

```

(e)
data table18;
input income $ happiness $ count @@;
datalines;
above not_too_happy 21 above pretty_happy 159 above very_happy 110
average not_too_happy 53 average pretty_happy 372 average very_happy 221
below not_too_happy 94 below pretty_happy 249 below very_happy 83
;
proc freq data = table18 order = data;
weight count;
tables income * happiness / norow nocol nopercnt chisq expected cmh score = rank;
run;

```

#### The FREQ Procedure

Frequency Expected	Table of income by happiness			
	happiness			
	income	not_too_	pretty_h	very_hap
				Total
	above	21 35.771	159 166.08	110 88.15
	average	53 79.683	372 369.96	221 196.36
	below	94 52.546	249 243.96	83 129.49
	Total	168	780	414
				1362

#### Statistics for Table of income by happiness

Statistic	DF	Value	Prob
Chi-Square	4	73.3525	<.0001
Likelihood Ratio Chi-Square	4	71.3045	<.0001
MH Chi-Square (Rank Scores)	1	55.6873	<.0001
Phi Coefficient		0.2321	
Contingency Coefficient		0.2261	
Cramer's V		0.1641	

Sample Size = 1362

#### Summary Statistics for income by happiness

Cochran-Mantel-Haenszel Statistics (Based on Rank Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	55.6873	<.0001
2	Row Mean Scores Differ	2	64.6145	<.0001
3	General Association	4	73.2986	<.0001

(f)

```
proc freq data = table18 order = data;  
weight count;  
tables income * happiness/ norow nocol nopercnt chisq expected cmh2;  
run;
```

#### The FREQ Procedure

Frequency Expected	Table of income by happiness			
	income	happiness		
		not_too_	pretty_h	very_hap
				Total
	above	21 35.771	159 166.08	110 88.15
	average	53 79.683	372 369.96	221 196.36
	below	94 52.546	249 243.96	83 129.49
	Total	168	780	414
				1362

#### Statistics for Table of income by happiness

Statistic	DF	Value	Prob
Chi-Square	4	73.3525	<.0001
Likelihood Ratio Chi-Square	4	71.3045	<.0001
Mantel-Haenszel Chi-Square	1	55.9258	<.0001
Phi Coefficient		0.2321	
Contingency Coefficient		0.2261	
Cramer's V		0.1641	

Sample Size = 1362

#### Summary Statistics for income by happiness

Cochran-Mantel-Haenszel Statistics (Based on Table Scores)				
Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	55.9258	<.0001
2	Row Mean Scores Differ	2	67.9946	<.0001