Practice Questions for STA371G, Spring 2017

Quiz 1. Consider the model:
MPGfit= lm(mpg~weight+horsepower+displacement+acceleration+cylinders)

Coefficients:

| | Estimate | Std. Error | t value | Pr(>\|t\|) |
|---|---|---|---|---|
| (Intercept) | 4.626e+01 | 2.669e+00 | 17.331 | <2e-16 *** |
| weight | -5.187e-03 | 8.167e-04 | -6.351 | 6e-10 *** |
| horsepower | -4.526e-02 | 1.666e-02 | -2.716 | 0.0069 ** |
| displacement | -8.313e-05 | 9.072e-03 | -0.009 | 0.9927 |
| acceleration | -2.910e-02 | 1.258e-01 | -0.231 | 0.8171 |
| cylinders | -3.979e-01 | 4.105e-01 | -0.969 | 0.3330 |

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Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 4.247 on 386 degrees of freedom
Multiple R-squared: 0.7077, Adjusted R-squared: 0.7039
F-statistic: 186.9 on 5 and 386 DF, p-value: < 2.2e-16

1. Explain the relationship between MPG and Horsepower
2. Should we reject the Null Hypothesis that \beta_1 = \beta_2 =...\beta_5 = 0?
3. Provide a suggestion to reduce the standard error of the regression coefficient for Horsepower

Quiz 2. Consider the model:
MidCity = lm(Price~dn2+dn3+SqFt+Brick+Bedrooms+Bathrooms)

Coefficients:

| | Estimate | Std. Error | t value | Pr(>\|t\|) |
|---|---|---|---|---|
| (Intercept) | 17919.446 | 10474.046 | 1.711 | 0.08967 . |
| dn2TRUE | 4865.694 | 2721.805 | 1.788 | 0.07633 . |
| dn3TRUE | 34083.719 | 3168.987 | 10.755 | < 2e-16 *** |
| SqFt | 35.930 | 6.404 | 5.610 | 1.30e-07 *** |
| BrickYes | 18507.779 | 2396.302 | 7.723 | 3.65e-12 *** |
| Bedrooms | 1902.169 | 1902.270 | 1.000 | 0.31933 |
| Bathrooms | 6826.925 | 2562.812 | 2.664 | 0.00878 ** |

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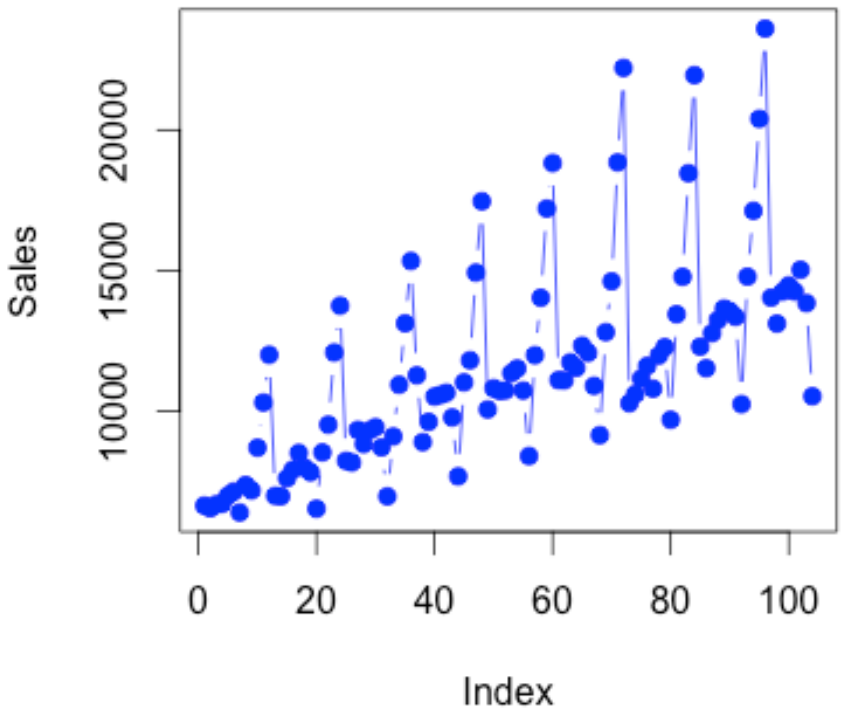
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12150 on 121 degrees of freedom
Multiple R-squared: 0.805, Adjusted R-squared: 0.7954
F-statistic: 83.27 on 6 and 121 DF, p-value: < 2.2e-16

1 Is there sufficient evidence to conclude that Brick Houses are sold at a premium?
2 Why not include "dn1" into the regression model?
3 Explain the relationship between "Price" and "SqFt".
4 Why not include "offers" into the regression model?

Quiz 3. Describe the time series for monthly red wine sales:




1. What kind of patterns could you observe from this time series?

2. If you forecast future wine sales based on this time series, what would be your underlying assumption?

3. Propose a model that can be used to describe the data and forecast future wine sales.