

**BA360 Advanced Statistics**  
Midterm - *Practice Exam*  
Oct 6, 2020

Name: \_\_\_\_\_

1.1 Write the  $\hat{y}$  equation for your best Pueblo Real Estate model from Lesson 10. Define your interaction variable (how to calculate) and dummy variables (which neighborhoods).

1.2. Write the  $R^2$  and F-Statistic values for this model.

1.3. Use the model in 1.1 to estimate Selling Price for the 2 properties listed below.

ID	Address	Neighborhood	Beds	Baths	SqFt	Selling Price
1	901 W 27th	Northside/Avenues	4	2	2,078	
2	805 Westacres	Sunset Park	3	2	1,618	

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2.1. Write the  $\hat{y}$  equation for your best 2013 MLB (baseball) model from Lesson 8.

2.2. Write the t-statistic and p-value for each variable included in your model.

2.3. Use the model in 2.1 to estimate Win % for the 2 teams with the following statistics.

ID	ERA	RBI	Slug	Slug BI	WS Mgr	BB	Payroll	Win %
1	4.44	673	0.418	281	0	427	\$75,449,071	
2	3.61	767	0.434	333	1	531	\$149,046,84	

3.1. Evaluate Model 1 and Model 2 below. What are the advantages of Model 1 vs 2 and vice-versa? Write 1-2 paragraphs comparing the two models. Reference appropriate statistics from the model output to support your arguments.

Multiple R	0.9498								<b>MODEL 1</b>
R Square	0.9022								
Adjusted R	0.9014								
Standard Error	3,103.20								
Observations	804								
<b>ANOVA</b>	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig F</i>				
Regression	6	7.08E+10	1.18E+10	1,225.1	0.0000				
Residual	797	7.67E+09	9.63E+06						
Total	803	7.85E+10							
	<i>Coefficients</i>	<i>Std. Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Low 95%</i>	<i>Up 95%</i>	<i>Low 95%</i>	<i>Up 95%</i>	
Intercept	-4,755.49	854.22	-5.5671	0.0000	-6,432.27	-3,078.72	-6,432.27	-3,078.72	
Doors	-1,134.96	138.50	-8.1948	0.0000	-1,406.82	-863.10	-1,406.82	-863.10	
Options	388.57	146.35	2.6551	0.0081	101.30	675.84	101.30	675.84	
Engine Combo	340.16	10.67	31.8806	0.0000	319.22	361.11	319.22	361.11	
Make Index	731.26	16.20	45.1278	0.0000	699.45	763.07	699.45	763.07	
Type Index	523.83	22.59	23.1871	0.0000	479.48	568.17	479.48	568.17	
Mileage	-0.17	0.01	-13.0667	0.0000	-0.20	-0.15	-0.20	-0.15	

Multiple R	0.9446								<b>MODEL 2</b>
R Square	0.8922								
Adjusted R	0.8917								
Standard Error	3,252.9								
Observations	804								
<b>ANOVA</b>	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Sig F</i>				
Regression	4	7.00E+10	1.75E+10	1,654.0	0.0000				
Residual	799	8.45E+09	1.06E+07						
Total	803	7.85E+10							
	<i>Coefficients</i>	<i>Std Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Low 95%</i>	<i>Up 95%</i>	<i>Low 95%</i>	<i>Up 95%</i>	
Intercept	-8,881.83	565.8563	-15.70	0.0000	-9,992.57	-7,771.09	-9,992.57	-7,771.09	
Engine Combo	355.80	10.9896	32.38	0.0000	334.23	377.37	334.23	377.37	
Make Index	705.97	16.1905	43.60	0.0000	674.19	737.75	674.19	737.75	
Type Index	580.36	22.4316	25.87	0.0000	536.33	624.39	536.33	624.39	
Mileage	-0.17	0.0140	-12.39	0.0000	-0.20	-0.15	-0.20	-0.15	