MTH 325, Quiz #6, Spring 2024 Name KEY

Instructions: Answer each question as thoroughly as possible. Round answers to 4 decimal places as needed. Exact answers are best when possible. Be sure to answer all parts of each question.

1. Consider the data on home prices in **325quiz6data.xlsx**. Perform a square root transformation to both variables and add them to the dataset. Then use best subset selection methods to find the best model to predict price from the other variables (excluding Home). Perform appropriate diagnostics and do the following:
   a. State your final equation (clearly state which variable is which)

   $\hat{Price} = 9253.9\,Bathrooms + 3294.9\,\sqrt{Home\ Size} + 30743.4\,\sqrt{Lot\ Size}$

   b. Conduct appropriate hypothesis tests on your final model for all coefficients.

   all coeff have p-values less than 0.05

   c. Create residual plots and analyze them to test your assumptions for the multivariable model.

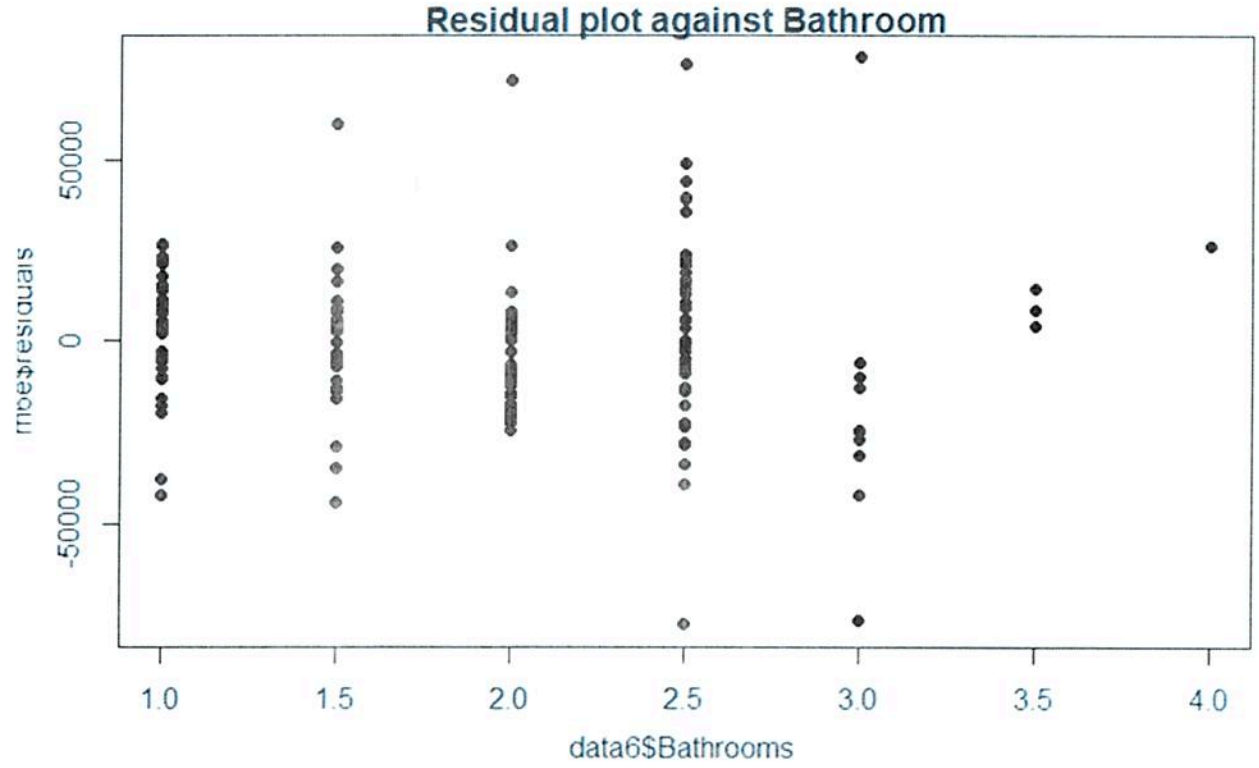
   they seem okay.

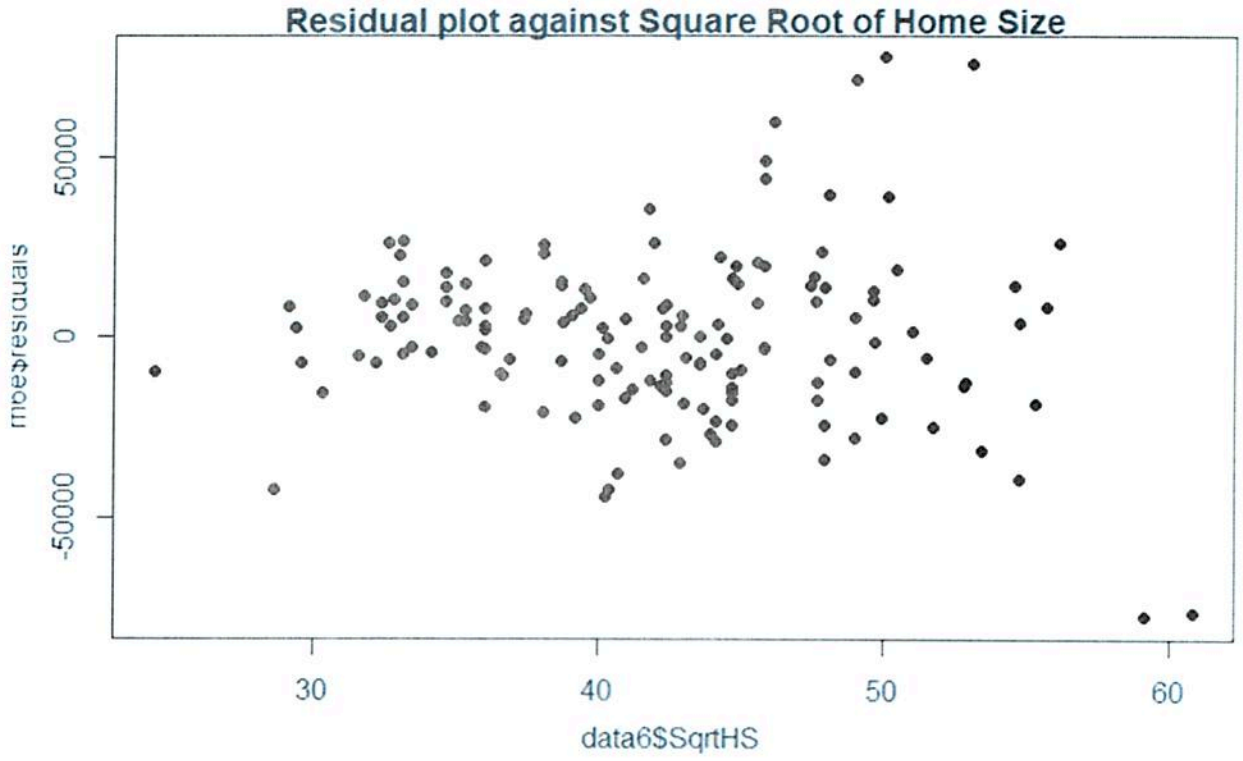
   d. What is the final R^2 of the model? What does it mean in context?

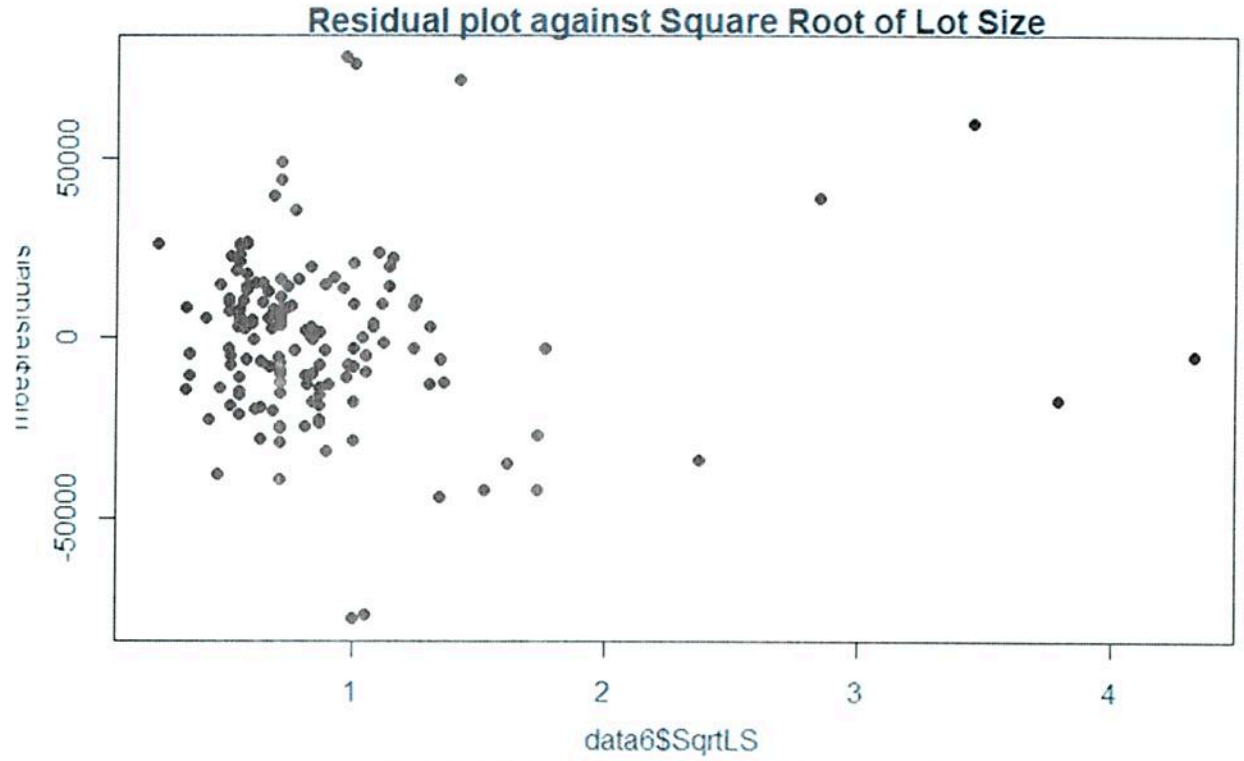
   98.51% 98.5% of the variability in price can be explained by the relationship w/ Bathrooms, $\sqrt{Home\ Size}$ and $\sqrt{Lot\ Size}$

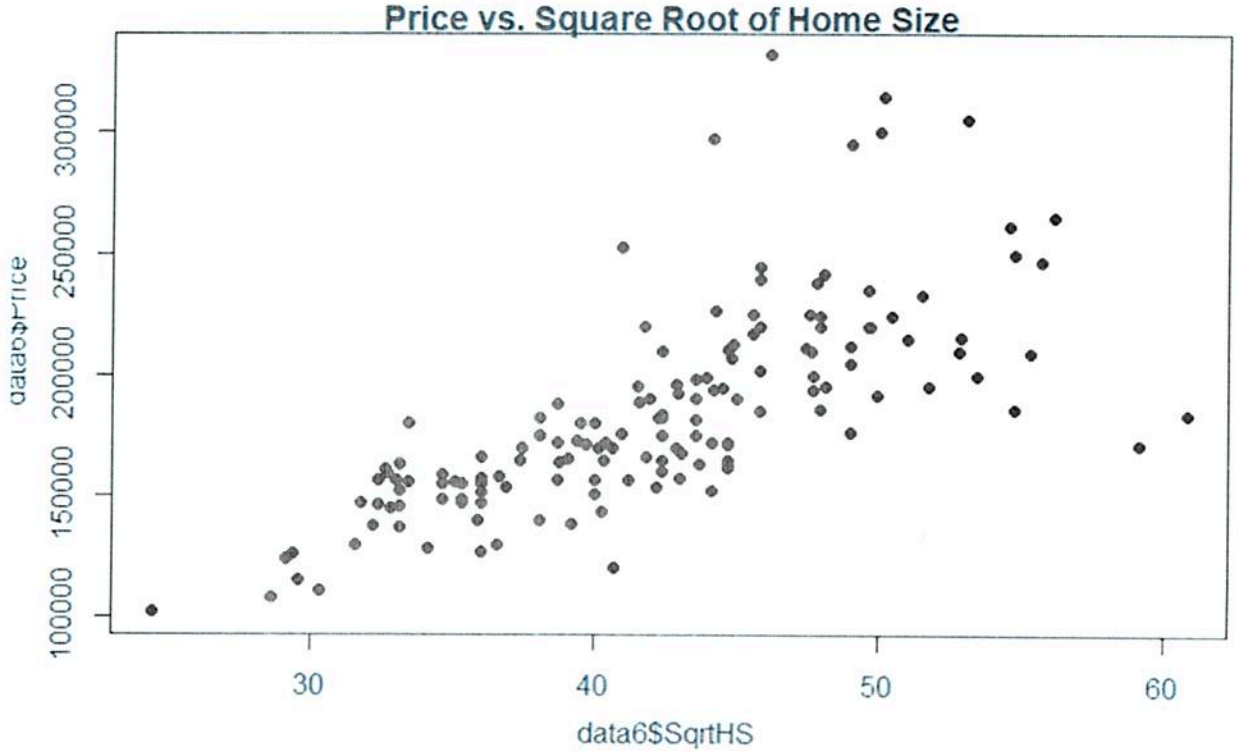
   e. Create a scatter plot of the transformed variables relative to the price, and the untransformed variables relative to the price. Does the transformation appeared to have improved the linearity? Explain.

   Lot Size has many outliers, the transformation seems to help the data appear less vertical. The Home Size variable appears to show some marginal improvement but not that much.

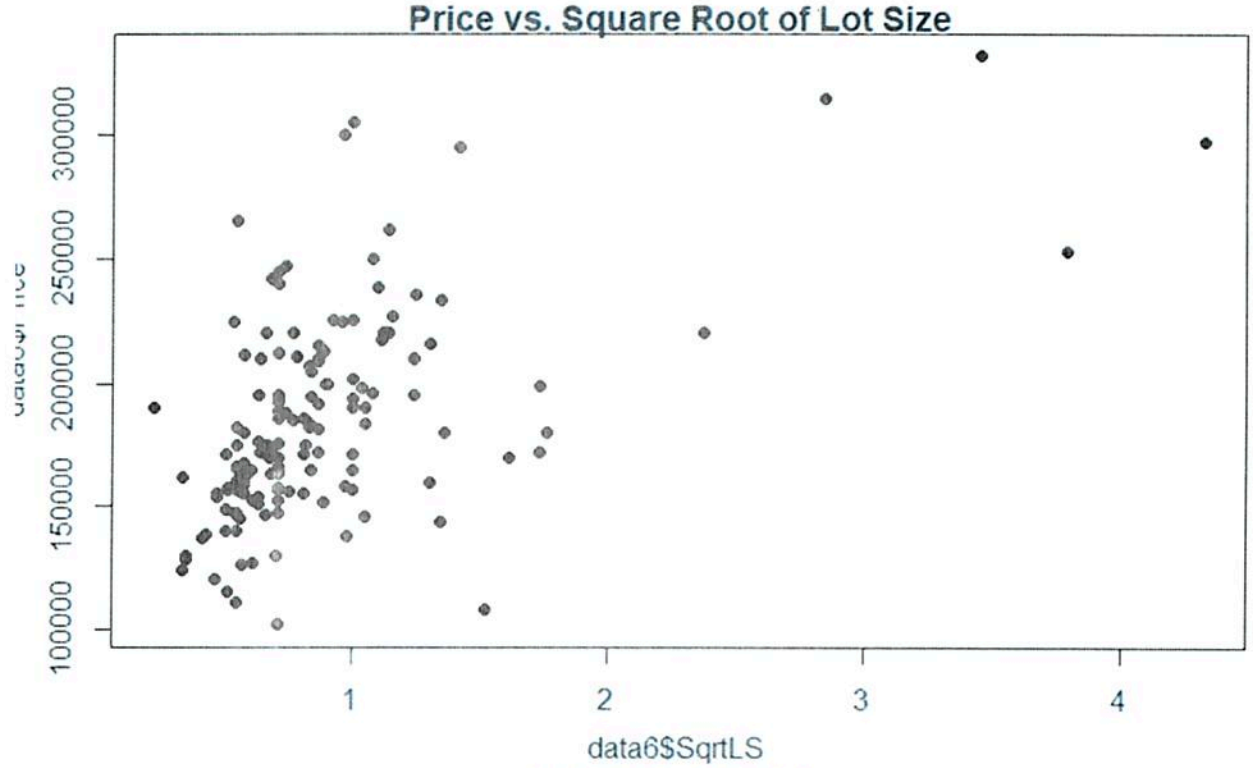

Residual plot against Bathroom
mbe$residuals
50000
0
-50000
1.0
1.5
2.0
2.5
3.0
3.5
4.0
data6$Bathrooms

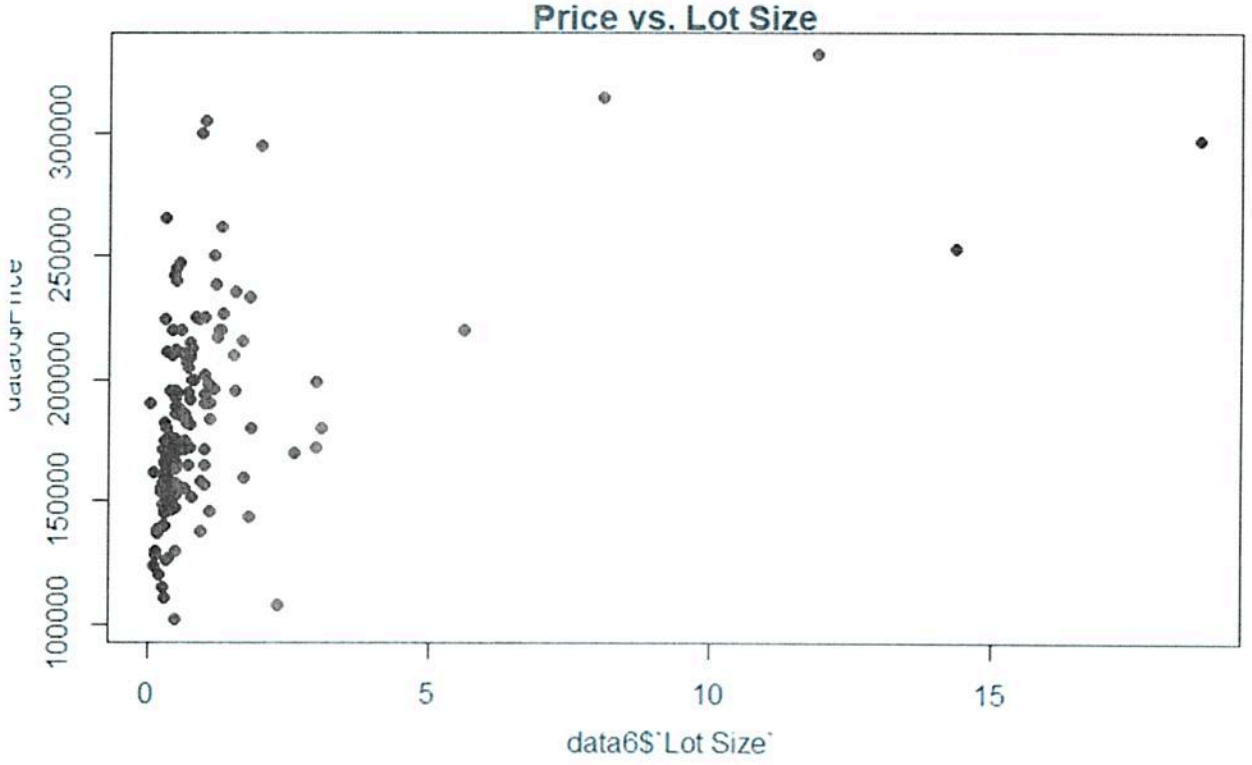

Residual plot against Square Root of Home Size
mbe$residuals
50000
0
-50000
30
40
50
60
data6$SqrtHS


Residual plot against Square Root of Lot Size
50000
0
-50000
1
2
3
4
data6$SqrtLS


Price vs. Square Root of Home Size
100000
150000
200000
250000
300000
30
40
50
60
data6$SqrtHS


Price vs. Home Size
100000
150000
200000
250000
300000
500
1000
1500
2000
2500
3000
3500
data6$`Home Size`


Price vs. Square Root of Lot Size
100000
150000
200000
250000
300000
1
2
3
4
data6$SqrtLS


Price vs. Lot Size
100000
150000
200000
250000
300000
0
5
10
15
data6$`Lot Size`