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18 November 2010
STA3024
Prof. Ramsier

Assignment Six

1a.

The SAS System 09:44 Thursday, November 18, 2010 1

The CORR Procedure

8 Variables: _Fat Age Weight Height Chest Abdomen Hip Thigh

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum	Label
_Fat	50	17.78800	9.08130	889.40000	4.60000	38.20000	%Fat
Age	50	33.66000	8.40216	1683	22.00000	50.00000	Age
Weight	50	183.25800	40.25778	9163	125.25000	363.15000	Weight
Height	50	69.33000	6.33492	3467	29.50000	76.00000	Height
Chest	50	101.12800	10.61432	5056	83.40000	136.20000	Chest
Abdomen	50	92.08000	14.50890	4604	70.40000	148.10000	Abdomen
Hip	50	102.05800	10.46491	5103	85.30000	147.70000	Hip
Thigh	50	61.50600	6.71564	3075	50.00000	87.30000	Thigh

Pearson Correlation Coefficients, N = 50
Prob > |r| under H0: Rho=0

	_Fat	Age	Weight	Height	Chest	Abdomen	Hip	Thigh
_Fat	1.00000	0.51738	0.61172	-0.26640	0.72252	0.82370	0.69262	0.68222
%Fat		0.0001	<.0001	0.0615	<.0001	<.0001	<.0001	<.0001
Age	0.51738	1.00000	0.26524	-0.27631	0.37595	0.44230	0.31380	0.21853
Age	0.0001		0.0627	0.0521	0.0071	0.0013	0.0265	0.1273
Weight	0.61172	0.26524	1.00000	0.10898	0.91233	0.91459	0.95947	0.93720
Weight	<.0001	0.0627		0.4512	<.0001	<.0001	<.0001	<.0001
Height	-0.26640	-0.27631	0.10898	1.00000	0.01356	-0.05248	-0.04544	-0.03657
Height	0.0615	0.0521	0.4512		0.9256	0.7174	0.7540	0.8010
Chest	0.72252	0.37595	0.91233	0.01356	1.00000	0.94209	0.91132	0.85912
Chest	<.0001	0.0071	<.0001	0.9256		<.0001	<.0001	<.0001
Abdomen	0.82370	0.44230	0.91459	-0.05248	0.94209	1.00000	0.94202	0.89030
Abdomen	<.0001	0.0013	<.0001	0.7174	<.0001		<.0001	<.0001
Hip	0.69262	0.31380	0.95947	-0.04544	0.91132	0.94202	1.00000	0.93773
Hip	<.0001	0.0265	<.0001	0.7540	<.0001	<.0001		<.0001
Thigh	0.68222	0.21853	0.93720	-0.03657	0.85912	0.89030	0.93773	1.00000
Thigh	<.0001	0.1273	<.0001	0.8010	<.0001	<.0001	<.0001	

Fat percentage has a strong positive correlation with all variables except height. Age shows a significant positive correlation with %fat, and chest, abdomen, and hip measurements, and not significant for weight, height, and thigh measurements. Weight is positively correlated and significant with all variables except age and height. Height does not show any significant correlations with any variables, but is close to being significant to age and %fat.

Chest, abdomen, and hip measurements all display strong, positive correlations with all other variables except height.

1b.

The SAS System 09:44 Thursday, November 18, 2010 2

The REG Procedure
Model: Forward_Method
Dependent Variable: _Fat %Fat

Number of Observations Read 50
Number of Observations Used 50

Forward Selection: Step 1

Variable Abdomen Entered: R-Square = 0.6785 and C(p) = 37.6024

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	2741.74094	2741.74094	101.29	<.0001
Error	48	1299.29186	27.06858		
Corrected Total	49	4041.03280			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-29.68493	4.77404	1046.56437	38.66	<.0001
Abdomen	0.51556	0.05123	2741.74094	101.29	<.0001

Bounds on condition number: 1, 1

Forward Selection: Step 2

Variable Weight Entered: R-Square = 0.8011 and C(p) = 7.7062

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	3237.45068	1618.72534	94.68	<.0001
Error	47	803.58212	17.09749		
Corrected Total	49	4041.03280			

The SAS System 09:44 Thursday, November 18, 2010 3

The REG Procedure
Model: Forward_Method
Dependent Variable: _Fat %Fat

Forward Selection: Step 2

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-39.53497	4.21216	1506.20811	88.10	<.0001
Weight	-0.19538	0.03629	495.70974	28.99	<.0001

Abdomen	1.01138	0.10068	1725.30723	100.91	<.0001

Bounds on condition number: 6.1154, 24.462

Forward Selection: Step 3

Variable Thigh Entered: R-Square = 0.8278 and C(p) = 2.7708

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	3345.23622	1115.07874	73.72	<.0001
Error	46	695.79658	15.12601		
Corrected Total	49	4041.03280			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-59.00212	8.29934	764.49191	50.54	<.0001
Weight	-0.27708	0.04584	552.58481	36.53	<.0001
Abdomen	0.95027	0.09743	1438.99823	95.13	<.0001
Thigh	0.65143	0.24403	107.78554	7.13	0.0105

Bounds on condition number: 11.033, 78.62

Forward Selection: Step 4

Variable Age Entered: R-Square = 0.8347 and C(p) = 2.9866

The REG Procedure
Model: Forward_Method
Dependent Variable: _Fat %Fat

Forward Selection: Step 4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	3372.96419	843.24105	56.80	<.0001
Error	45	668.06861	14.84597		
Corrected Total	49	4041.03280			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-61.68925	8.45398	790.50543	53.25	<.0001
Age	0.11170	0.08173	27.72797	1.87	0.1785
Weight	-0.26798	0.04590	505.99508	34.08	<.0001
Abdomen	0.86322	0.11564	827.18267	55.72	<.0001
Thigh	0.73719	0.24977	129.32131	8.71	0.0050

Bounds on condition number: 11.271, 125.62

Forward Selection: Step 5

Variable Hip Entered: R-Square = 0.8369 and C(p) = 4.4080

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	3381.95749	676.39150	45.16	<.0001
Error	44	659.07531	14.97898		
Corrected Total	49	4041.03280			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-54.75849	12.33356	295.26277	19.71	<.0001
Age	0.11031	0.08212	27.02853	1.80	0.1861
Weight	-0.24716	0.05336	321.31575	21.45	<.0001
Abdomen	0.91125	0.13167	717.44447	47.90	<.0001
Hip	-0.18624	0.24035	8.99330	0.60	0.4426
Thigh	0.80034	0.26380	137.87719	9.20	0.0040

The REG Procedure
Model: Forward_Method
Dependent Variable: _Fat %Fat

Forward Selection: Step 5

Bounds on condition number: 20.695, 297.78

No other variable met the 0.5000 significance level for entry into the model.

Summary of Forward Selection

Step	Variable Entered	Label	Number Vars In	Partial R-Square	Model R-Square	C(p)	F Value	Pr > F
1	Abdomen	Abdomen	1	0.6785	0.6785	37.6024	101.29	<.0001
2	Weight	Weight	2	0.1227	0.8011	7.7062	28.99	<.0001
3	Thigh	Thigh	3	0.0267	0.8278	2.7708	7.13	0.0105
4	Age	Age	4	0.0069	0.8347	2.9866	1.87	0.1785
5	Hip	Hip	5	0.0022	0.8369	4.4080	0.60	0.4426

1c.

The REG Procedure
Model: Backward_Method
Dependent Variable: _Fat %Fat

Number of Observations Read 50
Number of Observations Used 50

Backward Elimination: Step 0

All Variables Entered: R-Square = 0.8385 and C(p) = 8.0000

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	3388.29760	484.04251	31.15	<.0001
Error	42	652.73520	15.54131		
Corrected Total	49	4041.03280			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-43.80465	22.69820	57.88222	3.72	0.0604
Age	0.09370	0.08761	17.77805	1.14	0.2909
Weight	-0.22112	0.07028	153.82966	9.90	0.0030
Height	-0.07334	0.11502	6.31898	0.41	0.5272
Chest	-0.01033	0.17340	0.05513	0.00	0.9528
Abdomen	0.92142	0.16307	496.17244	31.93	<.0001
Hip	-0.24858	0.26359	13.82187	0.89	0.3510
Thigh	0.74165	0.28626	104.32113	6.71	0.0131

Bounds on condition number: 25.242, 648.18

Backward Elimination: Step 1

Variable Chest Removed: R-Square = 0.8385 and C(p) = 6.0035

The REG Procedure
Model: Backward_Method
Dependent Variable: _Fat %Fat

Backward Elimination: Step 1

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	3388.24247	564.70708	37.20	<.0001
Error	43	652.79033	15.18117		
Corrected Total	49	4041.03280			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-44.37157	20.36590	72.06222	4.75	0.0349
Age	0.09393	0.08650	17.90044	1.18	0.2836
Weight	-0.22241	0.06607	172.04448	11.33	0.0016
Height	-0.07310	0.11361	6.28498	0.41	0.5234
Abdomen	0.91592	0.13275	722.64475	47.60	<.0001
Hip	-0.24781	0.26020	13.76933	0.91	0.3462
Thigh	0.74429	0.27950	107.65702	7.09	0.0109

Bounds on condition number: 23.932, 440.93

Backward Elimination: Step 2

Variable Height Removed: R-Square = 0.8369 and C(p) = 4.4080

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	3381.95749	676.39150	45.16	<.0001
Error	44	659.07531	14.97898		
Corrected Total	49	4041.03280			

The REG Procedure
Model: Backward_Method
Dependent Variable: _Fat %Fat

Backward Elimination: Step 2

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-54.75849	12.33356	295.26277	19.71	<.0001
Age	0.11031	0.08212	27.02853	1.80	0.1861
Weight	-0.24716	0.05336	321.31575	21.45	<.0001
Abdomen	0.91125	0.13167	717.44447	47.90	<.0001
Hip	-0.18624	0.24035	8.99330	0.60	0.4426
Thigh	0.80034	0.26380	137.87719	9.20	0.0040

Bounds on condition number: 20.695, 297.78

Backward Elimination: Step 3

Variable Hip Removed: R-Square = 0.8347 and C(p) = 2.9866

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	3372.96419	843.24105	56.80	<.0001
Error	45	668.06861	14.84597		
Corrected Total	49	4041.03280			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-61.68925	8.45398	790.50543	53.25	<.0001
Age	0.11170	0.08173	27.72797	1.87	0.1785
Weight	-0.26798	0.04590	505.99508	34.08	<.0001
Abdomen	0.86322	0.11564	827.18267	55.72	<.0001
Thigh	0.73719	0.24977	129.32131	8.71	0.0050

Bounds on condition number: 11.271, 125.62

Backward Elimination: Step 4

The REG Procedure

Model: Backward_Method
Dependent Variable: _Fat %Fat

Backward Elimination: Step 4

Variable Age Removed: R-Square = 0.8278 and C(p) = 2.7708

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	3345.23622	1115.07874	73.72	<.0001
Error	46	695.79658	15.12601		
Corrected Total	49	4041.03280			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-59.00212	8.29934	764.49191	50.54	<.0001
Weight	-0.27708	0.04584	552.58481	36.53	<.0001
Abdomen	0.95027	0.09743	1438.99823	95.13	<.0001
Thigh	0.65143	0.24403	107.78554	7.13	0.0105

Bounds on condition number: 11.033, 78.62

All variables left in the model are significant at the 0.1000 level.

Summary of Backward Elimination

Step	Variable Removed	Number Label	Vars In	Partial R-Square	Model R-Square	C(p)	F Value	Pr > F
1	Chest	Chest	6	0.0000	0.8385	6.0035	0.00	0.9528
2	Height	Height	5	0.0016	0.8369	4.4080	0.41	0.5234
3	Hip	Hip	4	0.0022	0.8347	2.9866	0.60	0.4426
4	Age	Age	3	0.0069	0.8278	2.7708	1.87	0.1785

1d.

The REG Procedure
Model: Stepwise_Method
Dependent Variable: _Fat %Fat

Number of Observations Read 50
Number of Observations Used 50

Stepwise Selection: Step 1

Variable Abdomen Entered: R-Square = 0.6785 and C(p) = 37.6024

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	2741.74094	2741.74094	101.29	<.0001
Error	48	1299.29186	27.06858		

Corrected Total	49	4041.03280

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-29.68493	4.77404	1046.56437	38.66	<.0001
Abdomen	0.51556	0.05123	2741.74094	101.29	<.0001

Bounds on condition number: 1, 1

Stepwise Selection: Step 2

Variable Weight Entered: R-Square = 0.8011 and C(p) = 7.7062

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	3237.45068	1618.72534	94.68	<.0001
Error	47	803.58212	17.09749		
Corrected Total	49	4041.03280			

The REG Procedure
Model: Stepwise_Method
Dependent Variable: _Fat %Fat

Stepwise Selection: Step 2

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-39.53497	4.21216	1506.20811	88.10	<.0001
Weight	-0.19538	0.03629	495.70974	28.99	<.0001
Abdomen	1.01138	0.10068	1725.30723	100.91	<.0001

Bounds on condition number: 6.1154, 24.462

Stepwise Selection: Step 3

Variable Thigh Entered: R-Square = 0.8278 and C(p) = 2.7708

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	3345.23622	1115.07874	73.72	<.0001
Error	46	695.79658	15.12601		
Corrected Total	49	4041.03280			

Variable	Parameter Estimate	Standard Error	Type II SS	F Value	Pr > F
Intercept	-59.00212	8.29934	764.49191	50.54	<.0001
Weight	-0.27708	0.04584	552.58481	36.53	<.0001
Abdomen	0.95027	0.09743	1438.99823	95.13	<.0001
Thigh	0.65143	0.24403	107.78554	7.13	0.0105

Bounds on condition number: 11.033, 78.62

All variables left in the model are significant at the 0.1500 level.

No other variable met the 0.1500 significance level for entry into the model.

The REG Procedure
Model: Stepwise_Method
Dependent Variable: _Fat %Fat

Summary of Stepwise Selection

Step	Variable Entered	Variable Removed	Number Label	Partial Vars In	Model R-Square	R-Square	C(p)	F Value	Pr > F
1	Abdomen		Abdomen	1	0.6785	0.6785	37.6024	101.29	<.0001
2	Weight		Weight	2	0.1227	0.8011	7.7062	28.99	<.0001
3	Thigh		Thigh	3	0.0267	0.8278	2.7708	7.13	0.0105

1e.

The REG Procedure
Model: All_Method
Dependent Variable: _Fat

R-Square Selection Method

Number of Observations Read 50
Number of Observations Used 50

Number in Model	R-Square	Variables in Model
1	0.6785	Abdomen
1	0.5220	Chest
1	0.4797	Hip
1	0.4654	Thigh
1	0.3742	Weight
1	0.2677	Age
1	0.0710	Height
2	0.8011	Weight Abdomen
2	0.7401	Abdomen Hip
2	0.7284	Height Abdomen
2	0.7076	Age Abdomen
2	0.7039	Chest Abdomen
2	0.6911	Abdomen Thigh
2	0.6079	Age Thigh
2	0.5983	Height Chest
2	0.5924	Age Chest
2	0.5796	Age Hip
2	0.5365	Chest Thigh
2	0.5355	Weight Chest
2	0.5350	Height Hip
2	0.5289	Chest Hip
2	0.5238	Height Thigh
2	0.5149	Weight Hip
2	0.5099	Age Weight
2	0.4886	Hip Thigh
2	0.4865	Weight Height
2	0.4717	Weight Thigh
2	0.2842	Age Height
3	0.8278	Weight Abdomen Thigh

3	0.8101	Weight Height Abdomen
3	0.8027	Age Weight Abdomen
3	0.8021	Weight Chest Abdomen
3	0.8012	Weight Abdomen Hip
3	0.7888	Height Abdomen Hip
3	0.7521	Chest Abdomen Hip
3	0.7485	Age Abdomen Hip
3	0.7442	Abdomen Hip Thigh

The REG Procedure
Model: All_Method
Dependent Variable: _Fat

R-Square Selection Method

Number in Model	R-Square	Variables in Model
3	0.7427	Height Chest Abdomen
3	0.7410	Age Height Abdomen
3	0.7399	Height Abdomen Thigh
3	0.7265	Age Chest Abdomen
3	0.7123	Chest Abdomen Thigh
3	0.7095	Age Abdomen Thigh
3	0.6346	Age Height Chest
3	0.6300	Age Weight Thigh
3	0.6284	Age Height Thigh
3	0.6260	Weight Chest Thigh
3	0.6259	Age Chest Thigh
3	0.6089	Age Hip Thigh
3	0.6073	Height Chest Thigh
3	0.6047	Weight Chest Hip
3	0.6033	Age Height Hip
3	0.6030	Age Chest Hip
3	0.6011	Weight Height Chest
3	0.6010	Age Weight Hip
3	0.6003	Height Chest Hip
3	0.5963	Age Weight Chest
3	0.5626	Age Weight Height
3	0.5472	Weight Hip Thigh
3	0.5447	Height Hip Thigh
3	0.5401	Weight Height Hip
3	0.5365	Chest Hip Thigh
3	0.5243	Weight Height Thigh
4	0.8347	Age Weight Abdomen Thigh
4	0.8302	Weight Abdomen Hip Thigh
4	0.8295	Weight Height Abdomen Thigh
4	0.8278	Weight Chest Abdomen Thigh
4	0.8115	Weight Height Abdomen Hip
4	0.8108	Weight Height Chest Abdomen
4	0.8107	Age Weight Height Abdomen
4	0.8036	Age Weight Chest Abdomen
4	0.8028	Age Weight Abdomen Hip
4	0.8021	Weight Chest Abdomen Hip
4	0.7935	Height Chest Abdomen Hip
4	0.7934	Height Abdomen Hip Thigh
4	0.7895	Age Height Abdomen Hip
4	0.7591	Age Chest Abdomen Hip
4	0.7574	Age Abdomen Hip Thigh
4	0.7561	Chest Abdomen Hip Thigh
4	0.7531	Age Height Chest Abdomen

The REG Procedure
Model: All_Method
Dependent Variable: _Fat

R-Square Selection Method

Number in Model	R-Square	Variables in Model
4	0.7512	Height Chest Abdomen Thigh
4	0.7451	Age Height Abdomen Thigh
4	0.7275	Age Chest Abdomen Thigh
4	0.7044	Age Weight Chest Thigh
4	0.6594	Age Weight Hip Thigh
4	0.6570	Age Height Chest Thigh
4	0.6510	Age Weight Chest Hip
4	0.6500	Weight Chest Hip Thigh
4	0.6477	Weight Height Chest Thigh
4	0.6393	Age Height Chest Hip
4	0.6366	Age Weight Height Thigh
4	0.6352	Age Weight Height Chest
4	0.6301	Age Height Hip Thigh
4	0.6281	Age Chest Hip Thigh
4	0.6250	Weight Height Chest Hip
4	0.6091	Age Weight Height Hip
4	0.6086	Height Chest Hip Thigh
4	0.5612	Weight Height Hip Thigh
5	0.8369	Age Weight Abdomen Hip Thigh
5	0.8351	Age Weight Height Abdomen Thigh
5	0.8347	Age Weight Chest Abdomen Thigh
5	0.8340	Weight Height Abdomen Hip Thigh
5	0.8302	Weight Chest Abdomen Hip Thigh
5	0.8295	Weight Height Chest Abdomen Thigh
5	0.8123	Weight Height Chest Abdomen Hip
5	0.8118	Age Weight Height Abdomen Hip
5	0.8114	Age Weight Height Chest Abdomen
5	0.8037	Age Weight Chest Abdomen Hip
5	0.7980	Height Chest Abdomen Hip Thigh
5	0.7959	Age Height Abdomen Hip Thigh
5	0.7942	Age Height Chest Abdomen Hip
5	0.7676	Age Chest Abdomen Hip Thigh
5	0.7560	Age Height Chest Abdomen Thigh
5	0.7154	Age Weight Chest Hip Thigh
5	0.7074	Age Weight Height Chest Thigh
5	0.6604	Age Height Chest Hip Thigh
5	0.6598	Age Weight Height Chest Hip
5	0.6596	Age Weight Height Hip Thigh
5	0.6585	Weight Height Chest Hip Thigh
6	0.8385	Age Weight Height Abdomen Hip Thigh
6	0.8369	Age Weight Chest Abdomen Hip Thigh
6	0.8351	Age Weight Height Chest Abdomen Thigh

The REG Procedure
Model: All_Method
Dependent Variable: _Fat

R-Square Selection Method

Number in Model	R-Square	Variables in Model
6	0.8341	Weight Height Chest Abdomen Hip Thigh
6	0.8127	Age Weight Height Chest Abdomen Hip
6	0.8004	Age Height Chest Abdomen Hip Thigh
6	0.7157	Age Weight Height Chest Hip Thigh
7	0.8385	Age Weight Height Chest Abdomen Hip Thigh

1f. Even though the R-square selection method shows that by using all seven variables you obtain an R-square value of 0.8385, by using the Stepwise method you get a three variable model with an R-square value of 0.8278. The method of using only weight and abdomen and thigh measurements to predict body fat percentage is more economical than attempting to use all seven variables, and you only gain about 1% when using all variables, so the cost of money and time outweigh the benefits when compared to the three factor model.

2a.

The FREQ Procedure

Table of EmotionKind by Severity

EmotionKind(EmotionKind) Severity(Severity)

Frequency ,
Percent ,
Row Pct ,
Col Pct ,A little,Extreme ,Moderate,Quite a , Total
, , , ,bit ,

Anger	166	110	101	81	458
	10.45	6.92	6.36	5.10	28.82
	36.24	24.02	22.05	17.69	
	24.27	39.57	28.06	30.34	
Hostility	151	55	70	55	331
	9.50	3.46	4.41	3.46	20.83
	45.62	16.62	21.15	16.62	
	22.08	19.78	19.44	20.60	
Irritability	367	113	189	131	800
	23.10	7.11	11.89	8.24	50.35
	45.88	14.13	23.63	16.38	
	53.65	40.65	52.50	49.06	
Total	684	278	360	267	1589
	43.05	17.50	22.66	16.80	100.00

2b.

The FREQ Procedure

Table of EmotionKind by Severity

EmotionKind(EmotionKind) Severity(Severity)

Frequency , Percent , Row Pct , Col Pct	A little	Extreme	Moderate	Quite a bit	Total
Anger	166 10.45 36.24 24.27	110 6.92 24.02 39.57	101 6.36 22.05 28.06	81 5.10 17.69 30.34	458 28.82
Hostility	151 9.50 45.62 22.08	55 3.46 16.62 19.78	70 4.41 21.15 19.44	55 3.46 16.62 20.60	331 20.83
Irritability	367 23.10 45.88 53.65	113 7.11 14.13 40.65	189 11.89 23.63 52.50	131 8.24 16.38 49.06	800 50.35
Total	684 43.05	278 17.50	360 22.66	267 16.80	1589 100.00

Statistics for Table of EmotionKind by Severity

Statistic	DF	Value	Prob
Chi-Square	6	24.4386	0.0004
Likelihood Ratio Chi-Square	6	23.8800	0.0005
Mantel-Haenszel Chi-Square	1	2.1788	0.1399
Phi Coefficient		0.1240	
Contingency Coefficient		0.1231	
Cramer's V		0.0877	

Sample Size = 1589

We can conclude that there is a relationship between severity and emotion kind, since the p-value for the Chi-Square test is less than 0.05 (p=0.0004).