Model with Heating Quality and Season as Interacting Predictors

The GLM Procedure

Class Level Information		
Class	**Levels**	**Values**
Season_Sold	4	1 2 3 4
Heating_QC	4	Ex Fa Gd TA

Number of Observations Read	300
Number of Observations Used	300

Model with Heating Quality and Season as Interacting Predictors

The GLM Procedure

Dependent Variable: SalePrice Sale price in dollars

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	97609874155	6507324943.7	5.68	<.0001
Error	284	325613645356	1146526920.3		
Corrected Total	299	423223519511			

R-Square	Coeff Var	Root MSE	SalePrice Mean
0.230634	24.62130	33860.40	137524.9

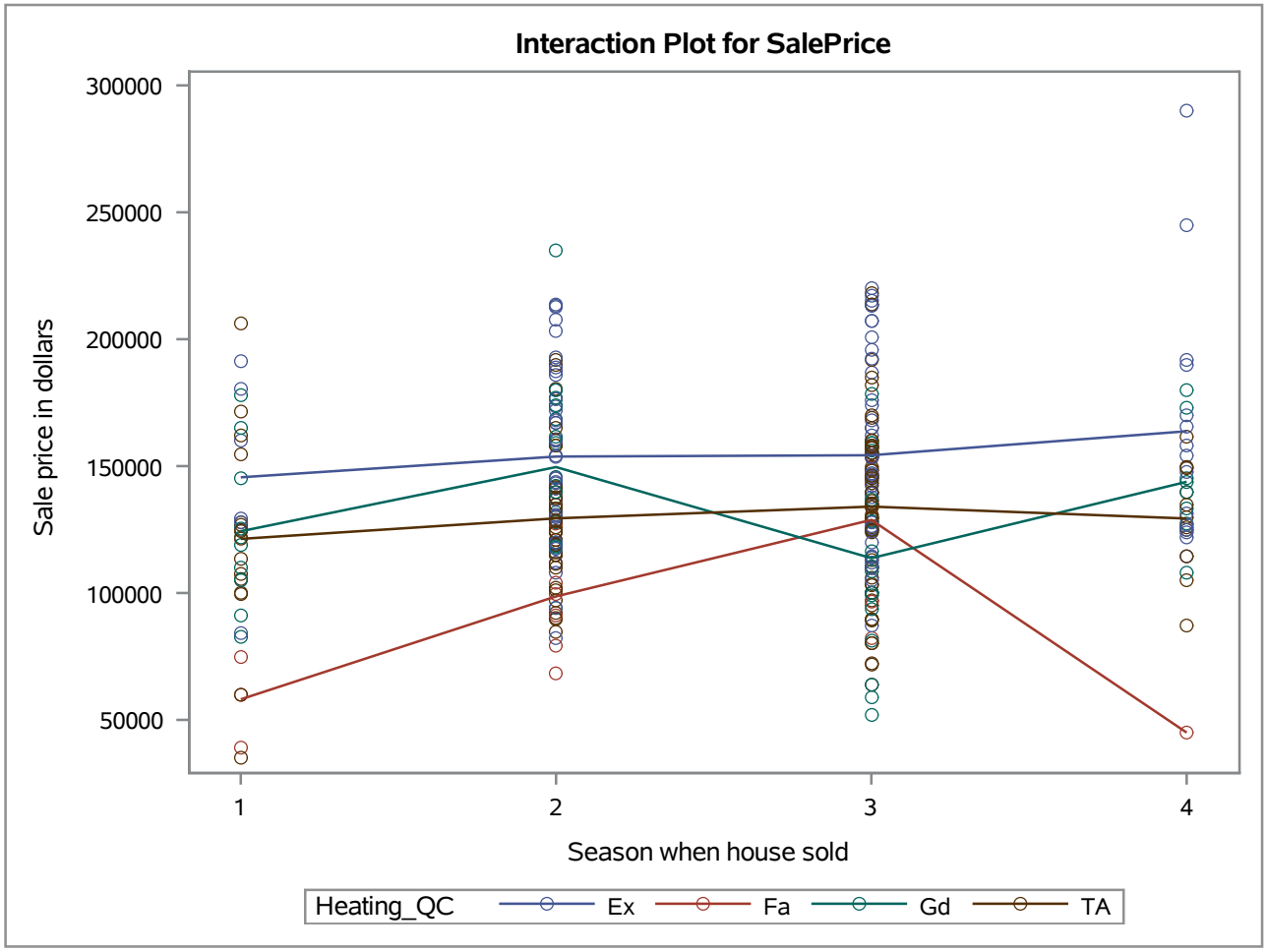
Source	DF	Type I SS	Mean Square	F Value	Pr > F
Heating_QC	3	66835556221	22278518740	19.43	<.0001
Season_Sold	3	5939259845	1979753282	1.73	0.1617
Season_So*Heating_QC	9	24835058089	2759450899	2.41	0.0121

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Heating_QC	3	51116493768	17038831256	14.86	<.0001
Season_Sold	3	9318181844	3106060615	2.71	0.0455
Season_So*Heating_QC	9	24835058089	2759450899	2.41	0.0121

Model with Heating Quality and Season as Interacting Predictors

The GLM Procedure

Dependent Variable: SalePrice Sale price in dollars



Model with Heating Quality and Season as Interacting Predictors

The GLM Procedure
Least Squares Means

Season_Sold	Heating_QC	SalePrice LSMEAN	LSMEAN Number
1	Ex	145583.333	1
1	Fa	58100.000	2
1	Gd	124330.000	3
1	TA	121312.500	4
2	Ex	153765.244	5
2	Fa	98657.143	6
2	Gd	149619.833	7
2	TA	129404.412	8
3	Ex	154279.422	9
3	Fa	128800.000	10
3	Gd	113727.273	11
3	TA	134046.552	12
4	Ex	163726.933	13
4	Fa	45000.000	14
4	Gd	143812.500	15
4	TA	129345.455	16

Least Squares Means for effect Season_So*Heating_QC
Pr > |t| for H0: LSMean(i)=LSMean(j)

Dependent Variable: SalePrice

i/j	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1		0.0003	0.2252	0.1354	0.5808	0.0133	0.8005	0.2815	0.5550	0.4137	0.0420	0.4276	0.2682	0.0063	0.9229	0.3455
2	0.0003		0.0032	0.0033	<.0001	0.0837	<.0001	0.0005	<.0001	0.0046	0.0080	0.0002	<.0001	0.7378	0.0002	0.0014
3	0.2252	0.0032		0.8252	0.0143	0.1250	0.0593	0.6773	0.0119	0.8097	0.4123	0.4027	0.0047	0.0263	0.2261	0.7349
4	0.1354	0.0033	0.8252		0.0013	0.1409	0.0156	0.4312	0.0009	0.6664	0.4959	0.1840	0.0006	0.0296	0.1260	0.5452
5	0.5808	<.0001	0.0143	0.0013		<.0001	0.6654	0.0021	0.9440	0.1207	<.0001	0.0046	0.3304	0.0017	0.4476	0.0345
6	0.0133	0.0837	0.1250	0.1409	<.0001		0.0008	0.0295	<.0001	0.1295	0.3059	0.0095	<.0001	0.1394	0.0105	0.0619
7	0.8005	<.0001	0.0593	0.0156	0.6654	0.0008		0.0415	0.6221	0.2249	0.0010	0.0894	0.2344	0.0029	0.6868	0.1188
8	0.2815	0.0005	0.6773	0.4312	0.0021	0.0295	0.0415		0.0014	0.9703	0.0917	0.5261	0.0012	0.0146	0.2798	0.9960
9	0.5550	<.0001	0.0119	0.0009	0.9440	<.0001	0.6221	0.0014		0.1115	<.0001	0.0029	0.3502	0.0016	0.4211	0.0294
10	0.4137	0.0046	0.8097	0.6664	0.1207	0.1295	0.2249	0.9703	0.1115		0.3697	0.7398	0.0467	0.0246	0.4374	0.9762
11	0.0420	0.0080	0.4123	0.4959	<.0001	0.3059	0.0010	0.0917	<.0001	0.3697		0.0172	<.0001	0.0481	0.0322	0.2127
12	0.4276	0.0002	0.4027	0.1840	0.0046	0.0095	0.0894	0.5261	0.0029	0.7398	0.0172		0.0027	0.0096	0.4451	0.6732
13	0.2682	<.0001	0.0047	0.0006	0.3304	<.0001	0.2344	0.0012	0.3502	0.0467	<.0001	0.0027		0.0008	0.1802	0.0110
14	0.0063	0.7378	0.0263	0.0296	0.0017	0.1394	0.0029	0.0146	0.0016	0.0246	0.0481	0.0096	0.0008		0.0063	0.0177

Model with Heating Quality and Season as Interacting Predictors

The GLM Procedure
Least Squares Means

Least Squares Means for effect Season_So*Heating_QC
Pr > |t| for H0: LSMean(i)=LSMean(j)

Dependent Variable: SalePrice

i/j	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
15	0.9229	0.0002	0.2261	0.1260	0.4476	0.0105	0.6868	0.2798	0.4211	0.4374	0.0322	0.4451	0.1802	0.0063		0.3586
16	0.3455	0.0014	0.7349	0.5452	0.0345	0.0619	0.1188	0.9960	0.0294	0.9762	0.2127	0.6732	0.0110	0.0177	0.3586	

Model with Heating Quality and Season as Interacting Predictors

The GLM Procedure
Least Squares Means

Season_So*Heating_QC Effect Sliced by Heating_QC for SalePrice					
Heating_QC	DF	Sum of Squares	Mean Square	F Value	Pr > F
Ex	3	1759608339	586536113	0.51	0.6746
Fa	3	12318827232	4106275744	3.58	0.0143
Gd	3	14560964166	4853654722	4.23	0.0060
TA	3	2134918196	711639399	0.62	0.6021

Note: To ensure overall protection level, only probabilities associated with pre-planned comparisons should be used.

Model with Heating Quality and Season as Interacting Predictors

The PLM Procedure

Store Information	
Item Store	WORK.INTERACT
Data Set Created From	STAT1.AMESHOUSING3
Created By	PROC GLM
Date Created	10DEC25:12:25:04
Response Variable	SalePrice
Class Variables	Season_Sold Heating_QC
Model Effects	Intercept Heating_QC Season_Sold Season_So*Heating_QC

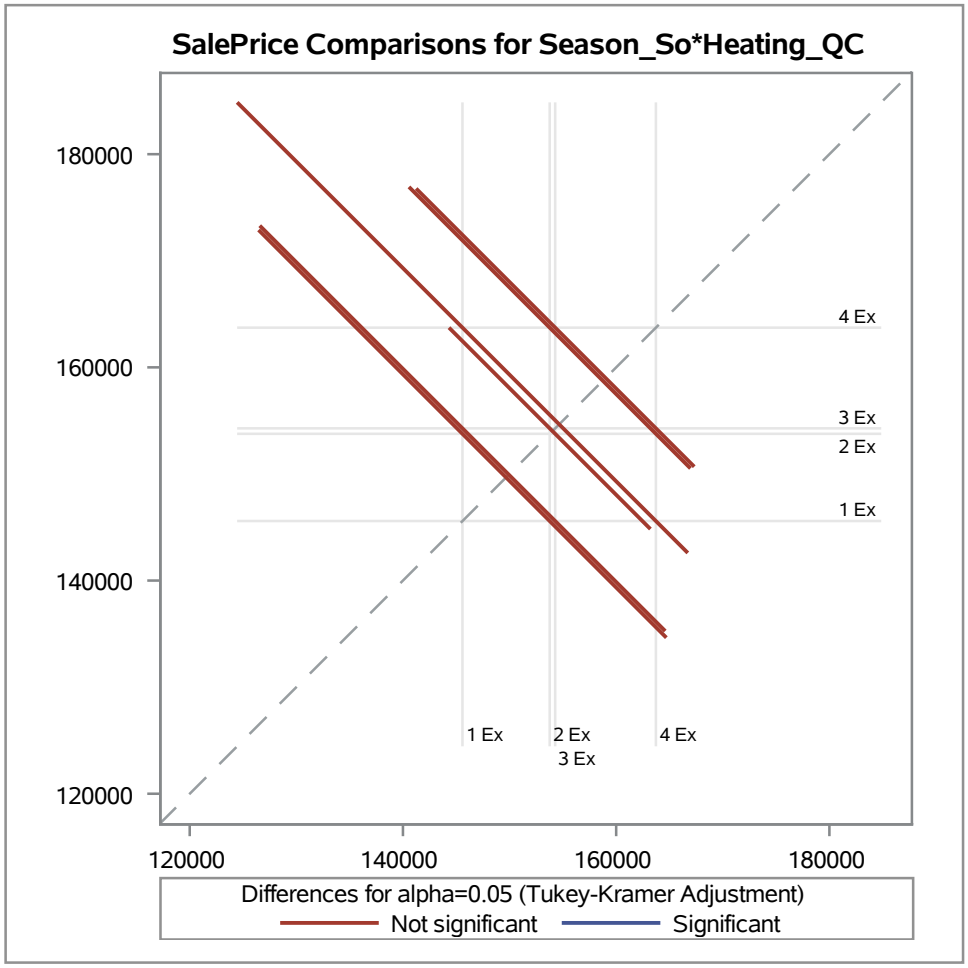
Class Level Information		
Class	**Levels**	**Values**
Season_Sold	4	1 2 3 4
Heating_QC	4	Ex Fa Gd TA

F Test for Season_So*Heating_QC Least Squares Means Slice				
Slice	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Heating_QC Ex	3	284	0.51	0.6746

Simple Differences of Season_So*Heating_QC Least Squares Means Adjustment for Multiple Comparisons: Tukey-Kramer								
Slice	**Season when house sold**	**Season when house sold**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**	**Adj P**
Heating_QC Ex	1	2	-8181.91	14800	284	-0.55	0.5808	0.9457
Heating_QC Ex	1	3	-8696.09	14716	284	-0.59	0.5550	0.9348
Heating_QC Ex	1	4	-18144	16356	284	-1.11	0.2682	0.6841
Heating_QC Ex	2	3	-514.18	7310.43	284	-0.07	0.9440	0.9999
Heating_QC Ex	2	4	-9961.69	10218	284	-0.97	0.3304	0.7638
Heating_QC Ex	3	4	-9447.51	10095	284	-0.94	0.3502	0.7856

Model with Heating Quality and Season as Interacting Predictors

The PLM Procedure

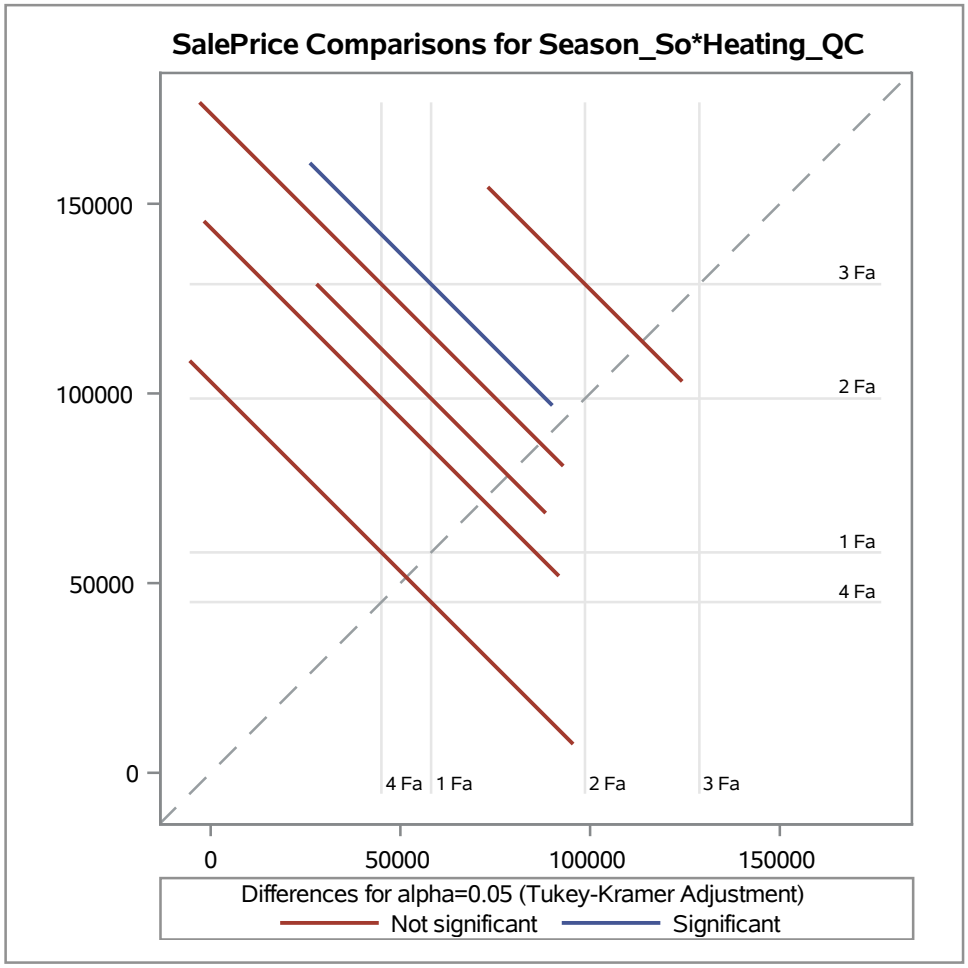


F Test for Season_So*Heating_QC Least Squares Means Slice				
Slice	Num DF	Den DF	F Value	Pr > F
Heating_QC Fa	3	284	3.58	0.0143

Simple Differences of Season_So*Heating_QC Least Squares Means Adjustment for Multiple Comparisons: Tukey-Kramer								
Slice	Season when house sold	Season when house sold	Estimate	Standard Error	DF	t Value	Pr > |t|	Adj P
Heating_QC Fa	1	2	-40557	23366	284	-1.74	0.0837	0.3071
Heating_QC Fa	1	3	-70700	24728	284	-2.86	0.0046	0.0235
Heating_QC Fa	1	4	13100	39099	284	0.34	0.7378	0.9870
Heating_QC Fa	2	3	-30143	19827	284	-1.52	0.1295	0.4267
Heating_QC Fa	2	4	53657	36198	284	1.48	0.1394	0.4495
Heating_QC Fa	3	4	83800	37092	284	2.26	0.0246	0.1102

Model with Heating Quality and Season as Interacting Predictors

The PLM Procedure

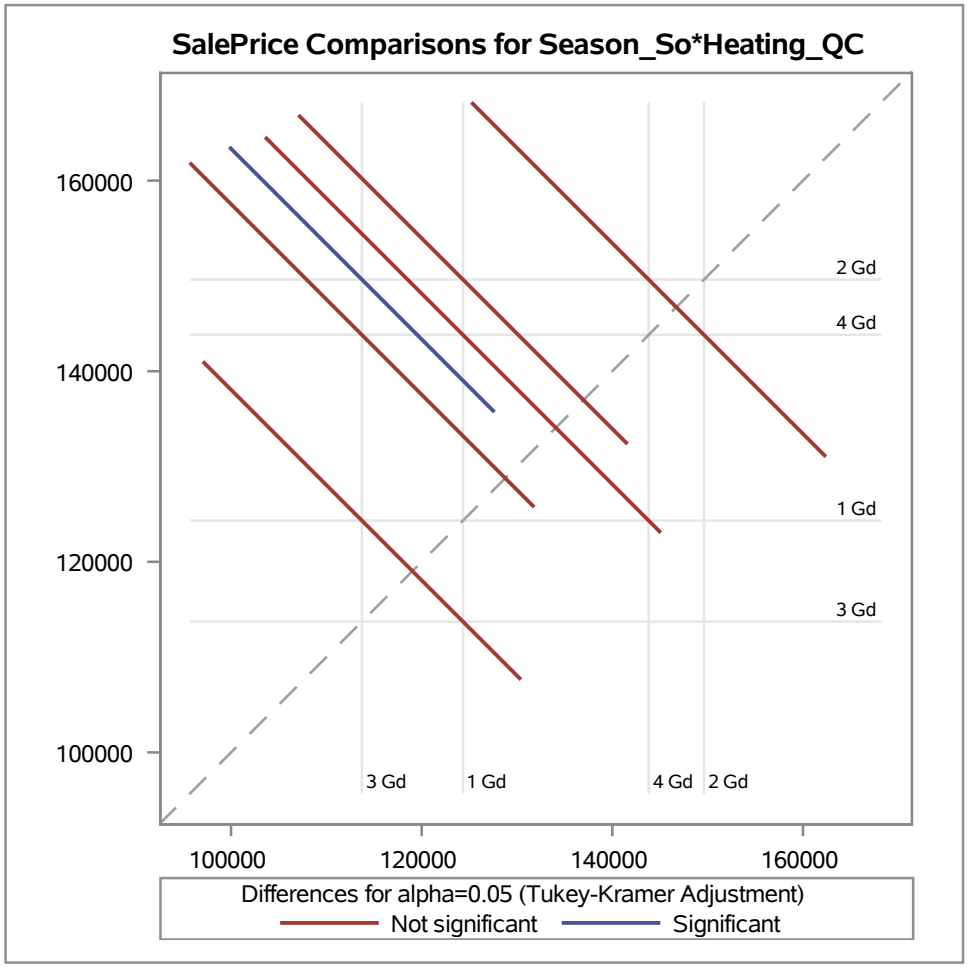


F Test for Season_So*Heating_QC Least Squares Means Slice				
Slice	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Heating_QC Gd	3	284	4.23	0.0060

Simple Differences of Season_So*Heating_QC Least Squares Means Adjustment for Multiple Comparisons: Tukey-Kramer								
Slice	**Season when house sold**	**Season when house sold**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**	**Adj P**
Heating_QC Gd	1	2	-25290	13355	284	-1.89	0.0593	0.2330
Heating_QC Gd	1	3	10603	12914	284	0.82	0.4123	0.8445
Heating_QC Gd	1	4	-19483	16061	284	-1.21	0.2261	0.6191
Heating_QC Gd	2	3	35893	10762	284	3.34	0.0010	0.0053
Heating_QC Gd	2	4	5807.33	14388	284	0.40	0.6868	0.9777
Heating_QC Gd	3	4	-30085	13980	284	-2.15	0.0322	0.1394

Model with Heating Quality and Season as Interacting Predictors

The PLM Procedure

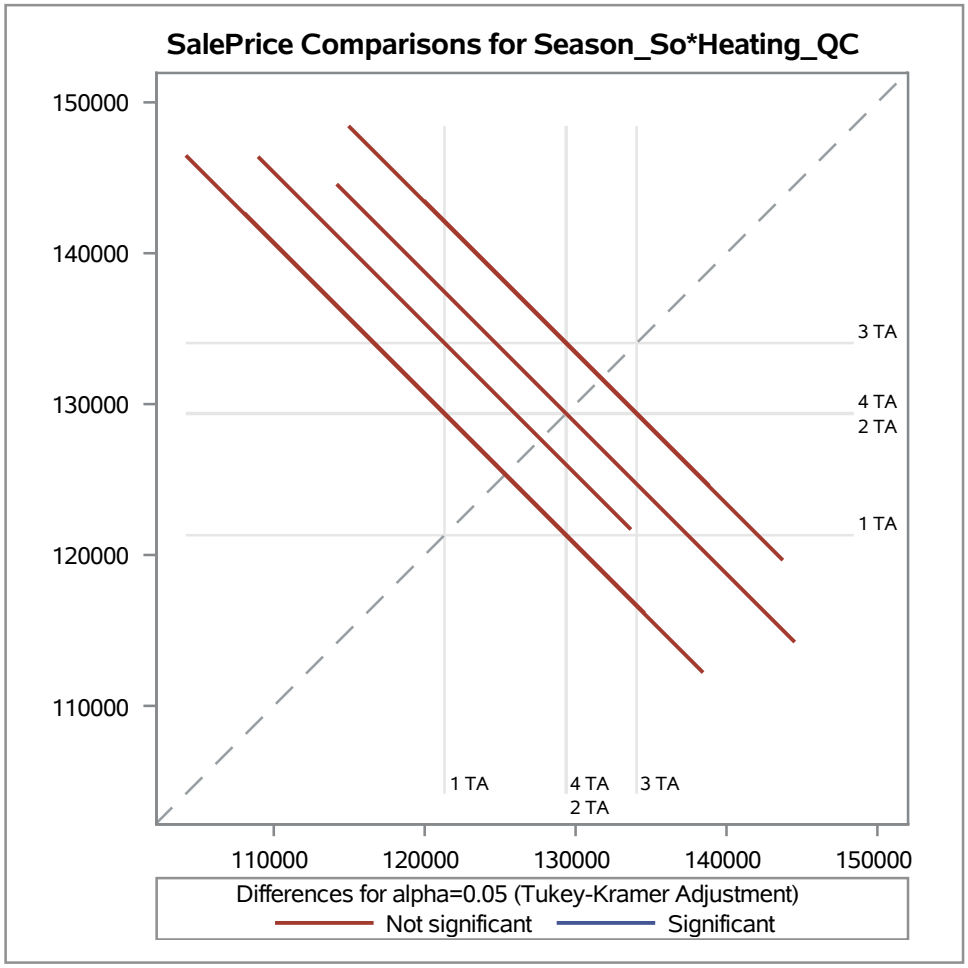


F Test for Season_So*Heating_QC Least Squares Means Slice				
Slice	Num DF	Den DF	F Value	Pr > F
Heating_QC TA	3	284	0.62	0.6021

Simple Differences of Season_So*Heating_QC Least Squares Means Adjustment for Multiple Comparisons: Tukey-Kramer								
Slice	Season when house sold	Season when house sold	Estimate	Standard Error	DF	t Value	Pr > |t|	Adj P
Heating_QC TA	1	2	-8091.91	10265	284	-0.79	0.4312	0.8598
Heating_QC TA	1	3	-12734	9561.68	284	-1.33	0.1840	0.5434
Heating_QC TA	1	4	-8032.95	13262	284	-0.61	0.5452	0.9302
Heating_QC TA	2	3	-4642.14	7313.62	284	-0.63	0.5261	0.9207
Heating_QC TA	2	4	58.9572	11745	284	0.01	0.9960	1.0000
Heating_QC TA	3	4	4701.10	11135	284	0.42	0.6732	0.9747

Model with Heating Quality and Season as Interacting Predictors

The PLM Procedure



Model with Heating Quality and Season as Interacting Predictors

The PLM Procedure