SAS Program for CRAC Design-HOUSE_PRICES

Obs	GRADE	FLOORS	BEDROOMS	SQFT_LIVING	PRICE
1	7	1	2	1160	468000
2	7	1	2	1200	189000
3	7	1	2	1070	252700
4	7	1	2	1980	585000
5	7	1	2	2020	355000
6	7	1	3	1180	221900
7	7	1	3	1060	291850
8	7	1	3	1780	229500
9	7	1	3	1370	400000
10	7	1	3	1250	230000
11	7	1	4	1960	604000
12	7	1	4	1620	385000
13	7	1	4	2060	322500
14	7	1	4	1220	240000
15	7	1	4	1760	380000
16	7	1.5	2	1430	455000
17	7	1.5	2	1420	592500
18	7	1.5	2	1490	625000
19	7	1.5	2	2130	730000
20	7	1.5	2	1100	450000
21	7	1.5	3	1430	310000
22	7	1.5	3	2770	317625
23	7	1.5	3	1980	555000
24	7	1.5	3	1670	460000
25	7	1.5	3	1110	560000
26	7	1.5	4	1600	485000
27	7	1.5	4	2330	687500
28	7	1.5	4	2750	571000
29	7	1.5	4	1610	535000
30	7	1.5	4	2100	445000
31	7	2	2	1610	215000
32	7	2	2	1030	335000
33	7	2	2	2420	430000
34	7	2	2	1050	163500
35	7	2	2	1450	655000
36	7	2	3	2570	538000
37	7	2	3	1715	257500

SAS Program for CRAC Design-HOUSE_PRICES

Obs	GRADE	FLOORS	BEDROOMS	SQFT_LIVING	PRICE
38	7	2	3	1890	323000
39	7	2	3	1890	395000
40	7	2	3	1570	685000
41	7	2	4	2250	292500
42	7	2	4	2240	287000
43	7	2	4	1900	360000
44	7	2	4	1980	243500
45	7	2	4	2070	430000
46	8	1	2	1240	188500
47	8	1	2	3900	1072000
48	8	1	2	1320	467000
49	8	1	2	1510	479950
50	8	1	2	1420	641000
51	8	1	3	1680	510000
52	8	1	3	3560	662500
53	8	1	3	2150	650000
54	8	1	3	1680	356000
55	8	1	3	1580	430000
56	8	1	4	4220	775000
57	8	1	4	2160	260000
58	8	1	4	2010	660500
59	8	1	4	2590	452000
60	8	1	4	2030	500000
61	8	1.5	2	1410	439900
62	8	1.5	2	1600	672324
63	8	1.5	2	2700	1260000
64	8	1.5	2	1750	575000
65	8	1.5	2	1700	710000
66	8	1.5	3	1400	667000
67	8	1.5	3	1090	535000
68	8	1.5	3	2300	696000
69	8	1.5	3	1660	780000
70	8	1.5	3	1180	610000
71	8	1.5	4	2750	1450000
72	8	1.5	4	2370	834000
73	8	1.5	4	2610	1000000
74	8	1.5	4	1820	1010000

SAS Program for CRAC Design-HOUSE_PRICES

Obs	GRADE	FLOORS	BEDROOMS	SQFT_LIVING	PRICE
75	8	1.5	4	2440	780000
76	8	2	2	1230	490000
77	8	2	2	1400	372500
78	8	2	2	1270	531000
79	8	2	2	1180	419000
80	8	2	2	1370	359000
81	8	2	3	2450	329000
82	8	2	3	2450	937000
83	8	2	3	2320	580500
84	8	2	3	3160	488000
85	8	2	3	2420	301000
86	8	2	4	2570	719000
87	8	2	4	2360	640000
88	8	2	4	2620	605000
89	8	2	4	1850	430000
90	8	2	4	2380	360000
91	9	1	2	2680	775000
92	9	1	2	1880	460000
93	9	1	2	3570	835000
94	9	1	2	1670	539950
95	9	1	2	1910	435000
96	9	1	3	3050	2000000
97	9	1	3	2753	1350000
98	9	1	3	2370	790000
99	9	1	3	2930	559900
100	9	1	3	2500	662000
101	9	1	4	2480	840000
102	9	1	4	2240	592500
103	9	1	4	3650	2400000
104	9	1	4	1710	749000
105	9	1	4	3140	578000
106	9	1.5	2	2360	1087500
107	9	1.5	2	2460	1370000
108	9	1.5	2	1590	850000
109	9	1.5	2	2320	1150000
110	9	1.5	2	1410	399900
111	9	1.5	3	2070	850830

SAS Program for CRAC Design-HOUSE_PRICES

Obs	GRADE	FLOORS	BEDROOMS	SQFT_LIVING	PRICE
112	9	1.5	3	3950	784000
113	9	1.5	3	2170	876650
114	9	1.5	3	2730	1338750
115	9	1.5	3	2350	339000
116	9	1.5	4	2050	740000
117	9	1.5	4	5450	610000
118	9	1.5	4	3190	1249000
119	9	1.5	4	3040	870000
120	9	1.5	4	3160	1280000
121	9	2	2	1070	259950
122	9	2	2	1780	935000
123	9	2	2	1590	409900
124	9	2	2	2540	945000
125	9	2	2	1295	487028
126	9	2	3	2140	940000
127	9	2	3	2770	461000
128	9	2	3	2320	437500
129	9	2	3	2910	770000
130	9	2	3	2714	465000
131	9	2	4	2950	650000
132	9	2	4	2570	625000
133	9	2	4	2290	785000
134	9	2	4	2830	885000
135	9	2	4	3230	480000

SAS Program for CRAC Design-HOUSE_PRICES

The GLM Procedure

Class Level Information		
Class	**Levels**	**Values**
GRADE	3	7 8 9
FLOORS	3	1 2 1.5

Number of Observations Read	135
Number of Observations Used	135

SAS Program for CRAC Design-HOUSE_PRICES

The GLM Procedure

Dependent Variable: PRICE   PRICE

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	5.0861117E12	1.2715279E12	16.24	<.0001
Error	130	1.0179222E13	78301705839		
Corrected Total	134	1.5265333E13			

R-Square	Coeff Var	Root MSE	PRICE Mean
0.333181	45.44511	279824.4	615741.5

Source	DF	Type I SS	Mean Square	F Value	Pr > F
GRADE	2	3.7431265E12	1.8715633E12	23.90	<.0001
FLOORS	2	1.3429852E12	671492587159	8.58	0.0003

Source	DF	Type III SS	Mean Square	F Value	Pr > F
GRADE	2	3.7431265E12	1.8715633E12	23.90	<.0001
FLOORS	2	1.3429852E12	671492587159	8.58	0.0003

Interaction Plot for PRICE

SAS Program for CRAC Design-HOUSE_PRICES

The GLM Procedure

Distribution of PRICE
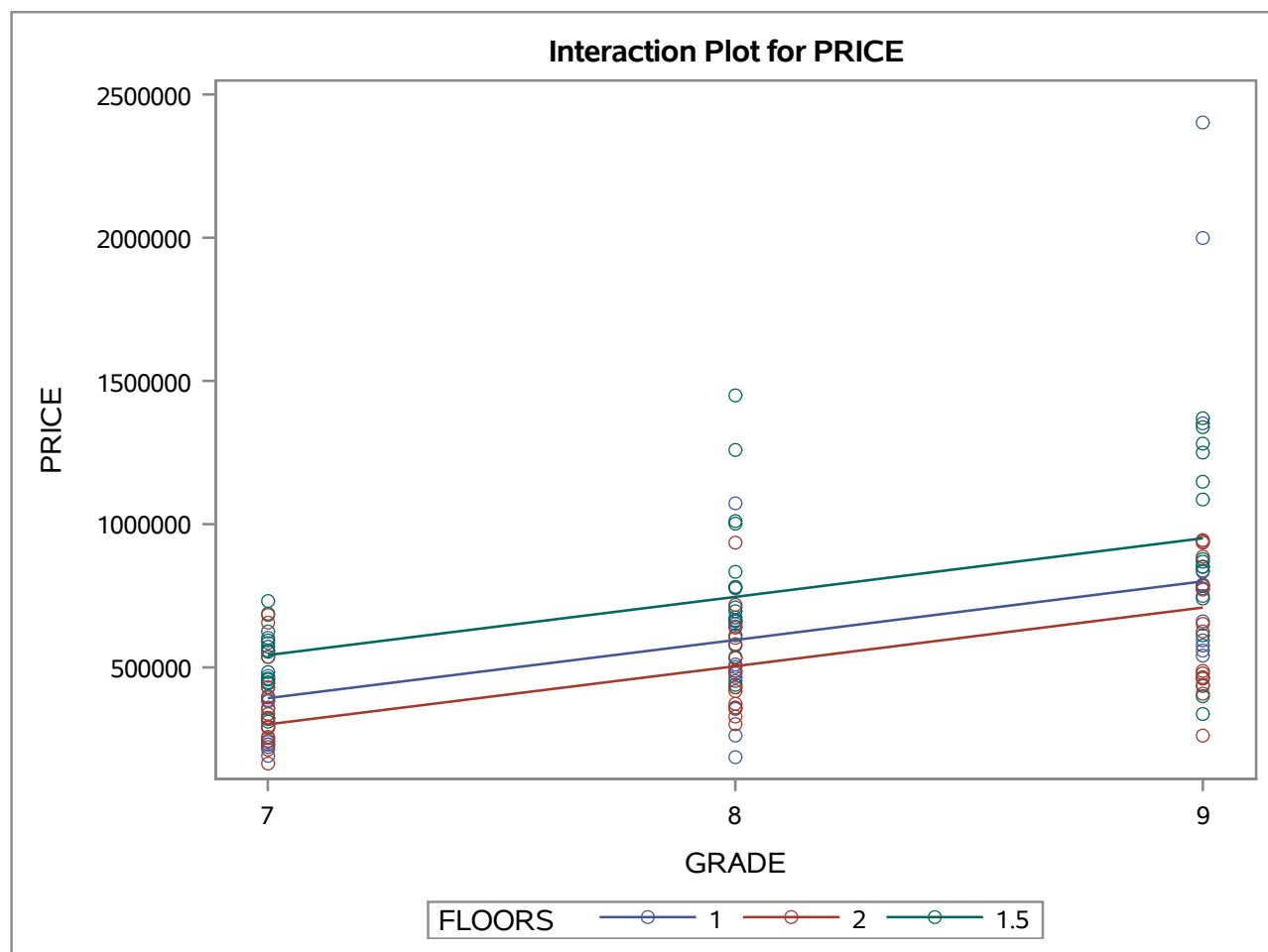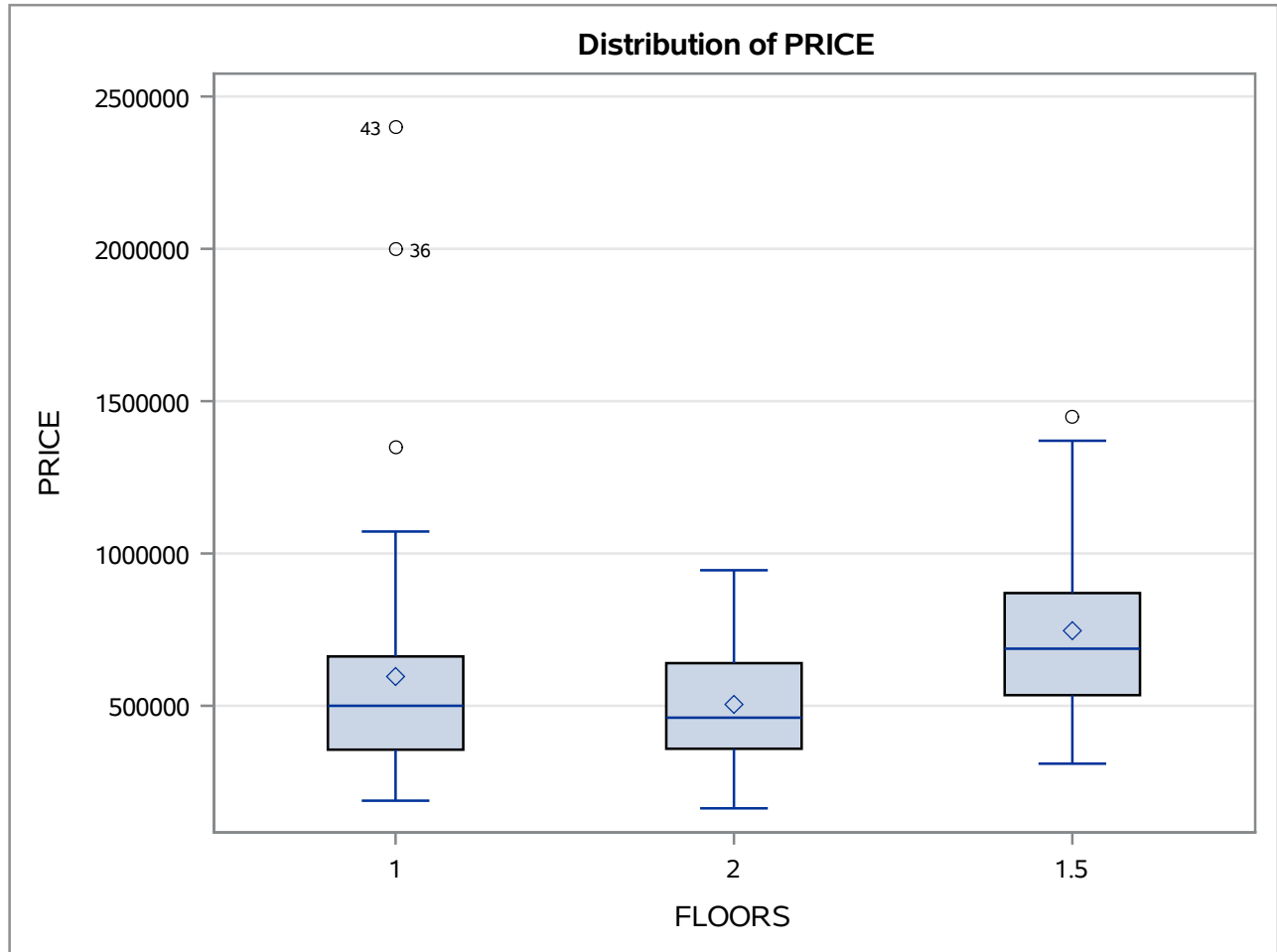
SAS Program for CRAC Design-HOUSE_PRICES

The GLM Procedure

Ryan-Einot-Gabriel-Welsch Multiple Range Test for PRICE

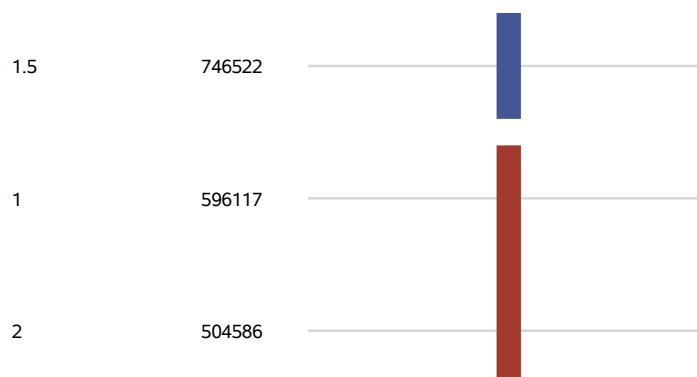**Note:** This test controls the Type I experimentwise error rate.

Alpha	0.05
Error Degrees of Freedom	130
Error Mean Square	7.83E10

Number of Means	2	3
Critical Range	116708.96	139862.25

PRICE REGWQ Grouping for Means of FLOORS (Alpha = 0.05)
Means covered by the same bar are not significantly different.

FLOORS	Estimate
1.5	746522
1	596117
2	504586

SAS Program for CRAC Design-HOUSE_PRICES

The GLM Procedure

Tukey's Studentized Range (HSD) Test for PRICE

Note: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ.

Alpha	0.05
Error Degrees of Freedom	130
Error Mean Square	7.83E10
Critical Value of Studentized Range	3.35290
Minimum Significant Difference	139862

PRICE Tukey Grouping for Means of FLOORS
(Alpha = 0.05)
Means covered by the same bar are not significantly different.

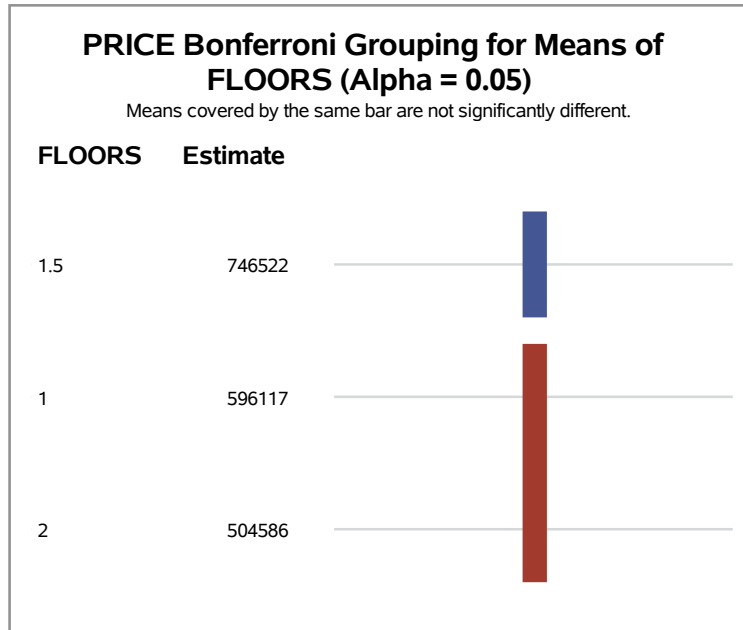| FLOORS	Estimate
1.5	746522
1	596117
2	504586
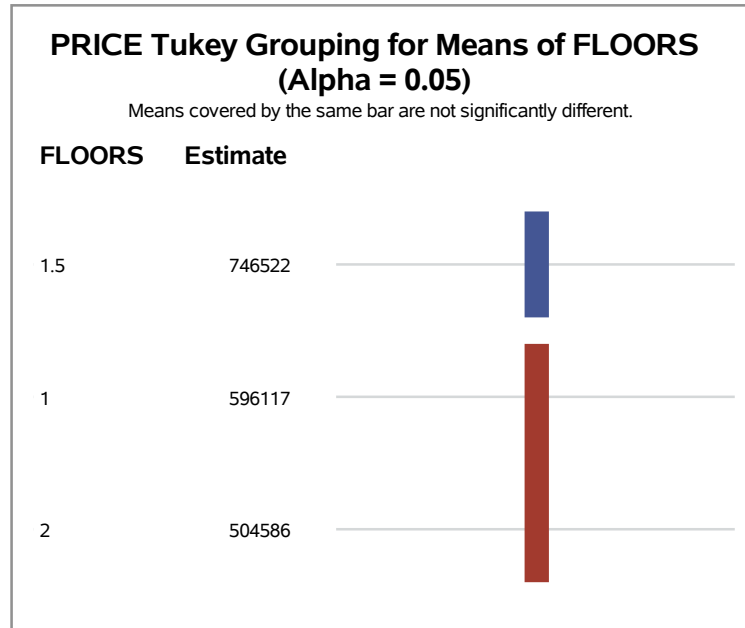
SAS Program for CRAC Design-HOUSE_PRICES

The GLM Procedure

Bonferroni (Dunn) t Tests for PRICE

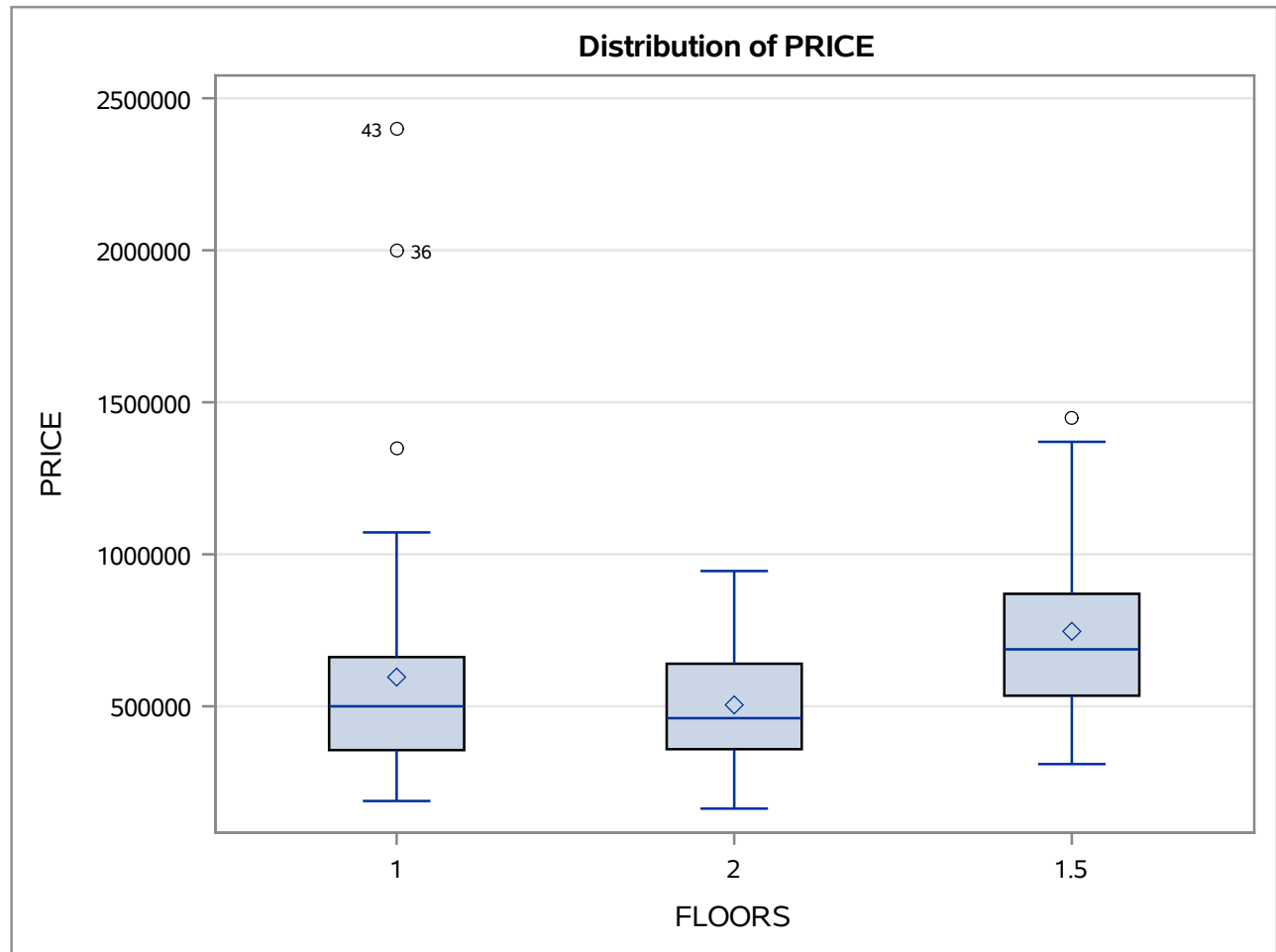**Note:** This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ.

Alpha	0.05
Error Degrees of Freedom	130
Error Mean Square	7.83E10
Critical Value of t	2.42535
Minimum Significant Difference	143077

PRICE Bonferroni Grouping for Means of FLOORS (Alpha = 0.05)

Means covered by the same bar are not significantly different.

FLOORS	Estimate
1.5	746522
1	596117
2	504586

SAS Program for CRAC Design-HOUSE_PRICES

The GLM Procedure

Distribution of PRICE

Level of FLOORS	N	PRICE	
		Mean	Std Dev
1	45	596116.667	425098.150
2	45	504586.178	211744.676
1.5	45	746521.756	301451.094

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1 GRADE=7

Moments			
N	15	Sum Weights	15
Mean	343630	Sum Observations	5154450
Std Deviation	129466.534	Variance	1.67616E10
Skewness	0.89132195	Kurtosis	-0.0288712
Uncorrected SS	2.00589E12	Corrected SS	2.34662E11
Coeff Variation	37.6761442	Std Error Mean	33428.1154

Basic Statistical Measures			
Location		**Variability**	
Mean	343630.0	Std Deviation	129467
Median	322500.0	Variance	1.67616E10
Mode	.	Range	415000
		Interquartile Range	170000

Tests for Location: Mu0=0				
Test	**Statistic**		**p Value**	
Student's t	t	10.27967	Pr > |t|	<.0001
Sign	M	7.5	Pr >= |M|	<.0001
Signed Rank	S	60	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	**Quantile**
100% Max	604000
99%	604000
95%	604000
90%	585000
75% Q3	400000
50% Median	322500
25% Q1	230000
10%	221900
5%	189000
1%	189000
0% Min	189000

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1 GRADE=7

Extreme Observations							
Lowest				Highest			
Value	FLOORS	GRADE	Obs	Value	FLOORS	GRADE	Obs
189000	1	7	2	385000	1	7	12
221900	1	7	6	400000	1	7	9
229500	1	7	8	468000	1	7	1
230000	1	7	10	585000	1	7	4
240000	1	7	14	604000	1	7	11

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1 GRADE=8

Moments			
N	15	Sum Weights	15
Mean	540296.667	Sum Observations	8104450
Std Deviation	216656.811	Variance	4.69402E10
Skewness	0.76657856	Kurtosis	1.54405401
Uncorrected SS	5.03597E12	Corrected SS	6.57162E11
Coeff Variation	40.0996016	Std Error Mean	55940.548

Basic Statistical Measures			
Location		**Variability**	
Mean	540296.7	Std Deviation	216657
Median	500000.0	Variance	4.69402E10
Mode	.	Range	883500
		Interquartile Range	230500

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	9.658409	Pr > |t|	<.0001
Sign	M	7.5	Pr >= |M|	<.0001
Signed Rank	S	60	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	1072000
99%	1072000
95%	1072000
90%	775000
75% Q3	660500
50% Median	500000
25% Q1	430000
10%	260000
5%	188500
1%	188500
0% Min	188500

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1 GRADE=8

Extreme Observations							
Lowest				Highest			
Value	FLOORS	GRADE	Obs	Value	FLOORS	GRADE	Obs
188500	1	8	16	650000	1	8	23
260000	1	8	27	660500	1	8	28
356000	1	8	24	662500	1	8	22
430000	1	8	25	775000	1	8	26
452000	1	8	29	1072000	1	8	17

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1 GRADE=9

Moments			
N	15	Sum Weights	15
Mean	904423.333	Sum Observations	13566350
Std Deviation	575113.08	Variance	3.30755E11
Skewness	1.89806371	Kurtosis	2.88834026
Uncorrected SS	1.69003E13	Corrected SS	4.63057E12
Coeff Variation	63.5889256	Std Error Mean	148493.559

Basic Statistical Measures			
Location		**Variability**	
Mean	904423.3	Std Deviation	575113
Median	749000.0	Variance	3.30755E11
Mode	.	Range	1965000
		Interquartile Range	280100

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	6.090657	Pr > |t|	<.0001
Sign	M	7.5	Pr >= |M|	<.0001
Signed Rank	S	60	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	2400000
99%	2400000
95%	2400000
90%	2000000
75% Q3	840000
50% Median	749000
25% Q1	559900
10%	460000
5%	435000
1%	435000
0% Min	435000

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1 GRADE=9

Extreme Observations							
Lowest				Highest			
Value	FLOORS	GRADE	Obs	Value	FLOORS	GRADE	Obs
435000	1	9	35	835000	1	9	33
460000	1	9	32	840000	1	9	41
539950	1	9	34	1350000	1	9	37
559900	1	9	39	2000000	1	9	36
578000	1	9	45	2400000	1	9	43

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1.5 GRADE=7

Moments			
N	15	Sum Weights	15
Mean	518575	Sum Observations	7778625
Std Deviation	119130.385	Variance	1.4192E10
Skewness	-0.1099894	Kurtosis	-0.175482
Uncorrected SS	4.23249E12	Corrected SS	1.98689E11
Coeff Variation	22.9726433	Std Error Mean	30759.3332

Basic Statistical Measures			
Location		Variability	
Mean	518575.0	Std Deviation	119130
Median	535000.0	Variance	1.4192E10
Mode	.	Range	420000
		Interquartile Range	142500

Tests for Location: Mu0=0				
Test		Statistic	p Value	
Student's t	t	16.85911	Pr > |t|	<.0001
Sign	M	7.5	Pr >= |M|	<.0001
Signed Rank	S	60	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	730000
99%	730000
95%	730000
90%	687500
75% Q3	592500
50% Median	535000
25% Q1	450000
10%	317625
5%	310000
1%	310000
0% Min	310000

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1.5 GRADE=7

Extreme Observations							
Lowest				Highest			
Value	FLOORS	GRADE	Obs	Value	FLOORS	GRADE	Obs
310000	1.5	7	51	571000	1.5	7	58
317625	1.5	7	52	592500	1.5	7	47
445000	1.5	7	60	625000	1.5	7	48
450000	1.5	7	50	687500	1.5	7	57
455000	1.5	7	46	730000	1.5	7	49

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1.5 GRADE=8

Moments			
N	15	Sum Weights	15
Mean	801281.6	Sum Observations	12019224
Std Deviation	275118.096	Variance	7.569E10
Skewness	1.16887687	Kurtosis	1.05829672
Uncorrected SS	1.06904E13	Corrected SS	1.05966E12
Coeff Variation	34.3347577	Std Error Mean	71035.1869

Basic Statistical Measures			
Location		Variability	
Mean	801281.6	Std Deviation	275118
Median	710000.0	Variance	7.569E10
Mode	780000.0	Range	1010100
		Interquartile Range	390000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	11.28007	Pr > |t|	<.0001
Sign	M	7.5	Pr >= |M|	<.0001
Signed Rank	S	60	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	1450000
99%	1450000
95%	1450000
90%	1260000
75% Q3	1000000
50% Median	710000
25% Q1	610000
10%	535000
5%	439900
1%	439900
0% Min	439900

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1.5 GRADE=8

Extreme Observations							
Lowest				Highest			
Value	FLOORS	GRADE	Obs	Value	FLOORS	GRADE	Obs
439900	1.5	8	61	834000	1.5	8	72
535000	1.5	8	67	1000000	1.5	8	73
575000	1.5	8	64	1010000	1.5	8	74
610000	1.5	8	70	1260000	1.5	8	63
667000	1.5	8	66	1450000	1.5	8	71

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1.5 GRADE=9

Moments			
N	15	Sum Weights	15
Mean	919708.667	Sum Observations	13795630
Std Deviation	323570.732	Variance	1.04698E11
Skewness	-0.2697103	Kurtosis	-0.7464522
Uncorrected SS	1.41537E13	Corrected SS	1.46577E12
Coeff Variation	35.1818727	Std Error Mean	83545.6038

Basic Statistical Measures			
Location		Variability	
Mean	919708.7	Std Deviation	323571
Median	870000.0	Variance	1.04698E11
Mode	.	Range	1031000
		Interquartile Range	509000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	11.00846	Pr > |t|	<.0001
Sign	M	7.5	Pr >= |M|	<.0001
Signed Rank	S	60	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	1370000
99%	1370000
95%	1370000
90%	1338750
75% Q3	1249000
50% Median	870000
25% Q1	740000
10%	399900
5%	339000
1%	339000
0% Min	339000

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=1.5 GRADE=9

Extreme Observations							
Lowest				Highest			
Value	FLOORS	GRADE	Obs	Value	FLOORS	GRADE	Obs
339000	1.5	9	85	1150000	1.5	9	79
399900	1.5	9	80	1249000	1.5	9	88
610000	1.5	9	87	1280000	1.5	9	90
740000	1.5	9	86	1338750	1.5	9	84
784000	1.5	9	82	1370000	1.5	9	77

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=2 GRADE=7

Moments			
N	15	Sum Weights	15
Mean	374000	Sum Observations	5610000
Std Deviation	153067.212	Variance	2.34296E10
Skewness	0.88465222	Kurtosis	0.13843368
Uncorrected SS	2.42615E12	Corrected SS	3.28014E11
Coeff Variation	40.9270621	Std Error Mean	39521.7842

Basic Statistical Measures			
Location		Variability	
Mean	374000.0	Std Deviation	153067
Median	335000.0	Variance	2.34296E10
Mode	430000.0	Range	521500
		Interquartile Range	172500

Tests for Location: Mu0=0				
Test		Statistic	p Value	
Student's t	t	9.463136	Pr > |t|	<.0001
Sign	M	7.5	Pr >= |M|	<.0001
Signed Rank	S	60	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	685000
99%	685000
95%	685000
90%	655000
75% Q3	430000
50% Median	335000
25% Q1	257500
10%	215000
5%	163500
1%	163500
0% Min	163500

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=2 GRADE=7

Extreme Observations							
Lowest				Highest			
Value	FLOORS	GRADE	Obs	Value	FLOORS	GRADE	Obs
163500	2	7	94	430000	2	7	93
215000	2	7	91	430000	2	7	105
243500	2	7	104	538000	2	7	96
257500	2	7	97	655000	2	7	95
287000	2	7	102	685000	2	7	100

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=2 GRADE=8

Moments			
N	15	Sum Weights	15
Mean	504066.667	Sum Observations	7561000
Std Deviation	171762.384	Variance	2.95023E10
Skewness	1.17090215	Kurtosis	1.488004
Uncorrected SS	4.22428E12	Corrected SS	4.13032E11
Coeff Variation	34.0753308	Std Error Mean	44348.8569

Basic Statistical Measures			
Location		Variability	
Mean	504066.7	Std Deviation	171762
Median	488000.0	Variance	2.95023E10
Mode	.	Range	636000
		Interquartile Range	245000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	11.36594	Pr > |t|	<.0001
Sign	M	7.5	Pr >= |M|	<.0001
Signed Rank	S	60	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	937000
99%	937000
95%	937000
90%	719000
75% Q3	605000
50% Median	488000
25% Q1	360000
10%	329000
5%	301000
1%	301000
0% Min	301000

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=2 GRADE=8

Extreme Observations							
Lowest				Highest			
Value	FLOORS	GRADE	Obs	Value	FLOORS	GRADE	Obs
301000	2	8	115	580500	2	8	113
329000	2	8	111	605000	2	8	118
359000	2	8	110	640000	2	8	117
360000	2	8	120	719000	2	8	116
372500	2	8	107	937000	2	8	112

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=2 GRADE=9

Moments			
N	15	Sum Weights	15
Mean	635691.867	Sum Observations	9535378
Std Deviation	226479.784	Variance	5.12931E10
Skewness	0.11440846	Kurtosis	-1.3730068
Uncorrected SS	6.77967E12	Corrected SS	7.18103E11
Coeff Variation	35.6272898	Std Error Mean	58476.8287

Basic Statistical Measures			
Location		Variability	
Mean	635691.9	Std Deviation	226480
Median	625000.0	Variance	5.12931E10
Mode	.	Range	685050
		Interquartile Range	424000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	10.87083	Pr > |t|	<.0001
Sign	M	7.5	Pr >= |M|	<.0001
Signed Rank	S	60	Pr >= |S|	<.0001

Quantiles (Definition 5)	
Level	Quantile
100% Max	945000
99%	945000
95%	945000
90%	940000
75% Q3	885000
50% Median	625000
25% Q1	461000
10%	409900
5%	259950
1%	259950
0% Min	259950

SAS Program for CRAC Design-HOUSE_PRICES

The UNIVARIATE Procedure
Variable: PRICE (PRICE)

FLOORS=2 GRADE=9

Extreme Observations							
Lowest				Highest			
Value	FLOORS	GRADE	Obs	Value	FLOORS	GRADE	Obs
259950	2	9	121	785000	2	9	133
409900	2	9	123	885000	2	9	134
437500	2	9	128	935000	2	9	122
461000	2	9	127	940000	2	9	126
465000	2	9	130	945000	2	9	124