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# MGN909-DATA ANALYSIS USING SPSS

CA-2

Submitted To:

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CA-2

Submitted By:

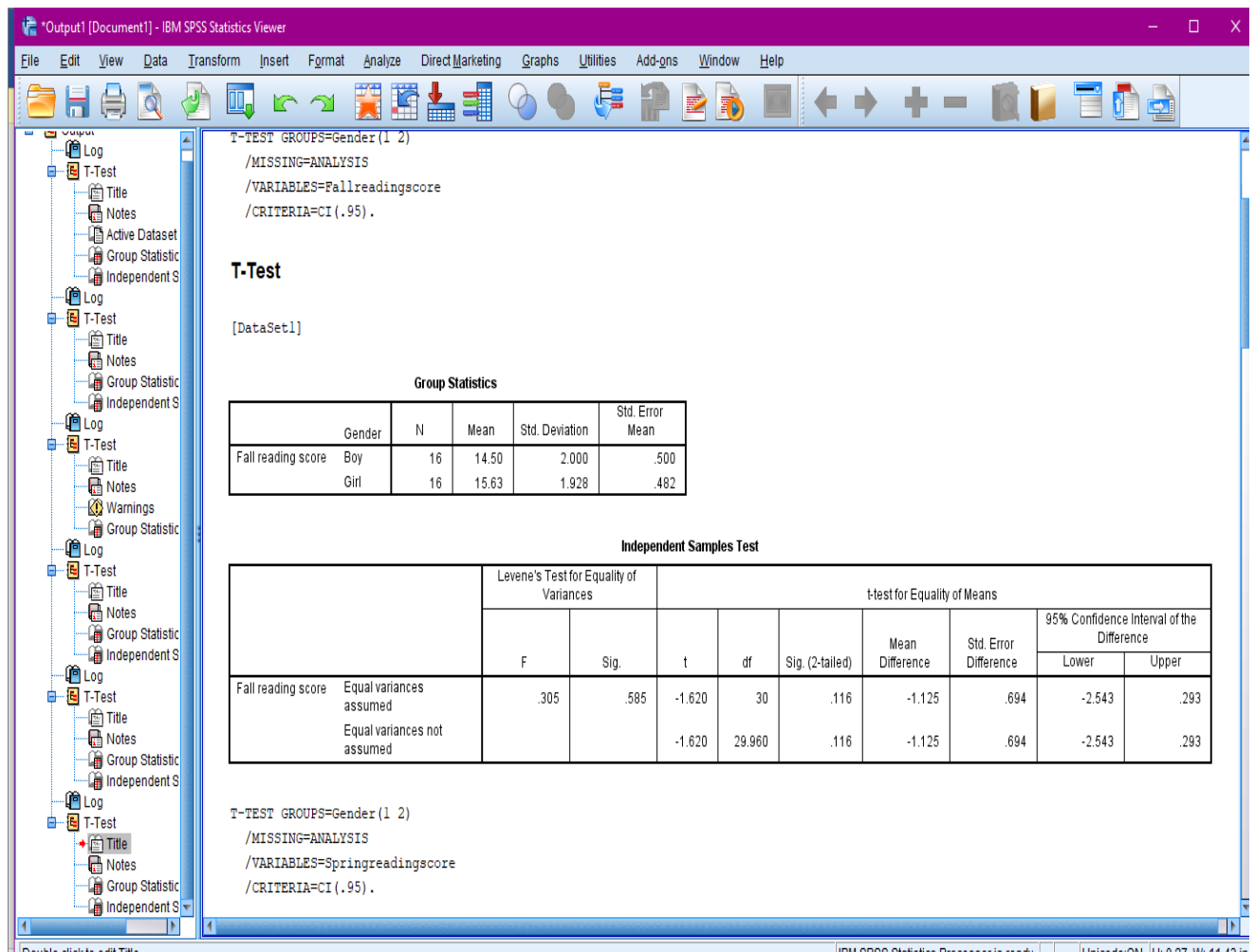
G Ravi Kanth

11616140

KOE12-A10

**Question-1:** Is there a significant difference between boys' and girls' fall reading scores?

**Answer:-**



**Explanation:**

Mean score of boys = 14.5, SD = 2.0

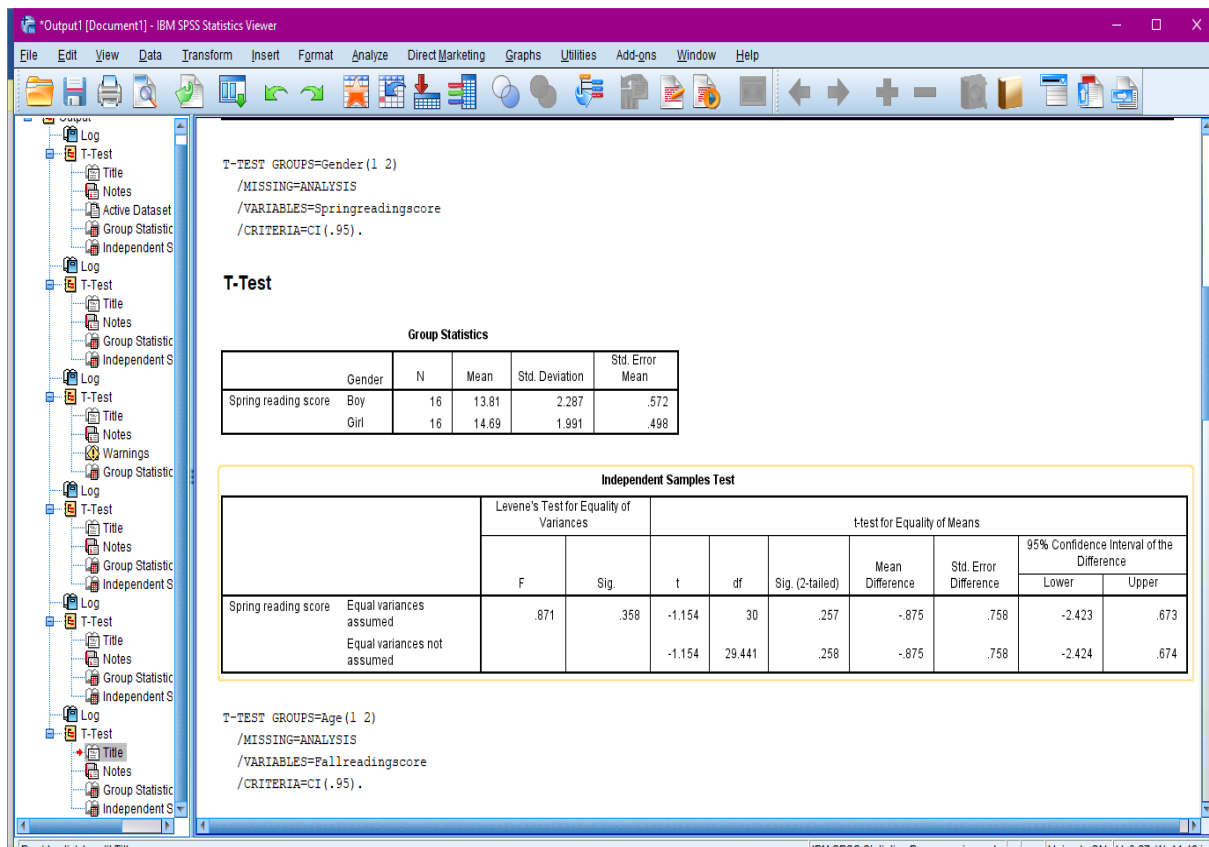
Mean score of girls = 15.6, SD = 1.9

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

The Significance of this test is 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 two-tailed significance 0.116 is greater than the 0.05 that means Null Hypothesis is accepted and there is no significant difference in the two means. So here in this scenario there is no significant difference between boys and girls in the fall reading scores.

**Question-2:** Is there a significant difference between boys' and girls' spring reading scores?

**Answer:-**



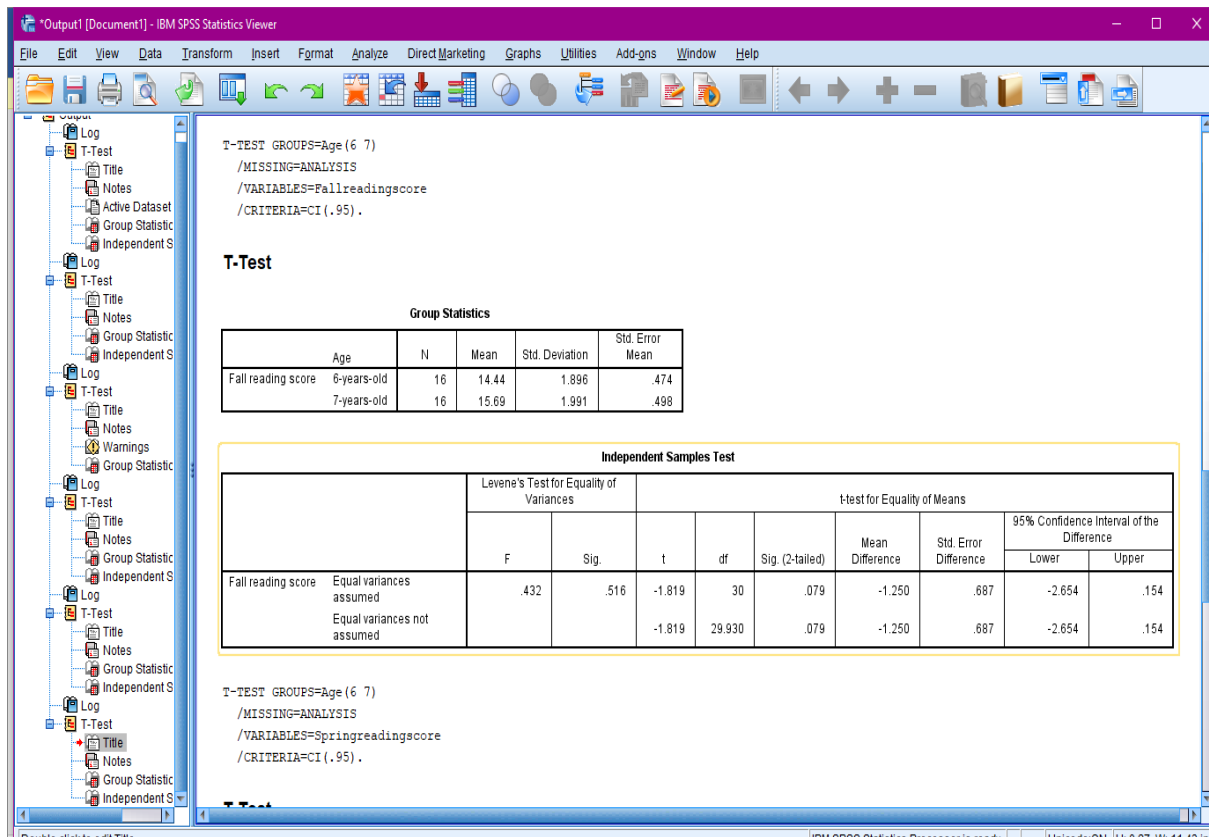
**Explanation:-**

Mean score of boys = 13.8, SD = 2.2  
 Mean score of girls = 14.6, SD = 1.9  
 $t = -1.15$ ,  $df = 30$ ,  $p = .25$

The Significance of this test is the number in the second column. If it is high (greater than 0.05 or so), the values in the first row are applicable. Here, row one is valid. The significance of the T test, that is, the two-tailed significance 0.257, is greater than the 0.05, which means the Null Hypothesis is accepted and there is no significant difference in the two means. So here, in this scenario, there is no significant difference between boys and girls in the spring reading scores.

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

**Answer:-**



The screenshot displays the IBM SPSS Statistics Viewer interface. The main window shows the output of a T-Test. The syntax at the top indicates the test is for 'Age (6 7)' with 'Fallreadingscore' as the variable and a significance level of .95. The output is divided into two sections: 'T-Test' and 'Independent Samples Test'.

**T-Test**

Group Statistics

	Age	N	Mean	Std. Deviation	Std. Error Mean
Fall reading score	6-years-old	16	14.44	1.896	.474
	7-years-old	16	15.69	1.991	.498

**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	95% Confidence Interval of the Difference	
									Lower	Upper
Fall reading score	Equal variances assumed	.432	.516	-1.819	30	.079	-1.250	.687	-2.654	.154
	Equal variances not assumed			-1.819	29.930	.079	-1.250	.687	-2.654	.154

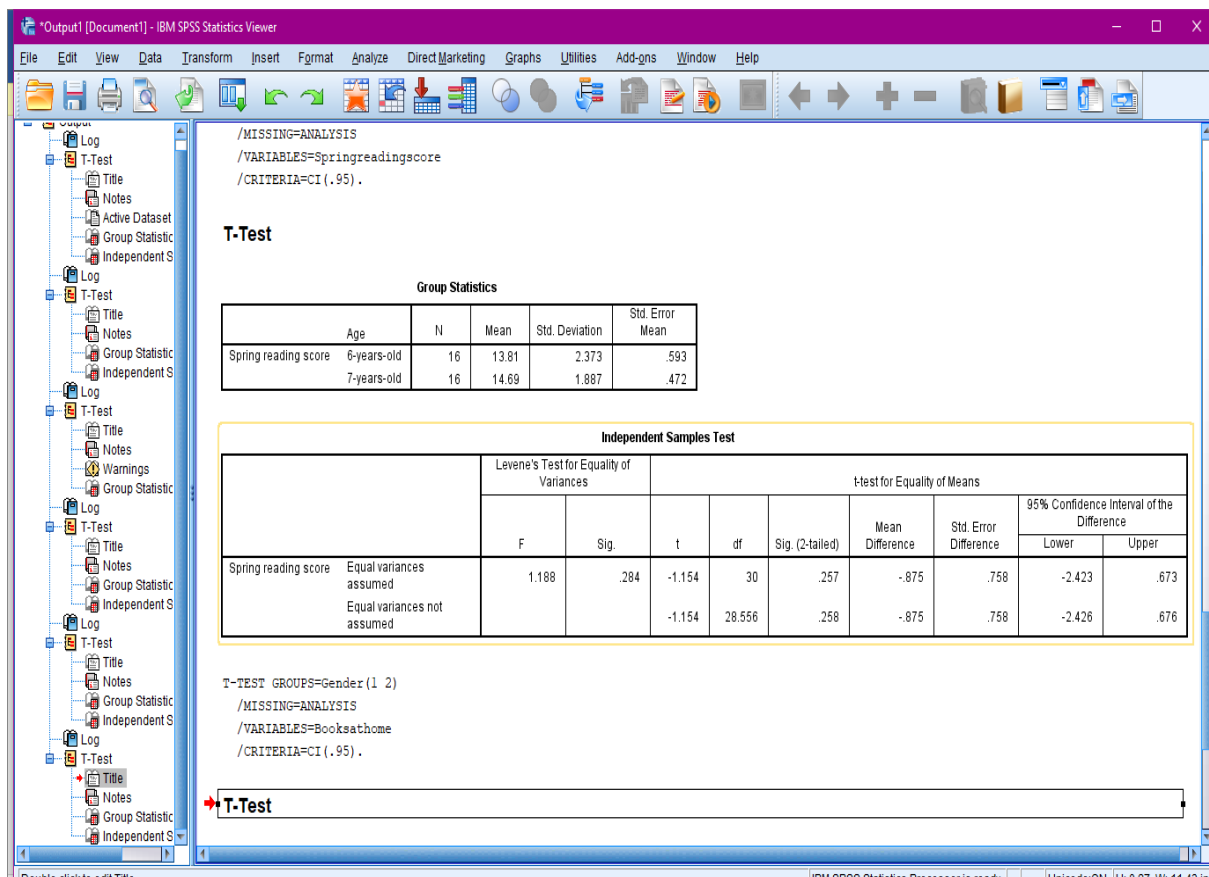
The bottom section of the output shows the syntax for a T-Test for 'Springreadingscore', which is not the focus of this question.

**Explanation:-**

The significance of this T-test is the two-tailed significance 0.079, which is greater than the 0.05 level. This means the Null Hypothesis is accepted, and there is no significant difference in the two means. So, in this scenario, there is no significant difference between 6-year-olds and 7-year-olds in their fall reading scores.

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

**Answer:**

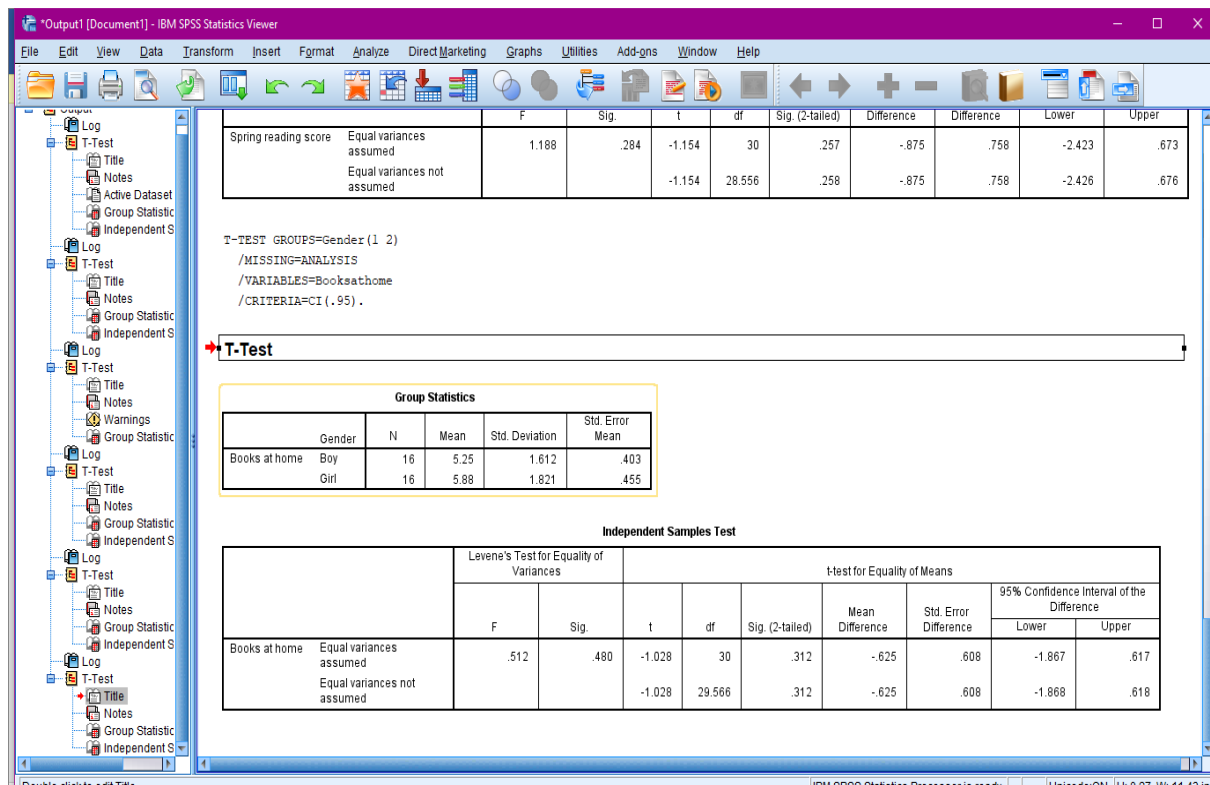


**Explanation:-**

The significance of this test is 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 0.257 is greater than the 0.05 that means Null Hypothesis is accepted and there is no significant difference in the two means. So here in this scenario there is no significant difference between 6-years-old and 7-years-old in the spring reading scores.

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

**Answer:-**



The screenshot displays the IBM SPSS Statistics Viewer interface. The left pane shows a project tree with various objects like Log, T-Test, Title, Notes, Active Dataset, Group Statistics, and Independent Samples. The main window shows the output for a T-Test. At the top, a table compares 'Spring reading score' for 'Equal variances assumed' and 'Equal variances not assumed'. Below this, the T-Test command is listed: 'T-TEST GROUPS=Gender(1 2) /MISSING=ANALYSIS /VARIABLES=Booksathome /CRITERIA=CI(.95)'. A section titled 'T-Test' contains a 'Group Statistics' table for 'Books at home' by gender (Boy and Girl). Below that is the 'Independent Samples Test' table, which includes Levene's Test for Equality of Variances and a t-test for Equality of Means. The t-test results show a two-tailed significance of .312, which is greater than the 0.05 level, indicating no significant difference.

		F	Sig.	t	df	Sig. (2-tailed)	Difference	Difference	Lower	Upper
Spring reading score	Equal variances assumed	1.188	.284	-1.154	30	.257	-.875	.758	-2.423	.673
	Equal variances not assumed			-1.154	28.556	.258	-.875	.758	-2.426	.676

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

**T-Test**

	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

		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	95% Confidence Interval of the Difference	
									Lower	Upper
Books at home	Equal variances assumed	.512	.480	-1.028	30	.312	-.625	.608	-1.867	.617
	Equal variances not assumed			-1.028	29.566	.312	-.625	.608	-1.868	.618

**Explanation:-**

The significance of this test is 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 0.312 is greater than the 0.05 that means Null Hypothesis is accepted and there is no significant difference in the two means. So, Here in this scenario there is no significant difference between boys and girls who have books at home.

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

**Answer:-**

			Cherry		Total
			13	15	
V1	Female	Count	0	1	1
		% within V1	0.0%	100.0%	100.0%
		% within Cherry	0.0%	100.0%	50.0%
		% of Total	0.0%	50.0%	50.0%
	Male	Count	1	0	1
		% within V1	100.0%	0.0%	100.0%
		% within Cherry	100.0%	0.0%	50.0%
		% of Total	50.0%	0.0%	50.0%
Total	Count		1	1	2
	% within V1		50.0%	50.0%	100.0%
	% within Cherry		100.0%	100.0%	100.0%
	% of Total		50.0%	50.0%	100.0%

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	2.000 <sup>a</sup>	1	.157		
Continuity Correction <sup>b</sup>	.000	1	1.000		
Likelihood Ratio	2.773	1	.096		
Fisher's Exact Test				1.000	.500
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

### **Explanation:-**

This result shows that, 0.157 is the Asymptotic Significance result of our Chi-Square Tests on this scenario question.

**Question-7:** State the appropriate conclusion for a chi-square test for goodness of fit for the given information?

### **Answer:-**

- 1)  $P = 0.10$   
 $dof = 8$   
 $\text{Chi-Square} = 13.2$

The Value of  $p$  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.

- 2)  $P = 0.025$   
 $dof = 17$   
 $\text{Chi-Square} = 27.008$

The Value of  $p$  is 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 are dependent on each other.

**Question-8:** Is the association between fall reading scores and spring reading scores with number of books is statistically significant?



**Answer:-**

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Double click to edit Log

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### Fall reading score \* Books at home

Crosstab

		Books at home							
		3	4	5	6	7	8	9	Total
Fall reading score	12	Count	1	1	2	0	1	0	5
		% within Fall reading score	20.0%	20.0%	40.0%	0.0%	20.0%	0.0%	100.0%
		% within Books at home	25.0%	16.7%	33.3%	0.0%	16.7%	0.0%	15.6%
		% of Total	3.1%	3.1%	6.3%	0.0%	3.1%	0.0%	15.6%
		% of Total	0.0%	0.0%	0.0%	0.0%	3.1%	0.0%	3.1%
13	Count	0	0	0	0	1	0	0	1
	% within Fall reading score	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
	% within Books at home	0.0%	0.0%	0.0%	0.0%	16.7%	0.0%	0.0%	3.1%
	% of Total	0.0%	0.0%	0.0%	0.0%	3.1%	0.0%	0.0%	3.1%
	% of Total	0.0%	0.0%	0.0%	0.0%	3.1%	0.0%	0.0%	3.1%
14	Count	1	0	1	1	3	1	0	7
	% within Fall reading score	14.3%	0.0%	14.3%	14.3%	42.9%	14.3%	0.0%	100.0%
	% within Books at home	25.0%	0.0%	16.7%	16.7%	50.0%	50.0%	0.0%	21.9%
	% of Total	3.1%	0.0%	3.1%	3.1%	9.4%	3.1%	0.0%	21.9%
	% of Total	0.0%	0.0%	0.0%	0.0%	3.1%	0.0%	0.0%	3.1%
15	Count	1	1	1	4	1	0	0	8
	% within Fall reading score	12.5%	12.5%	12.5%	50.0%	12.5%	0.0%	0.0%	100.0%
	% within Books at home	25.0%	16.7%	16.7%	66.7%	16.7%	0.0%	0.0%	25.0%
	% of Total	3.1%	3.1%	3.1%	12.5%	3.1%	0.0%	0.0%	25.0%
	% of Total	0.0%	0.0%	66.7%	0.0%	0.0%	0.0%	1	3
16	Count	0	0	2	0	0	0	1	3
	% within Fall reading score	0.0%	0.0%	66.7%	0.0%	0.0%	0.0%	33.3%	100.0%
	% within Books at home	0.0%	0.0%	66.7%	0.0%	0.0%	0.0%	33.3%	100.0%
	% of Total	0.0%	0.0%	6.3%	0.0%	0.0%	0.0%	3.1%	6.3%
	% of Total	0.0%	0.0%	6.3%	0.0%	0.0%	0.0%	3.1%	6.3%

IBM SPSS Statistics Viewer

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Total	% within Books at home	0.0%	66.7%	0.0%	16.7%	0.0%	50.0%	50.0%	21.9%
	% of Total	0.0%	12.5%	0.0%	3.1%	0.0%	3.1%	3.1%	21.9%
	Count	4	6	6	6	6	2	2	32
	% within Fall reading score	12.5%	18.8%	18.8%	18.8%	18.8%	6.3%	6.3%	100.0%
	% within Books at home	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% of Total		12.5%	18.8%	18.8%	18.8%	18.8%	6.3%	6.3%	100.0%

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	44.778 <sup>a</sup>	36	.150
Likelihood Ratio	43.042	36	.195
Linear-by-Linear Association	.009	1	.923
N of Valid Cases	32		

a. 49 cells (100.0%) have expected count less than 5. The minimum expected count is .06.

### Symmetric Measures

	Value	Approximate Significance
Nominal by Nominal Phi	1.183	.150
Cramer's V	.483	.150
N of Valid Cases	32	

