|--|--|
| acres vie > ws days diff Source SS df MS Number of obs = 100 | | | | | | | |
| + F(12, 87) = 10. 45 Model 6. 0522e+12 12 5. | | | | | | | |
| 0435e+11 Prob > F = 0. 0000 Residual 4. 2002e+12 87 4. 8278e+10 R- | | | | | | | |
| squared = 0. 5903++ Adj R-squared = 0. 5338 | | | | | | | |
| Total 1. 0252e+13 99 1. 0356e+11 Root MSE = 2. 2e+05 | | | | | | | |
| price Coef. Std. Err. | | | | | | | |
| t P> t [95% Conf. Interval] | | | | | | | |
| + miles -25002. 96 9499. | | | | | | | |
| 989 -2. 63 0. 010 -43885. 22 -6120. 706 bedrooms 20832. 78 44293. 87 0. | | | | | | | |
| 47 0. 639 -67206. 08 108871. 6 fullbath 79715. 21 40491. 55 1. 97 0. 052 - | | | | | | | |
| 766. 1288 160196. 5 halfbath 123988. 8 45920. 12 2. 70 0. 008 32717. 59 | | | | | | | |
| 215260 yearbuilt -2355. 046 1202. 24 -1. 96 0. 053 -4744. 596 34. 50387 | | | | | | | |
| sqft 93. 13114 50. 65843 1. 84 0. 069 -7. 557963 193. 8203 garage | | | | | | | |
| 26249. 66 28224. 21 0. 93 0. 355 -29849. 02 82348. 34 sub 25999. 07 | | | | | | | |
| 56280. 61 0. 46 0. 645 -85864. 75 137862. 9 acres 56480. 75 13324. 99 4. | | | | | | | |
| 24 0. 000 29995. 88 82965. 61 views 127900. 1 48592. 63 2. 63 0. 010 | | | | | | | |
| 31316. 96 224483. 2 days -181. 0406 126. 8538 -1. 43 0. 157 -433. 1762 | | | | | | | |
| 71. 09506 diff . 5086182 . 3190536 1. 59 0. 15 1255353 1. 142772 _cons | | | | | | | |
| 4541470 2363007 1. 92 0. 058 -155261. 1 9238202 Table 2 reg price | | | | | | | |
| fullbath halfbath yearbuilt sqft acres views days diff miles Source SS df MS | | | | | | | |
| Number of obs = 100 ++ F(9, 90) = 14. 06 | | | | | | | |
| Model 5. 9915e+12 9 6. 6572e+11 Prob > F = 0. 0000 Residual 4. | | | | | | | |

| 2609e+12 | 90 4 | . 7344e | +10 R-sq | uared = | 0. 5 | 844 | |
|---|----------|--------------|---------------|-------------------------|-----------|-----------------|--|
| + | | Adj R- | squared = | 0. 5428 To | otal 1. | 252e+13 99 1. | |
| 0356e+11 | l | Root | MSE | = | 2. | 2e+05 | |
| | | | | | price | Coef. Std. Err. | |
| t P> | t | [95 | 5% Co | onf. I | Interval] | | |
| + | | | | fullb | ath 84 | 256. 29 38750. | |
| 63 2. 17 0. 032 7271. 402 161241. 2 halfbath 131657. 9 43504. 03 3. 03 0. | | | | | | | |
| 003 45229. | 58 2180 |)86. 3 yea | arbuilt -22 | 86. 429 11 | L65. 349 | -1.960.053- | |
| 4601. 599 2 | 8. 74033 | 8 sqft 112 | 2. 8896 40. | 74526 2. 7 ⁻ | 7 0. 007 | | |