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REPORT

On

T TESTS AND CHI SQUARE TEST

Submitted by

EKANSH BARI

Registration No 11615973

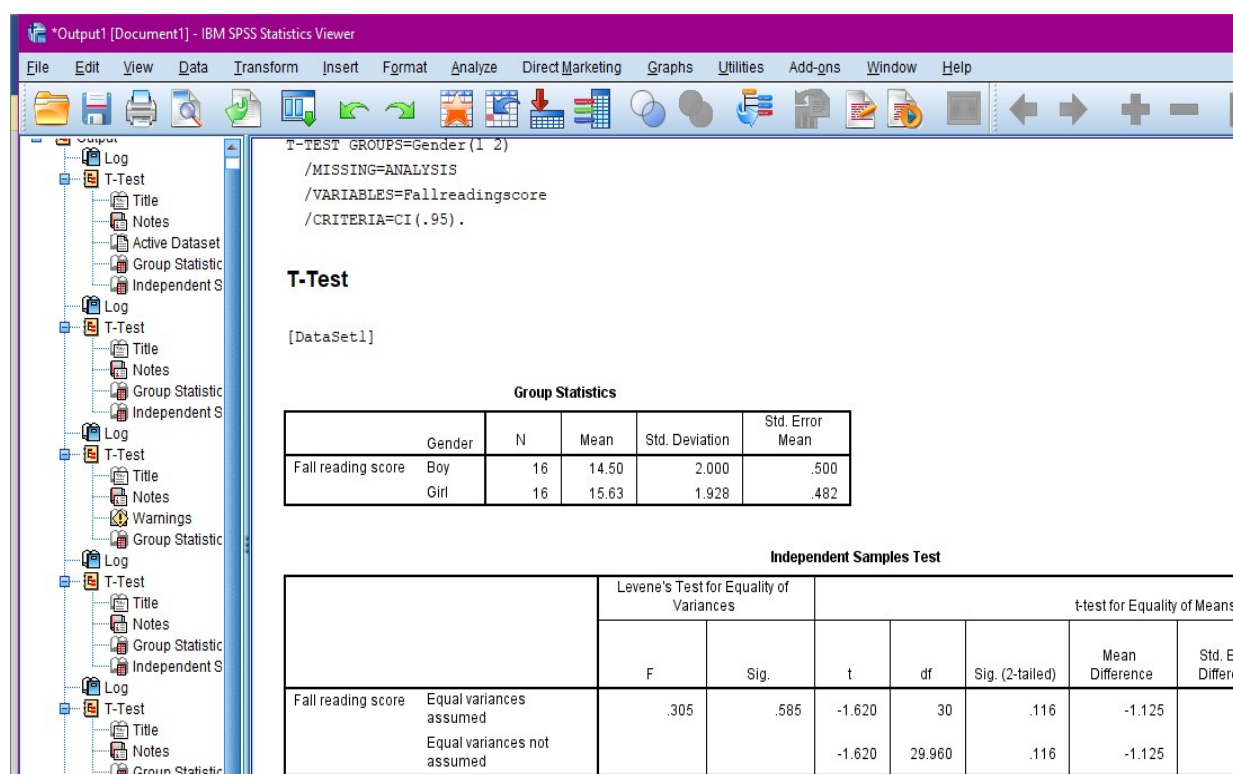
(MGN909) Section KOE11 - A22

Programme Name: B.Tech Computer Science

**School of Computer Science & Engineering
Lovely Professional University, Phagwara**

Assignment – T TESTS AND CHI SQUARE TEST

1. Is there a significant difference between boys' and girls' fall reading scores?



Mean score of boys = 14.50, SD = 2.00

Mean score of girls = 15.63, SD = 1.92

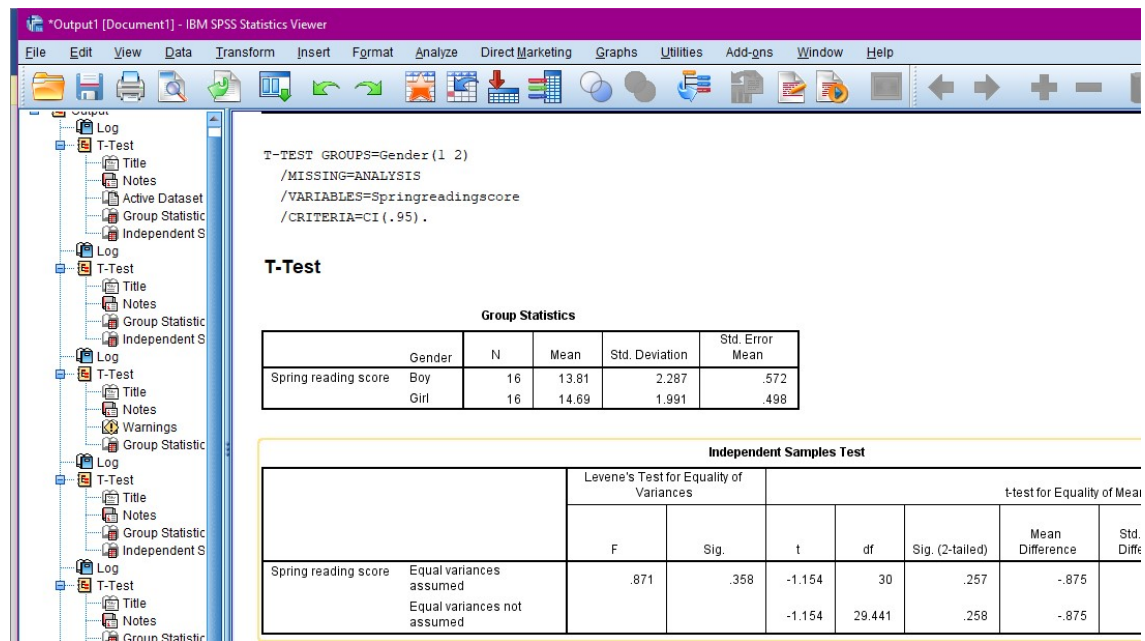
$t = -1.620$, $df = 30$, $p = .116$

The significance (p) of the Levene test — the number in the second column — is high (greater than 0.05 or so), the values in the first row are applicable means here row one is valid.

The significance of the T test — that is, the two-tailed significance — .116 is greater than the .05 that means Null Hypothesis is accepted and there is no significant difference in the two means.

Conclusion: so here in this scenario there is no significant difference between boys and girls in the fall reading scores.

2. Is there a significant difference between boys' and girls' spring reading scores?



Mean score of boys = 13.81, SD = 2.287

Mean score of girls = 14.69, SD = 1.991

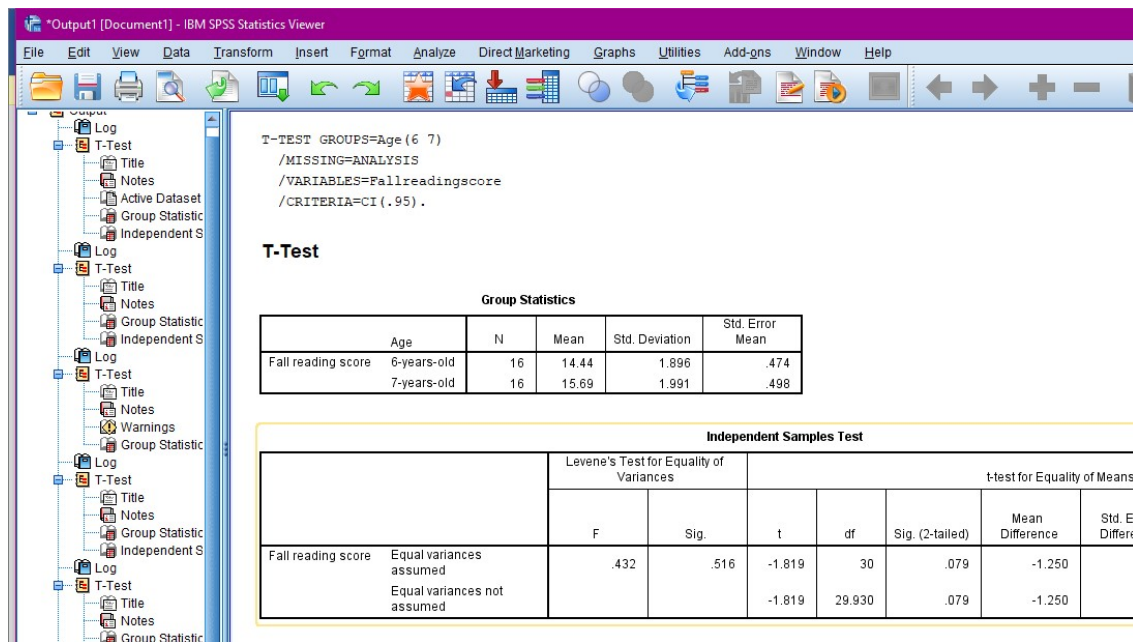
$t = -1.154$, $df = 30$, $p = .257$

The significance (p) of the Levene test — the number in the second column — is high (greater than 0.05 or so), the values in the first row are applicable means here row one is valid.

The significance of the T test — that is, the two-tailed significance — .257 is greater than the .05 that means Null Hypothesis is accepted and there is no significant difference in the two means.

Conclusion: so here in this scenario there is no significant difference between boys and girls in the spring reading scores.

3. Is there a significant difference between 6-year-olds' and 7-year-olds' fall reading scores?



Mean score of 6-years-old = 14.44, SD = 1.896

Mean score of 7-years-old = 15.69, SD = 1.991

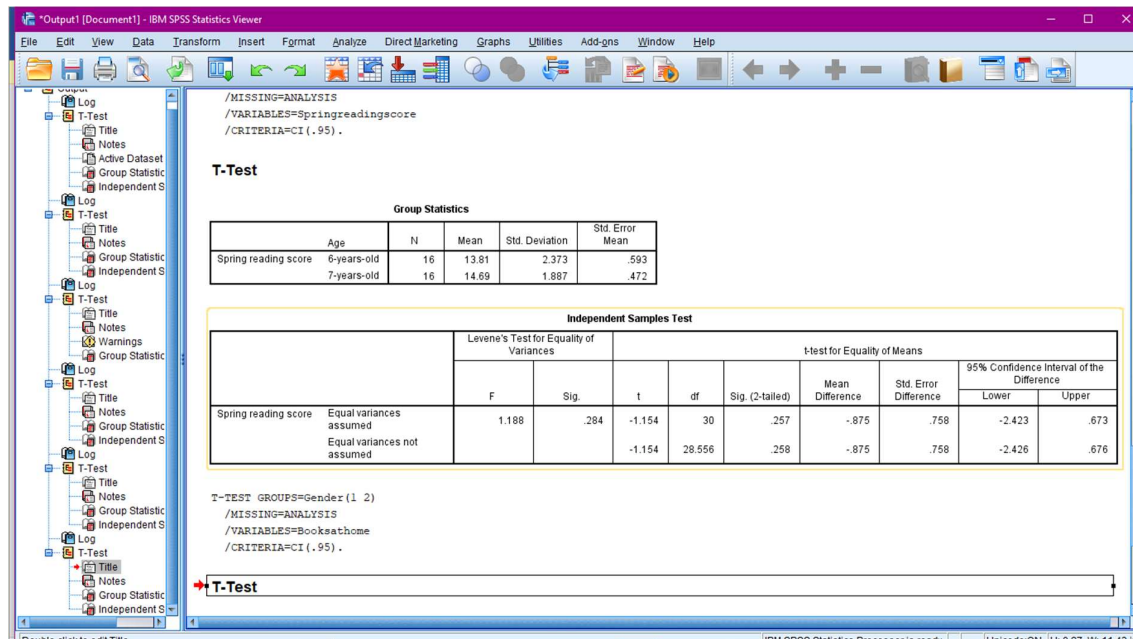
$t = -1.819$, $df = 30$, $p = .079$

The significance (p) of the Levene test — the number in the second column — is high (greater than 0.05 or so), the values in the first row are applicable means here row one is valid.

The significance of the T test — that is, the two-tailed significance — .079 is greater than the .05 that means Null Hypothesis is accepted and there is no significant difference in the two means.

Conclusion: so here in this scenario there is no significant difference between 6-years-old and 7-years-old in the fall reading scores.

4. Is there a significant difference between 6-year-olds' and 7-year-olds' spring reading scores?



Mean score of 6-years-old = 13.81, SD = 2.373

Mean score of 7-years-old = 14.69, SD = 1.887

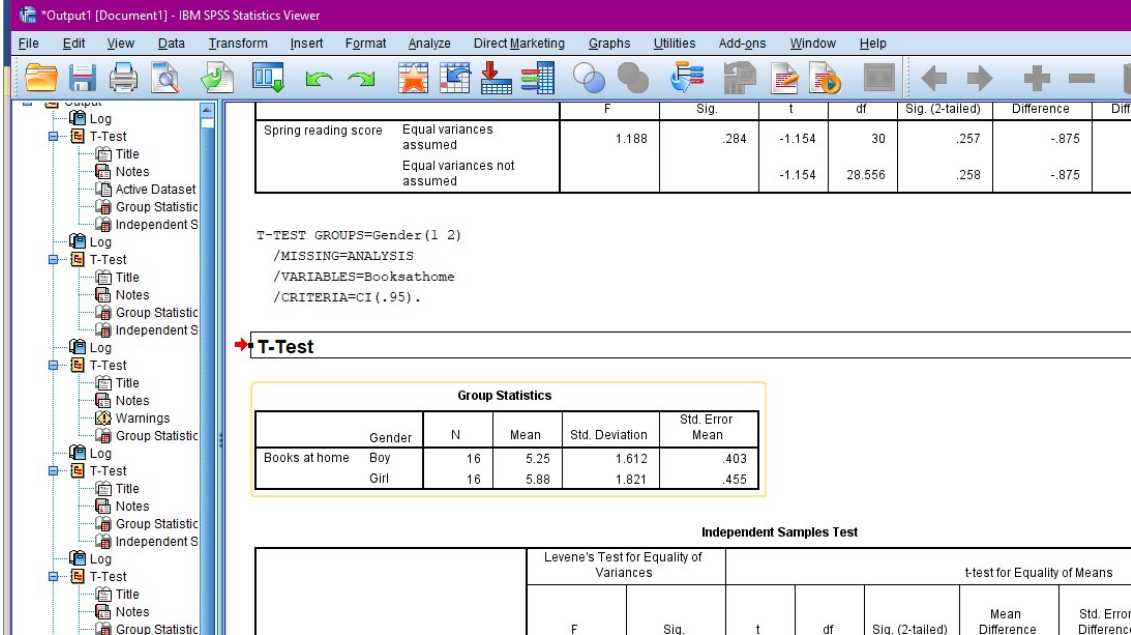
$t = -1.154$, $df = 30$, $p = .257$

The significance (p) of the Levene test — the number in the second column — is high (greater than 0.05 or so), the values in the first row are applicable means here row one is valid.

The significance of the T test — that is, the two-tailed significance — .257 is greater than the .05 that means Null Hypothesis is accepted and there is no significant difference in the two means.

Conclusion: so here in this scenario there is no significant difference between 6-years-old and 7-years-old in the spring reading scores.

5. Is there a significant difference between boys and girls with respect to the number of books in the home?



The screenshot shows the IBM SPSS Statistics Viewer interface. The left pane displays a tree view of the output, with 'T-Test' selected. The main window shows the following tables:

		F	Sig.	t	df	Sig. (2-tailed)	Difference	Difference
Spring reading score	Equal variances assumed	1.188	.284	-1.154	30	.257	-.875	
	Equal variances not assumed			-1.154	28.556	.258	-.875	

T-TEST GROUPS=Gender (1 2)
 /MISSING=ANALYSIS
 /VARIABLES=Booksathome
 /CRITERIA=CI(.95).

T-Test

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Books at home	Boy	16	5.25	1.612	.403
	Girl	16	5.88	1.821	.455

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference

Mean of books at home of boys = 5.25, SD = 1.612

Mean of books at home of girls = 5.88, SD = 1.821

$t = -1.028$, $df = 30$, $p = .312$

The significance (p) of the Levene test — the number in the second column — is high (greater than 0.05 or so), the values in the first row are applicable means here row one is valid.

The significance of the T test — that is, the two-tailed significance — .312 is greater than the .05 that means Null Hypothesis is accepted and there is no significant difference in the two means.

Conclusion: so here in this scenario there is no significant difference between boys and girls who have books at home.

6. Is there any association between gender and flavour of an ice-cream is statistically significant or not?

IBM SPSS Statistics Viewer

File Edit View Data Transform Insert Format Analyze Direct Marketing Graphs Utilities Add-ons Window Help

Log Crosstabs Symmetri

Crosstabs

[DataSet6]

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender * Cherry	2	66.7%	1	33.3%	3	100.0%
Gender * Lemon	2	66.7%	1	33.3%	3	100.0%
Gender * Strawberry	2	66.7%	1	33.3%	3	100.0%
Gender * Other	2	66.7%	1	33.3%	3	100.0%

Gender * Cherry

Crosstab

Count

IBM SPSS Statistics Viewer

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Log Crosstabs Symmetri

Chi-Square Tests

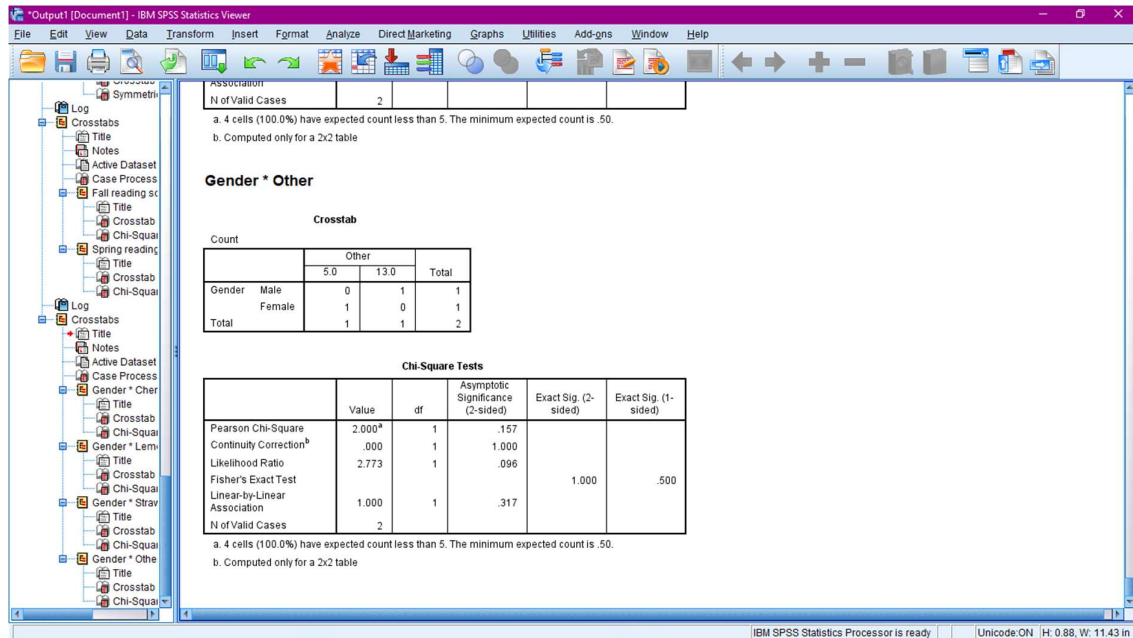
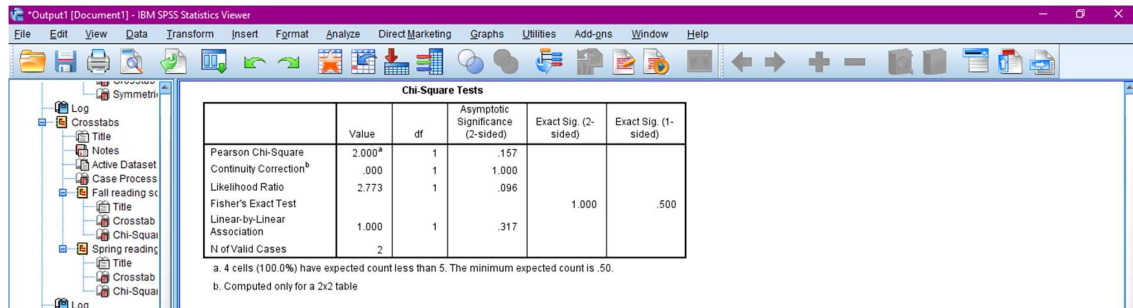
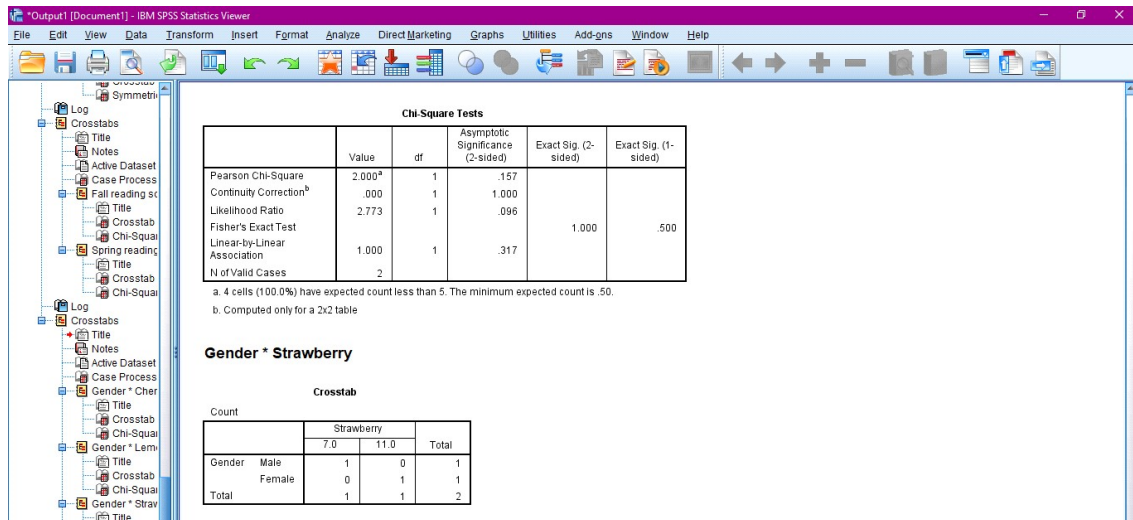
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.000 ^a	1	.157		
Continuity Correction ^b	.000	1	1.000		
Likelihood Ratio	2.773	1	.096		
Fisher's Exact Test				1.000	.500
Linear-by-Linear Association	1.000	1	.317		
N of Valid Cases	2				

a. 4 cells (100.0%) have expected count less than 5. The minimum expected count is .50.
b. Computed only for a 2x2 table

Gender * Lemon

Crosstab

Count



Here we have categorical data and so to find association we are going to apply Chi Square Test

a) In all the scenario i.e. between gender*cherry, gender*lemon, gender*strawberry, gender*other

We have the same values of p, D.O.F, Chi square value so the result or interpretation is going to be same for all the above four mentioned scenarios

$P = 0.157$, $D.O.F = 1$, $CHI\ SQUARE\ CALCULATED\ VALUE = 2.000$

Here the value of p i.e. 0.157 is greater than the 0.05 (5% significance level) that means our result is statistically not significant and we will accept the Null hypothesis that says there is no significant association among the data sample, that means our variables are independent of each other.

7. State the appropriate conclusion for a chi-square test for goodness of fit for the given information

a) $P = 0.10$, $D.O.F = 8$, $CHI\ SQUARE\ CALCULATED\ VALUE = 13.219$

Here the value of p i.e. 0.10 is greater than the 0.05 (5% significance level) that means our result is statistically not significant and we will accept the Null hypothesis that says there is no significant association among the data sample, that means our variables is independent of each other.

b) $P = 0.025$, $D.O.F = 17$, $CHI\ SQUARE\ CALCULATED\ VALUE = 27.008$

Here the value of p i.e. 0.025 is less than the 0.05 (5% significance level) that means our result is statistically significant and we will accept the Alternate hypothesis that says there is a significant association among the data sample, that means our variables is dependent on each other.

8. Is the association between fall reading scores and spring reading scores with number of books is statistically significant?

IBM SPSS Statistics Viewer

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Log Crosstabs Symmetri

→ **Crosstabs**

[DataSet1]

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Fall reading score *						
Books at home	32	100.0%	0	0.0%	32	100.0%
Spring reading score *						
Books at home	32	100.0%	0	0.0%	32	100.0%

Fall reading score * Books at home

Crosstab

Count

		Books at home							Total
		3	4	5	6	7	8	9	
Fall reading score	12	1	1	2	0	1	0	0	5
	13	0	0	0	0	1	0	0	1
	14	1	0	1	1	3	1	0	7
	15	1	1	1	4	1	0	0	8

IBM SPSS Statistics Viewer

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Log Crosstabs Symmetri

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	44.778 ^a	36	.150
Likelihood Ratio	43.042	36	.195
Linear-by-Linear Association	.009	1	.923

Spring reading score * Books at home

Crosstab

Count		Books at home							Total
		3	4	5	6	7	8	9	
Spring reading score	11	1	0	0	2	0	0	0	3
	12	0	0	3	2	0	0	1	6
	13	1	0	0	1	1	0	0	3
	14	1	1	0	1	2	1	0	6
	15	0	1	2	0	1	0	1	5
	16	0	2	0	0	1	0	0	3
	17	0	2	0	0	1	0	0	3
Total	18	1	0	1	0	0	1	0	3
Total		4	6	6	6	6	2	2	32

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	44.711 ^a	42	.359
Likelihood Ratio	50.339	42	.177
Linear-by-Linear Association	.169	1	.681

Here we have categorical data and to find association we are going to apply Chi Square Test

a) In the first scenario i.e. between fall reading score*books at home

Chi square value = 44.778, df = 36 and p = .150

Here the value of p i.e. 0.150 is greater than the 0.05 (5% significance level) that means our result is statistically not significant and we will accept the Null hypothesis that says there is no significant association among the data sample, that means our two categorical variables are independent of each other.

b) In the second scenario i.e. between spring reading score*books at home

Chi square value = 44.711, df = 42 and p = .359

Here the value of p i.e. 0.359 is greater than the 0.05 (5% significance level) that means our result is statistically not significant and we will accept the Null hypothesis that says there is no significant association among the data sample, that means our two categorical variables are independent of each other.