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Point Biserial Correlation
Import data

```
>Warning # 2004.  Command name: SUBTITLE
>The subtitle given exceeds 60 characters in length.  The first 60 characters
>will be used.
```

Point Biserial Correlation Setup
Frequency check for the binary variable and descriptive stat

Frequencies

[PointBiserialData] D:\DATA ANALYSIS\G Correlation Tests\Point Biserial Correlation\SPSS_Output\sav\Point-Biserial-Correlation-data.sav

Statistics

		Binary grouping variable	Sex binary code for point biserial correlation: F=1, M=0
N	Valid	649	649
	Missing	0	0

Frequency Table

Binary grouping variable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	383	59.0	59.0	59.0
	M	266	41.0	41.0	100.0
	Total	649	100.0	100.0	

Sex binary code for point biserial correlation: F=1, M=0

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	M / coded 0	266	41.0	41.0	41.0
	F / coded 1	383	59.0	59.0	100.0
	Total	649	100.0	100.0	

Descriptives

Point Biserial Correlation Setup
Frequency check for the binary variable and descriptive stat

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Final grade / continuous variable	649	0	19	11.91	3.231
Second period grade	649	0	19	11.57	2.914
First period grade	649	0	19	11.40	2.745
absences	649	0	32	3.66	4.641
age	649	15	22	16.74	1.218
Sex binary code for point biserial correlation: F=1, M=0	649	0	1	.59	.492
Valid N (listwise)	649				

Point Biserial Group Descriptives

Point Biserial Group Descriptives
Mean G3 by binary group: M coded 0 and F coded 1

Means

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Final grade / continuous variable * Sex binary code for point biserial correlation: F=1, M=0	649	100.0%	0	0.0%	649	100.0%

Report

Final grade / continuous variable

Sex binary code for point biserial correlation: F=1, M=0	N	Mean	Std. Deviation	Std. Error of Mean	Variance
M / coded 0	266	11.41	3.321	.204	11.027
F / coded 1	383	12.25	3.124	.160	9.760
Total	649	11.91	3.231	.127	10.437

Report

Final grade / continuous variable

Sex binary code for point biserial correlation: F=1, M=0	Minimum	Maximum
M / coded 0	0	19
F / coded 1	0	19
Total	0	19

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```

Explore

Sex binary code for point biserial correlation: F=1, M=0

Case Processing Summary

	Sex binary code for point biserial correlation: F=1, M=0	Cases			
		Valid		Missing	
		N	Percent	N	Percent
Final grade / continuous variable	M / coded 0	266	100.0%	0	0.0%
	F / coded 1	383	100.0%	0	0.0%

Case Processing Summary

	Sex binary code for point biserial correlation: F=1, M=0	Cases	
		Total	
		N	Percent
Final grade / continuous variable	M / coded 0	266	100.0%
	F / coded 1	383	100.0%

Descriptives

	Sex binary code for point biserial correlation: F=1, M=0			Statistic
Final grade / continuous variable	M / coded 0	Mean		11.41
		95% Confidence Interval for Mean	Lower Bound	11.01
			Upper Bound	11.81
		5% Trimmed Mean		11.60
		Median		11.00
		Variance		11.027
		Std. Deviation		3.321
		Minimum		0
		Maximum		19
		Range		19
		Interquartile Range		3
		Skewness		-.980
		Kurtosis		2.803
	F / coded 1	Mean		12.25

Distribution and Assumption Context
Boxplots, histograms, and normality context for G3 by the bi

Descriptives

	Sex binary code for point biserial correlation: F=1, M=0			Std. Error
Final grade / continuous variable	M / coded 0	Mean		.204
		95% Confidence Interval for Mean	Lower Bound	
			Upper Bound	
		5% Trimmed Mean		
		Median		
		Variance		
		Std. Deviation		
		Minimum		
		Maximum		
		Range		
		Interquartile Range		
		Skewness		.149
		Kurtosis		.298
	F / coded 1	Mean		.160

Descriptives

	Sex binary code for point biserial correlation: F=1, M=0		Statistic
	95% Confidence Interval for Mean	Lower Bound	11.94
		Upper Bound	12.57
	5% Trimmed Mean		12.37
	Median		12.00
	Variance		9.760
	Std. Deviation		3.124
	Minimum		0
	Maximum		19
	Range		19
	Interquartile Range		4
	Skewness		-.857
	Kurtosis		2.683

Distribution and Assumption Context
Boxplots, histograms, and normality context for G3 by the bi

Descriptives

Sex binary code for point biserial correlation: F=1, M=0			Std. Error
	95% Confidence Interval for Mean	Lower Bound	
		Upper Bound	
	5% Trimmed Mean		
	Median		
	Variance		
	Std. Deviation		
	Minimum		
	Maximum		
	Range		
	Interquartile Range		
	Skewness		.125
	Kurtosis		.249

Tests of Normality

	Sex binary code for point biserial correlation: F=1, M=0	Kolmogorov-Smirnov[a]			Shapiro-...
		Statistic	df	Sig.	Statistic
Final grade / continuous variable	M / coded 0	.148	266	.000	.913
	F / coded 1	.105	383	.000	.934

Tests of Normality

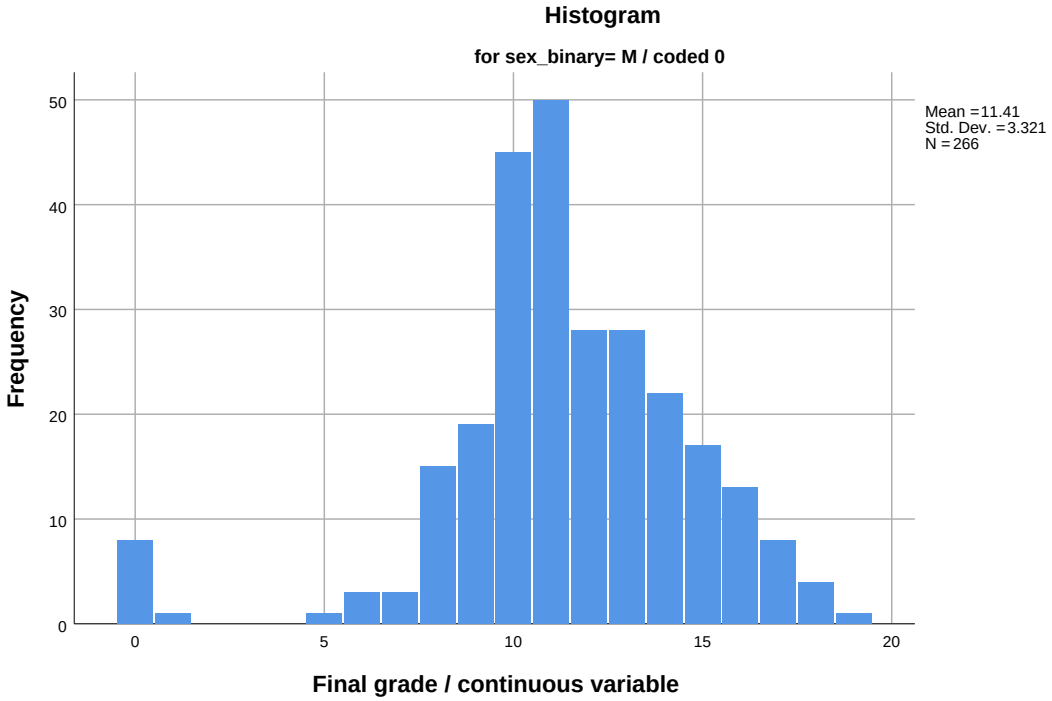
	Sex binary code for point biserial correlation: F=1, M=0	Shapiro-Wilk	
		df	Sig.
Final grade / continuous variable	M / coded 0	266	.000
	F / coded 1	383	.000

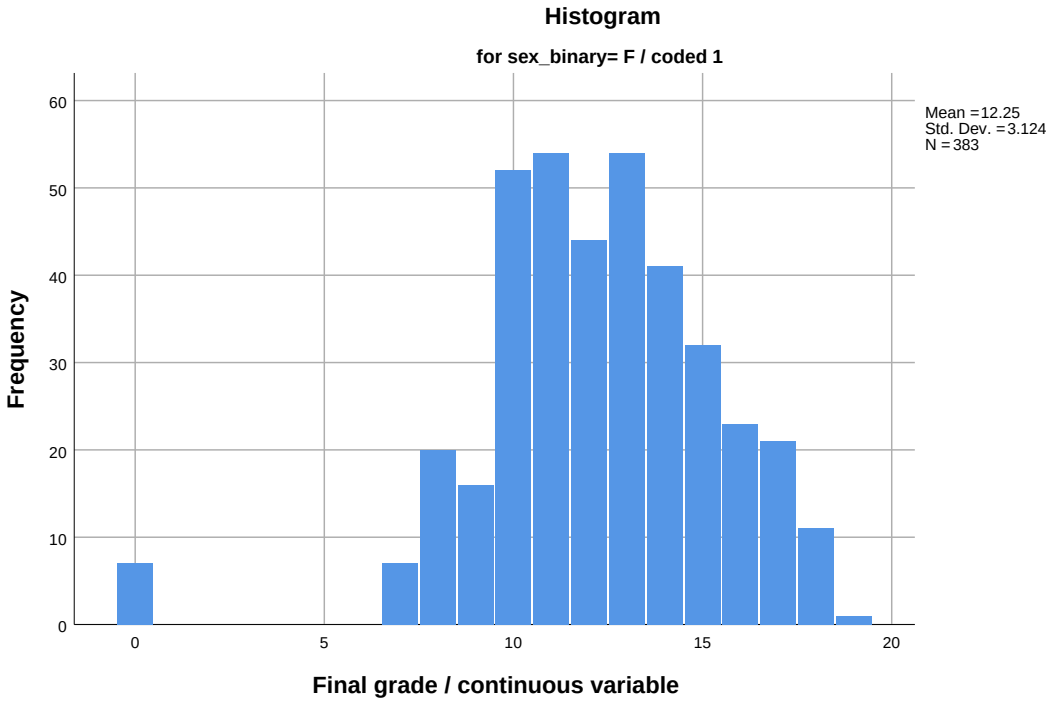
a. Lilliefors Significance Correction

Final grade / continuous variable

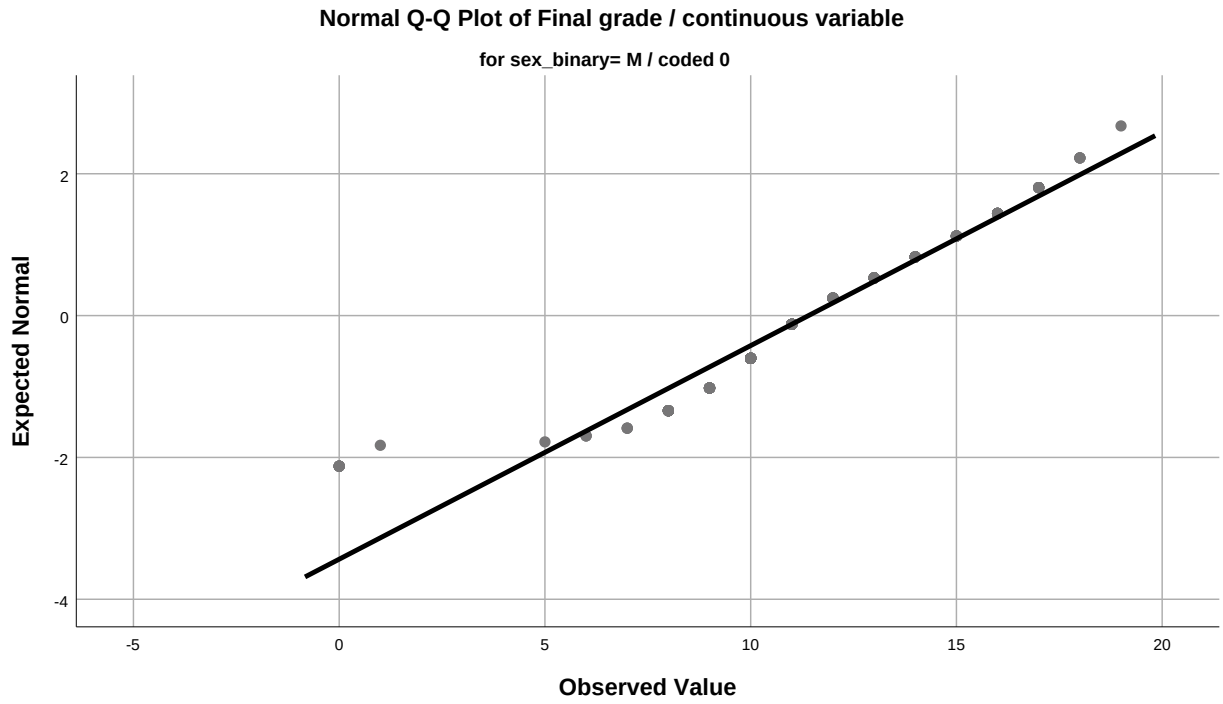
Histograms

Distribution and Assumption Context
Boxplots, histograms, and normality context for G3 by the bi

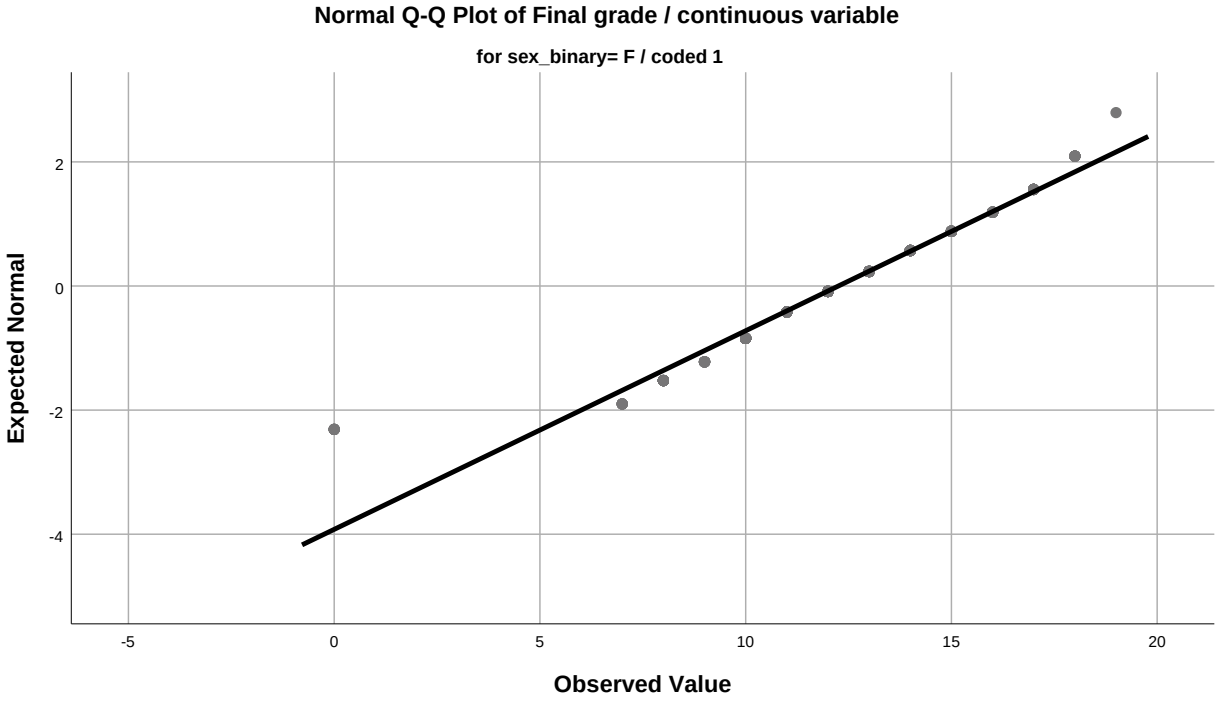




Normal Q-Q Plots

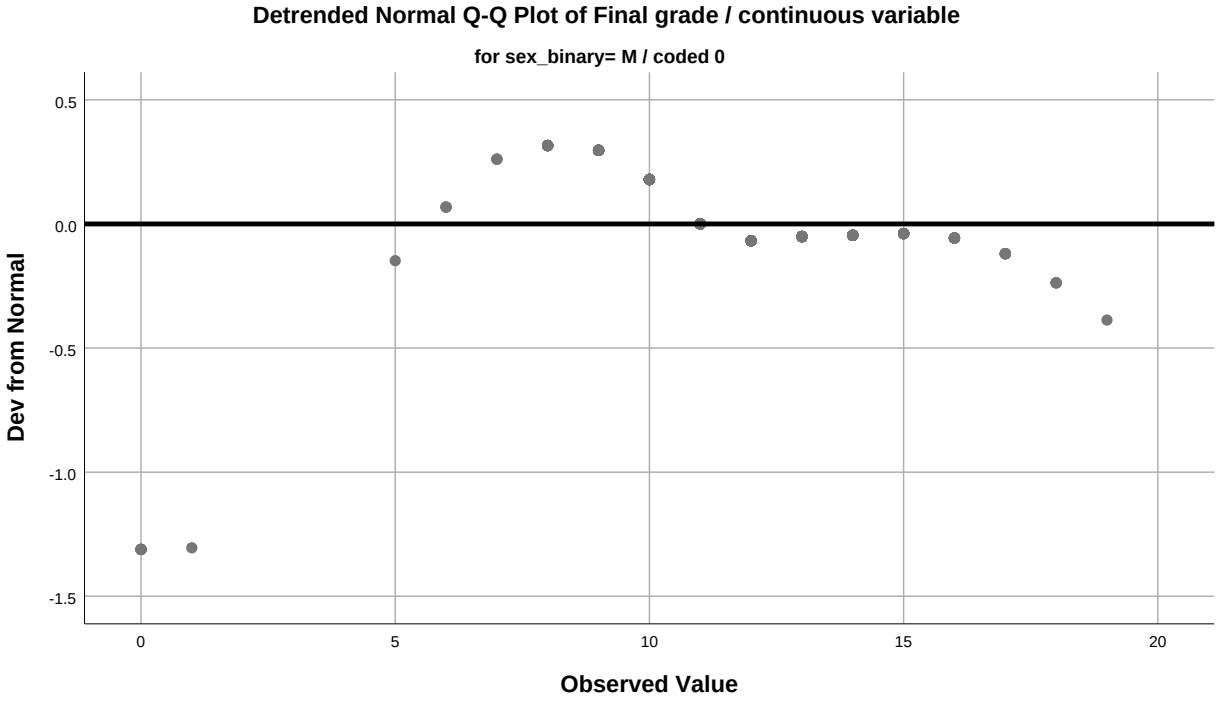


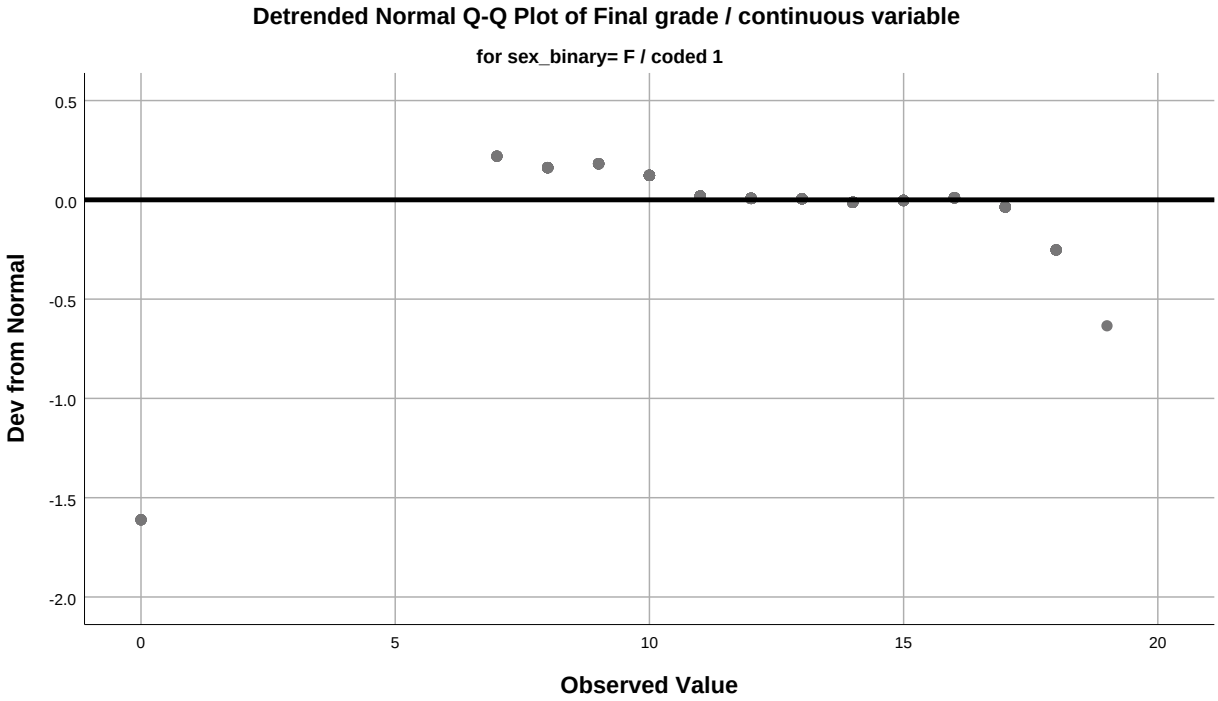
Distribution and Assumption Context
Boxplots, histograms, and normality context for G3 by the bi



Detrended Normal Q-Q Plots

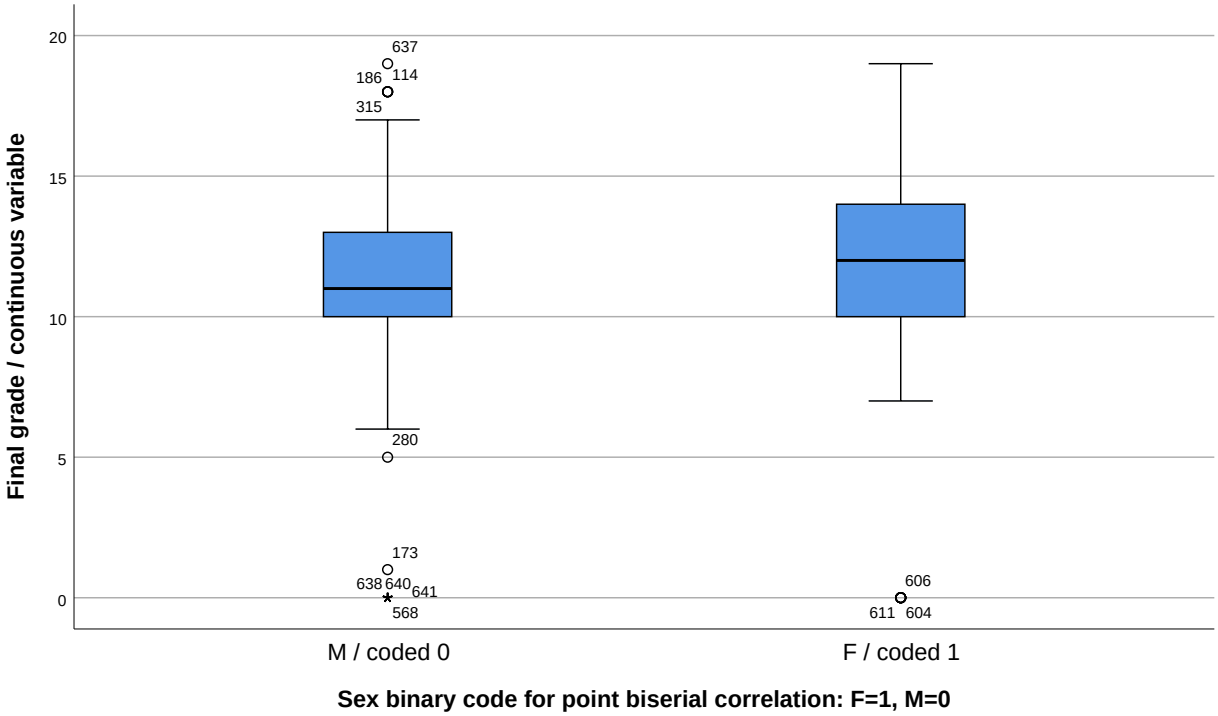
Distribution and Assumption Context
Boxplots, histograms, and normality context for G3 by the bi





Distribution and Assumption Context

Boxplots, histograms, and normality context for G3 by the bi



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>Warning # 2004.  Command name: SUBTITLE
>The subtitle given exceeds 60 characters in length.  The first 60 characters
>will be used.
```

Point Biserial Correlation
Pearson correlation between a 0/1 binary variable and a scal

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Sex binary code for point biserial correlation: F=1, M=0	.59	.492	649
Final grade / continuous variable	11.91	3.231	649

Correlations

		Sex binary code for point biserial correlation: F=1, M=0	Final grade / continuous variable
Sex binary code for point biserial correlation: F=1, M=0	Pearson Correlation	1	.129**
	Sig. (2-tailed)		.001
	N	649	649
Final grade / continuous variable	Pearson Correlation	.129**	1
	Sig. (2-tailed)	.001	
	N	649	649

**. Correlation is significant at the 0.01 level (2-tailed).

```
>Warning # 2004.  Command name: SUBTITLE
>The subtitle given exceeds 60 characters in length.  The first 60 characters
>will be used.
```

Point Biserial Correlations with Selected Numeric Variables
Supporting matrix: the binary code against age, absences, G1

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Sex binary code for point biserial correlation: F=1, M=0	.59	.492	649
age	16.74	1.218	649
absences	3.66	4.641	649
First period grade	11.40	2.745	649
Second period grade	11.57	2.914	649
Final grade / continuous variable	11.91	3.231	649

Correlations

		Sex binary code for point biserial correlation: F=1, M=0	age	absences
Sex binary code for point biserial correlation: F=1, M=0	Pearson Correlation	1	.044	-.021
	Sig. (2-tailed)		.267	.587
	N	649	649	649
age	Pearson Correlation	.044	1	.150**
	Sig. (2-tailed)	.267		.000
	N	649	649	649
absences	Pearson Correlation	-.021	.150**	1
	Sig. (2-tailed)	.587	.000	
	N	649	649	649
First period grade	Pearson Correlation	.104**	-.174**	-.147**
	Sig. (2-tailed)	.008	.000	.000
	N	649	649	649
Second period grade	Pearson Correlation	.104**	-.107**	-.125**
	Sig. (2-tailed)	.008	.006	.001
	N	649	649	649

Point Biserial Correlations with Selected Numeric Variables
Supporting matrix: the binary code against age, absences, G1

Correlations

		First period grade	Second period grade	Final grade / continuous variable
Sex binary code for point biserial correlation: F=1, M=0	Pearson Correlation	.104**	.104**	.129**
	Sig. (2-tailed)	.008	.008	.001
	N	649	649	649
age	Pearson Correlation	-.174**	-.107**	-.107**
	Sig. (2-tailed)	.000	.006	.007
	N	649	649	649
absences	Pearson Correlation	-.147**	-.125**	-.091*
	Sig. (2-tailed)	.000	.001	.020
	N	649	649	649
First period grade	Pearson Correlation	1	.865**	.826**
	Sig. (2-tailed)		.000	.000
	N	649	649	649
Second period grade	Pearson Correlation	.865**	1	.919**
	Sig. (2-tailed)	.000		.000
	N	649	649	649

Correlations

		Sex binary code for point biserial correlation: F=1, M=0	age	absences
Final grade / continuous variable	Pearson Correlation	.129**	-.107**	-.091*
	Sig. (2-tailed)	.001	.007	.020
	N	649	649	649

Point Biserial Correlations with Selected Numeric Variables
Supporting matrix: the binary code against age, absences, G1

Correlations

		First period grade	Second period grade	Final grade / continuous variable
Final grade / continuous variable	Pearson Correlation	.826**	.919**	1
	Sig. (2-tailed)	.000	.000	
	N	649	649	649

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

```
>Warning # 2004.  Command name: SUBTITLE
>The subtitle given exceeds 60 characters in length.  The first 60 characters
>will be used.
```

Equivalent Independent Samples T Test
The point biserial correlation is equivalent to testing the

T-Test

Group Statistics

	Sex binary code for point biserial correlation: F=1, M=0	N	Mean	Std. Deviation
Final grade / continuous variable	M / coded 0	266	11.41	3.321
	F / coded 1	383	12.25	3.124

Group Statistics

	Sex binary code for point biserial correlation: F=1, M=0	Std. Error Mean
Final grade / continuous variable	M / coded 0	.204
	F / coded 1	.160

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of
		F	Sig.	t
Final grade / continuous variable	Equal variances assumed	.004	.950	-3.311
	Equal variances not assumed			-3.275

Independent Samples Test

		t-test for Equality of Means		
		df	Sig. (2-tailed)	Mean Difference
Final grade / continuous variable	Equal variances assumed	647	.001	-.847
	Equal variances not assumed	547.439	.001	-.847

Equivalent Independent Samples T Test
The point biserial correlation is equivalent to testing the

Independent Samples Test

		t-test for Equality of Means		
		Std. Error Difference	95% Confidence Interval of the Difference	
			Lower	Upper
Final grade / continuous variable	Equal variances assumed	.256	-1.350	-.345
	Equal variances not assumed	.259	-1.355	-.339

Point Biserial Chart

Point Biserial Chart
Boxplot of G3 by sex_binary

Graph

```
>Error # 17804 in column 4.  Text: BOXPLOT
>Unrecognized subcommand was found.  Recognized subcommands are: TITLE,
>SUBTITLE, FOOTNOTE, BAR, PIE, LINE, HISTOGRAM, SCATTERPLOT, HILO, ERRORBAR an
d
>TEMPLATE.  Skipping to a "/".
>Execution of this command stops.
```