Negative Binomial Regression

Host

Notes

Output Created		11-JUL-2026 19:27:37
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Multiple Linear Regression\SPSS_Output\sav\Multiple-Linear-Regression-data.sav
	Active Dataset	MLRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\SPSS_Output" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\SPSS_Output"'].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.41

Host

Notes

Output Created		11-JUL-2026 19:27:37
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Multiple Linear Regression\SPSS_Output\sav\Multiple-Linear-Regression-data.sav
	Active Dataset	MLRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\SPSS_Output\sav" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\SPSS_Output\sav"'].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.17

Host

Notes

Output Created		11-JUL-2026 19:27:37
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Multiple Linear Regression\SPSS_Output\sav\Multiple-Linear-Regression-data.sav
	Active Dataset	MLRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\SPSS_Output\spv" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\SPSS_Output\spv"'].
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.14

Host

Notes

Output Created		11-JUL-2026 19:27:37
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Multiple Linear Regression\SPSS_Output\sav\Multiple-Linear-Regression-data.sav
	Active Dataset	MLRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\SPSS_Output\pdf" mkdir "D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\SPSS_Output\pdf"'].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.15

Negative Binomial Regression
Variable preparation

Negative Binomial Regression
Prepared data summary

Frequencies

Notes

Output Created		11-JUL-2026 19:27:38
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=nb_count school_ms sex_male address_urban higher_yes internet_yes schoolsup_yes famsup_yes activities_yes /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.13
	Elapsed Time	00:00:00.61

[NBRData]

Negative Binomial Regression
Prepared data summary

Statistics

		Negative binomial count outcome: round (G3) clipped at zero	School dummy: 1 = MS, 0 = GP	Sex dummy: 1 = male, 0 = female	Address dummy: 1 = urban, 0 = rural	Higher education intention dummy: yes
N	Valid	649	649	649	649	649
	Missing	0	0	0	0	0

Statistics

		Internet access dummy: yes	School support dummy: yes	Family support dummy: yes	Activities dummy: yes
N	Valid	649	649	649	649
	Missing	0	0	0	0

Frequency Table

Negative Binomial Regression
Prepared data summary

Negative binomial count outcome: round(G3) clipped at zero

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.000	15	2.3	2.3	2.3
	1.000	1	.2	.2	2.5
	5.000	1	.2	.2	2.6
	6.000	3	.5	.5	3.1
	7.000	10	1.5	1.5	4.6
	8.000	35	5.4	5.4	10.0
	9.000	35	5.4	5.4	15.4
	10.000	97	14.9	14.9	30.4
	11.000	104	16.0	16.0	46.4
	12.000	72	11.1	11.1	57.5
	13.000	82	12.6	12.6	70.1
	14.000	63	9.7	9.7	79.8
	15.000	49	7.6	7.6	87.4
	16.000	36	5.5	5.5	92.9
	17.000	29	4.5	4.5	97.4
	18.000	15	2.3	2.3	99.7
	19.000	2	.3	.3	100.0
	Total	649	100.0	100.0	

School dummy: 1 = MS, 0 = GP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	423	65.2	65.2	65.2
	Yes / target	226	34.8	34.8	100.0
	Total	649	100.0	100.0	

Negative Binomial Regression
Prepared data summary

Sex dummy: 1 = male, 0 = female

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	383	59.0	59.0	59.0
	Yes / target	266	41.0	41.0	100.0
	Total	649	100.0	100.0	

Address dummy: 1 = urban, 0 = rural

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	197	30.4	30.4	30.4
	Yes / target	452	69.6	69.6	100.0
	Total	649	100.0	100.0	

Higher education intention dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	69	10.6	10.6	10.6
	Yes / target	580	89.4	89.4	100.0
	Total	649	100.0	100.0	

Internet access dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	151	23.3	23.3	23.3
	Yes / target	498	76.7	76.7	100.0
	Total	649	100.0	100.0	

School support dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	581	89.5	89.5	89.5
	Yes / target	68	10.5	10.5	100.0
	Total	649	100.0	100.0	

Negative Binomial Regression
Prepared data summary

Family support dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	251	38.7	38.7	38.7
	Yes / target	398	61.3	61.3	100.0
	Total	649	100.0	100.0	

Activities dummy: yes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No / reference	334	51.5	51.5	51.5
	Yes / target	315	48.5	48.5	100.0
	Total	649	100.0	100.0	

Descriptives

Notes

Output Created		11-JUL-2026 19:27:40
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.

Negative Binomial Regression
Prepared data summary

Notes

Syntax		DESCRIPTIVES VARIABLES=nb_count G3 G1 G2 studytime failures absences age Medu Fedu traveltime health /STATISTICS=MEAN STDDEV VARIANCE MIN MAX.
Resources	Processor Time	00:00:00.08
	Elapsed Time	00:00:00.10

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Negative binomial count outcome: round(G3) clipped at zero	649	.000	19.000	11.90601	3.230656	10.437
Final grade source outcome	649	0	19	11.91	3.231	10.437
First period grade	649	0	19	11.40	2.745	7.536
Second period grade	649	0	19	11.57	2.914	8.489
Weekly study time group	649	1	4	1.93	.830	.688
Number of past class failures	649	0	3	.22	.593	.352
School absences	649	0	32	3.66	4.641	21.537
Age	649	15	22	16.74	1.218	1.484
Mother education	649	0	4	2.51	1.135	1.287
Father education	649	0	4	2.31	1.100	1.210
Home to school travel time	649	1	4	1.57	.749	.560
Current health status	649	1	5	3.54	1.446	2.092
Valid N (listwise)	649					

Correlations

Negative Binomial Regression
Prepared data summary

Notes

Output Created		11-JUL-2026 19:27:40
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each pair of variables are based on all the cases with valid data for that pair.
Syntax		CORRELATIONS /VARIABLES=nb_count G1 G2 studytime failures absences age Medu Fedu traveltime health /PRINT=TWOTAIL NOSIG /MISSING=PAIRWISE.
Resources	Processor Time	00:00:00.22
	Elapsed Time	00:00:00.21

Negative Binomial Regression
Prepared data summary

Correlations

		Negative binomial count outcome: round (G3) clipped at zero	First period grade	Second period grade
Negative binomial count outcome: round(G3) clipped at zero	Pearson Correlation	1	.826**	.919**
	Sig. (2-tailed)		.000	.000
	N	649	649	649
First period grade	Pearson Correlation	.826**	1	.865**
	Sig. (2-tailed)	.000		.000
	N	649	649	649
Second period grade	Pearson Correlation	.919**	.865**	1
	Sig. (2-tailed)	.000	.000	
	N	649	649	649
Weekly study time group	Pearson Correlation	.250**	.261**	.240**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
Number of past class failures	Pearson Correlation	-.393**	-.384**	-.386**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
School absences	Pearson Correlation	-.091*	-.147**	-.125**
	Sig. (2-tailed)	.020	.000	.001
	N	649	649	649
Age	Pearson Correlation	-.107**	-.174**	-.107**
	Sig. (2-tailed)	.007	.000	.006
	N	649	649	649
Mother education	Pearson Correlation	.240**	.260**	.264**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
Father education	Pearson Correlation	.212**	.218**	.225**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649

Negative Binomial Regression
Prepared data summary

Correlations

		Weekly study time group	Number of past class failures	School absences
Negative binomial count outcome: round(G3) clipped at zero	Pearson Correlation	.250**	-.393**	-.091*
	Sig. (2-tailed)	.000	.000	.020
	N	649	649	649
First period grade	Pearson Correlation	.261**	-.384**	-.147**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
Second period grade	Pearson Correlation	.240**	-.386**	-.125**
	Sig. (2-tailed)	.000	.000	.001
	N	649	649	649
Weekly study time group	Pearson Correlation	1	-.147**	-.118**
	Sig. (2-tailed)		.000	.003
	N	649	649	649
Number of past class failures	Pearson Correlation	-.147**	1	.123**
	Sig. (2-tailed)	.000		.002
	N	649	649	649
School absences	Pearson Correlation	-.118**	.123**	1
	Sig. (2-tailed)	.003	.002	
	N	649	649	649
Age	Pearson Correlation	-.008	.320**	.150**
	Sig. (2-tailed)	.831	.000	.000
	N	649	649	649
Mother education	Pearson Correlation	.097*	-.172**	-.009
	Sig. (2-tailed)	.013	.000	.827
	N	649	649	649
Father education	Pearson Correlation	.050	-.166**	.030
	Sig. (2-tailed)	.200	.000	.448
	N	649	649	649

Negative Binomial Regression
Prepared data summary

Correlations

		Age	Mother education	Father education
Negative binomial count outcome: round(G3) clipped at zero	Pearson Correlation	-.107**	.240**	.212**
	Sig. (2-tailed)	.007	.000	.000
	N	649	649	649
First period grade	Pearson Correlation	-.174**	.260**	.218**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
Second period grade	Pearson Correlation	-.107**	.264**	.225**
	Sig. (2-tailed)	.006	.000	.000
	N	649	649	649
Weekly study time group	Pearson Correlation	-.008	.097*	.050
	Sig. (2-tailed)	.831	.013	.200
	N	649	649	649
Number of past class failures	Pearson Correlation	.320**	-.172**	-.166**
	Sig. (2-tailed)	.000	.000	.000
	N	649	649	649
School absences	Pearson Correlation	.150**	-.009	.030
	Sig. (2-tailed)	.000	.827	.448
	N	649	649	649
Age	Pearson Correlation	1	-.108**	-.121**
	Sig. (2-tailed)		.006	.002
	N	649	649	649
Mother education	Pearson Correlation	-.108**	1	.647**
	Sig. (2-tailed)	.006		.000
	N	649	649	649
Father education	Pearson Correlation	-.121**	.647**	1
	Sig. (2-tailed)	.002	.000	
	N	649	649	649

Negative Binomial Regression
Prepared data summary

Correlations

		Home to school travel time	Current health status
Negative binomial count outcome: round(G3) clipped at zero	Pearson Correlation	-.127**	-.099*
	Sig. (2-tailed)	.001	.012
	N	649	649
First period grade	Pearson Correlation	-.154**	-.052
	Sig. (2-tailed)	.000	.189
	N	649	649
Second period grade	Pearson Correlation	-.154**	-.082*
	Sig. (2-tailed)	.000	.036
	N	649	649
Weekly study time group	Pearson Correlation	-.063	-.056
	Sig. (2-tailed)	.108	.151
	N	649	649
Number of past class failures	Pearson Correlation	.098*	.036
	Sig. (2-tailed)	.013	.365
	N	649	649
School absences	Pearson Correlation	-.008	-.030
	Sig. (2-tailed)	.836	.442
	N	649	649
Age	Pearson Correlation	.034	-.009
	Sig. (2-tailed)	.380	.824
	N	649	649
Mother education	Pearson Correlation	-.265**	.005
	Sig. (2-tailed)	.000	.907
	N	649	649
Father education	Pearson Correlation	-.208**	.045
	Sig. (2-tailed)	.000	.253
	N	649	649

Negative Binomial Regression
Prepared data summary

Correlations

		Negative binomial count outcome: round (G3) clipped at zero	First period grade	Second period grade
Home to school travel time	Pearson Correlation	-.127**	-.154**	-.154**
	Sig. (2-tailed)	.001	.000	.000
	N	649	649	649
Current health status	Pearson Correlation	-.099*	-.052	-.082*
	Sig. (2-tailed)	.012	.189	.036
	N	649	649	649

Correlations

		Weekly study time group	Number of past class failures	School absences
Home to school travel time	Pearson Correlation	-.063	.098*	-.008
	Sig. (2-tailed)	.108	.013	.836
	N	649	649	649
Current health status	Pearson Correlation	-.056	.036	-.030
	Sig. (2-tailed)	.151	.365	.442
	N	649	649	649

Negative Binomial Regression
Prepared data summary

Correlations

		Age	Mother education	Father education
Home to school travel time	Pearson Correlation	.034	-.265**	-.208**
	Sig. (2-tailed)	.380	.000	.000
	N	649	649	649
Current health status	Pearson Correlation	-.009	.005	.045
	Sig. (2-tailed)	.824	.907	.253
	N	649	649	649

Correlations

		Home to school travel time	Current health status
Home to school travel time	Pearson Correlation	1	-.048
	Sig. (2-tailed)		.220
	N	649	649
Current health status	Pearson Correlation	-.048	1
	Sig. (2-tailed)	.220	
	N	649	649

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

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

Generalized Linear Models

Notes

Output Created		11-JUL-2026 19:27:41
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GENLIN nb_count WITH G1 G2 studytime failures absences age Medu Fedu traveltime health school_ms sex_male address_urban higher_yes internet_yes /MODEL G1 G2 studytime failures absences age Medu Fedu traveltime health school_ms sex_male address_urban higher_yes internet_yes INTERCEPT=YES DISTRIBUTION=POISSON LINK=LOG /CRITERIA METHOD=FISHER(1) SCALE=MLE COVB=MODEL MAXITERATIONS=100 MAXSTEPHALVING=5 PCONVERGE=1E-006 (ABSOLUTE) SINGULAR=1E-012 /PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

Negative Binomial Regression
Poisson model context for dispersion comparison

Notes

Resources	Processor Time	00:00:00.17
	Elapsed Time	00:00:00.23

Warnings

Value MLE specified for SCALE in subcommand CRITERIA is invalid when probability distribution type is either negative binomial, Poisson, binomial or multinomial.
Execution of this command stops.

Generalized Linear Models

Notes

Output Created		11-JUL-2026 19:27:42
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		GENLIN nb_count WITH G1 G2 studytime failures absences age Medu Fedu traveltime health school_ms sex_male address_urban higher_yes internet_yes /MODEL G1 G2 studytime failures absences age Medu Fedu traveltime health school_ms sex_male address_urban higher_yes internet_yes INTERCEPT=YES DISTRIBUTION=NEGBIN (MLE) LINK=LOG /CRITERIA METHOD=FISHER(1) SCALE=MLE COVB=ROBUST MAXITERATIONS=100 MAXSTEPHALVING=5 PCONVERGE=1E-006 (ABSOLUTE) SINGULAR=1E-012 /PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.
Resources	Processor Time	00:00:00.14
	Elapsed Time	00:00:00.21

Warnings

Value MLE specified for SCALE in subcommand CRITERIA is invalid when probability distribution type is either negative binomial, Poisson, binomial or multinomial.
Execution of this command stops.

Generalized Linear Models

Notes

Output Created		11-JUL-2026 19:27:42
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		GENLIN nb_count WITH G1 G2 studytime failures absences age /MODEL G1 G2 studytime failures absences age INTERCEPT=YES DISTRIBUTION=NEGBIN (MLE) LINK=LOG /CRITERIA METHOD=FISHER(1) SCALE=MLE COVB=ROBUST MAXITERATIONS=100 MAXSTEPHALVING=5 PCONVERGE=1E-006 (ABSOLUTE) SINGULAR=1E-012 /PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.
Resources	Processor Time	00:00:00.09
	Elapsed Time	00:00:00.24

Warnings

Value MLE specified for SCALE in subcommand CRITERIA is invalid when probability distribution type is either negative binomial, Poisson, binomial or multinomial.
Execution of this command stops.

Explore

Notes

Output Created		11-JUL-2026 19:27:42
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values for dependent variables are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any dependent variable or factor used.
Syntax		EXAMINE VARIABLES=nb_count G3 G1 G2 absences /PLOT BOXPLOT STEMLEAF NPPLOT HISTOGRAM /COMPARE GROUPS /STATISTICS DESCRIPTIVES EXTREME /CINTERVAL 95 /MISSING LISTWISE /NOTOTAL.
Resources	Processor Time	00:00:13.64
	Elapsed Time	00:00:23.29

Negative Binomial Regression
Count outcome diagnostics

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Negative binomial count outcome: round(G3) clipped at zero	649	100.0%	0	0.0%	649	100.0%
Final grade source outcome	649	100.0%	0	0.0%	649	100.0%
First period grade	649	100.0%	0	0.0%	649	100.0%
Second period grade	649	100.0%	0	0.0%	649	100.0%
School absences	649	100.0%	0	0.0%	649	100.0%

Descriptives

			Statistic	Std. Error
Negative binomial count outcome: round(G3) clipped at zero	Mean		11.90601	.126814
	95% Confidence Interval for Mean	Lower Bound	11.65699	
		Upper Bound	12.15503	
	5% Trimmed Mean		12.05744	
	Median		12.00000	
	Variance		10.437	
	Std. Deviation		3.230656	
	Minimum		.000	
	Maximum		19.000	
	Range		19.000	
	Interquartile Range		4.000	
	Skewness		-.913	.096
	Kurtosis		2.712	.192
Final grade source outcome	Mean		11.91	.127
	95% Confidence Interval for Mean	Lower Bound	11.66	
		Upper Bound	12.16	
	5% Trimmed Mean		12.06	
	Median		12.00	
	Variance		10.437	
	Std. Deviation		3.231	

Negative Binomial Regression
Count outcome diagnostics

Descriptives

			Statistic	Std. Error
	Minimum		0	
	Maximum		19	
	Range		19	
	Interquartile Range		4	
	Skewness		-.913	.096
	Kurtosis		2.712	.192
First period grade	Mean		11.40	.108
	95% Confidence Interval for Mean	Lower Bound	11.19	
		Upper Bound	11.61	
	5% Trimmed Mean		11.39	
	Median		11.00	
	Variance		7.536	
	Std. Deviation		2.745	
	Minimum		0	
	Maximum		19	
	Range		19	
	Interquartile Range		3	
	Skewness		-.003	.096
	Kurtosis		.037	.192
Second period grade	Mean		11.57	.114
	95% Confidence Interval for Mean	Lower Bound	11.35	
		Upper Bound	11.79	
	5% Trimmed Mean		11.60	
	Median		11.00	
	Variance		8.489	
	Std. Deviation		2.914	
	Minimum		0	
	Maximum		19	
	Range		19	
	Interquartile Range		3	
	Skewness		-.360	.096
	Kurtosis		1.662	.192

Negative Binomial Regression
Count outcome diagnostics

Descriptives

			Statistic	Std. Error
School absences	Mean		3.66	.182
	95% Confidence Interval for Mean	Lower Bound	3.30	
		Upper Bound	4.02	
	5% Trimmed Mean		3.09	
	Median		2.00	
	Variance		21.537	
	Std. Deviation		4.641	
	Minimum		0	
	Maximum		32	
	Range		32	
	Interquartile Range		6	
	Skewness		2.021	.096
	Kurtosis		5.781	.192

Extreme Values

			Case Number	Value
Negative binomial count outcome: round(G3) clipped at zero	Highest	1	339	19.000
		2	637	19.000
		3	114	18.000
		4	182	18.000
		5	186	18.000[a]
	Lowest	1	641	.000
		2	640	.000
		3	638	.000
		4	627	.000
		5	611	.000[b]
Final grade source outcome	Highest	1	339	19
		2	637	19
		3	114	18
		4	182	18
		5	186	18[a]

Negative Binomial Regression
Count outcome diagnostics

Extreme Values

			Case Number	Value
	Lowest	1	641	0
		2	640	0
		3	638	0
		4	627	0
		5	611	0[b]
First period grade	Highest	1	618	19
		2	114	18
		3	333	18
		4	339	18
		5	345	18[a]
	Lowest	1	1	0
		2	570	4
		3	568	4
		4	640	5
		5	606	5[c]
Second period grade	Highest	1	339	19
		2	197	18
		3	241	18
		4	333	18
		5	338	18[a]
	Lowest	1	611	0
		2	606	0
		3	604	0
		4	598	0
		5	568	0[b]
School absences	Highest	1	198	32
		2	213	30
		3	257	26
		4	151	24
		5	156	22[d]

Negative Binomial Regression
Count outcome diagnostics

Extreme Values

		Case Number	Value
Lowest	1	643	0
	2	642	0
	3	641	0
	4	640	0
	5	638	0[b]

a. Only a partial list of cases with the value 18.000 are shown in the table of upper extremes.

b. Only a partial list of cases with the value .000 are shown in the table of lower extremes.

c. Only a partial list of cases with the value 5 are shown in the table of lower extremes.

d. Only a partial list of cases with the value 22 are shown in the table of upper extremes.

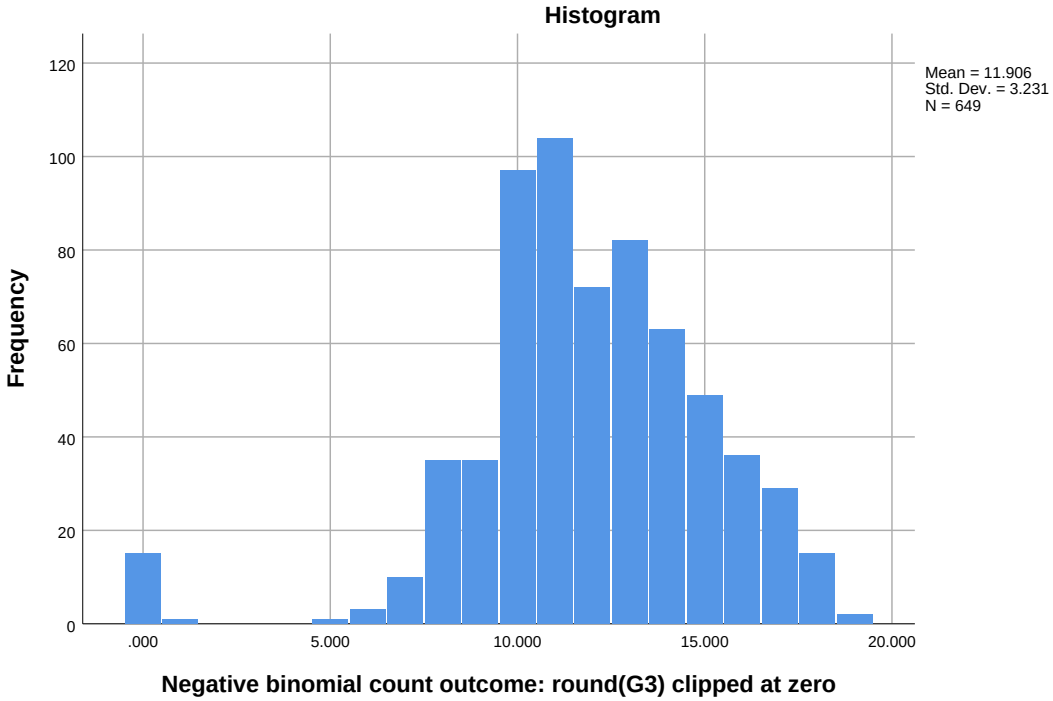
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Negative binomial count outcome: round(G3) clipped at zero	.124	649	.000	.926	649	.000
Final grade source outcome	.124	649	.000	.926	649	.000
First period grade	.086	649	.000	.986	649	.000
Second period grade	.088	649	.000	.962	649	.000
School absences	.215	649	.000	.772	649	.000

a. Lilliefors Significance Correction

Negative binomial count outcome: round(G3) clipped at zero

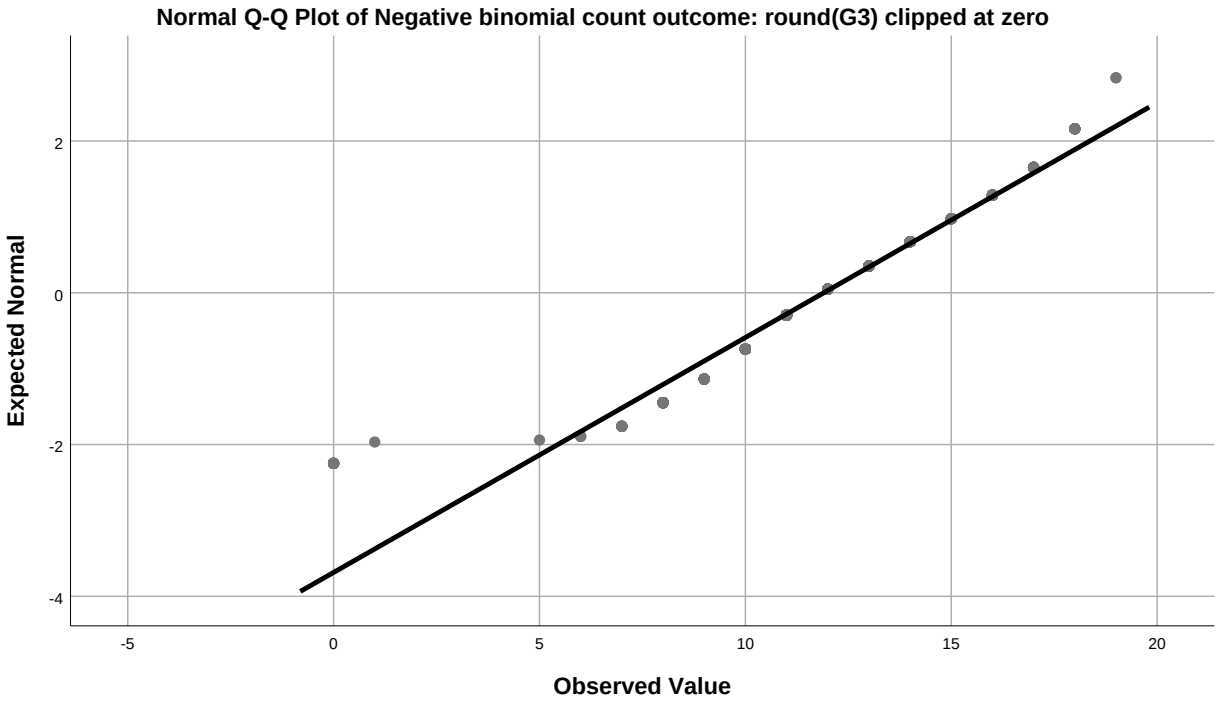
Negative Binomial Regression
Count outcome diagnostics



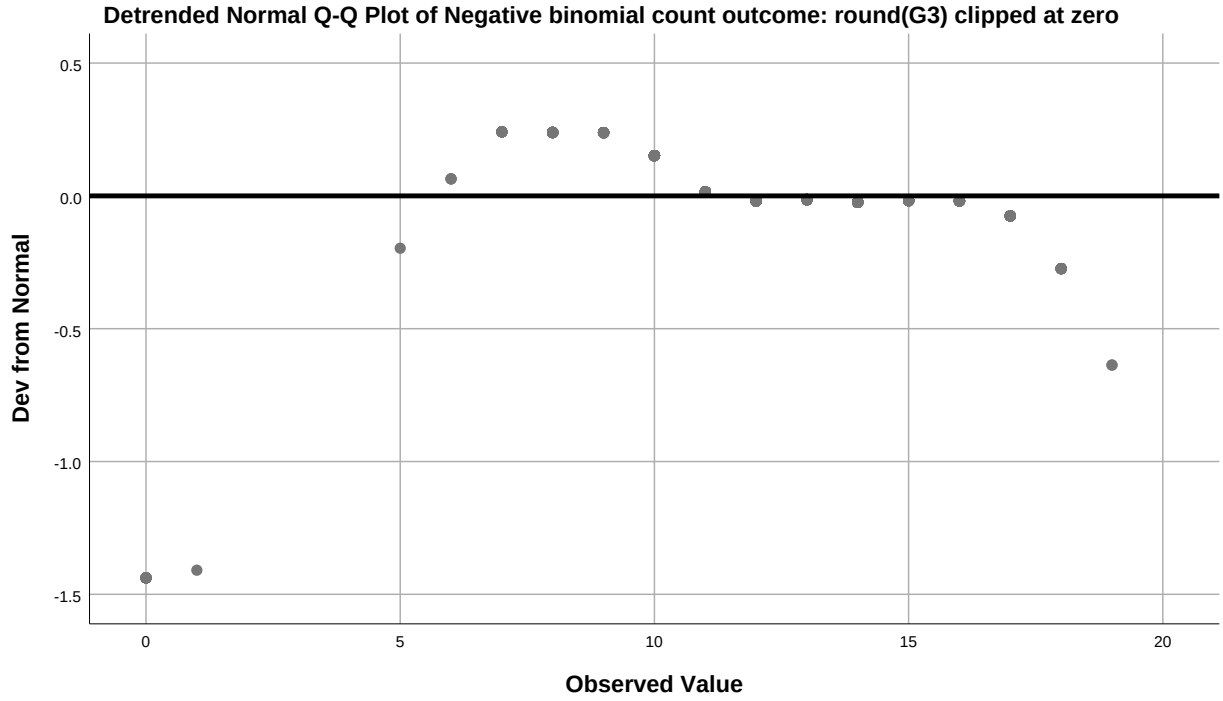
Negative binomial count outcome: round(G3) clipped at zero Stem-and-Leaf Plot

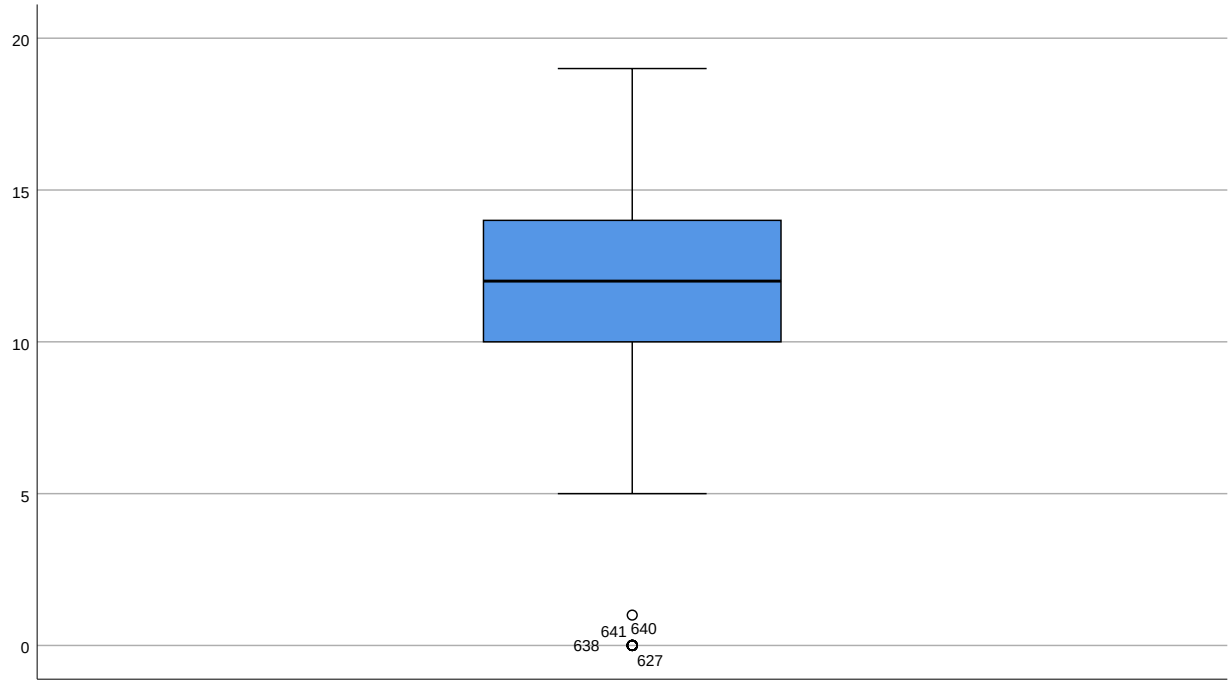
```
 Frequency    Stem &  Leaf

    16.00 Extremes    (=<1.0)
     1.00         5 .  &
     3.00         6 .  0
    10.00         7 .  00000
    35.00         8 .  00000000000000000
    35.00         9 .  00000000000000000
    97.00        10 .  00000000000000000000000000000000000000000000000000
   104.00        11 .  00000000000000000000000000000000000000000000000000000000
    72.00        12 .  000000000000000000000000000000000000
    82.00        13 .  0000000000000000000000000000000000000000
    63.00        14 .  000000000000000000000000000000
    49.00        15 .  000000000000000000000000
    36.00        16 .  000000000000000000
    29.00        17 .  000000000000000
    15.00        18 .  0000000
     2.00        19 .  0
```

```
Stem width:     1.000
Each leaf:        2 case(s)


& denotes fractional leaves.
```



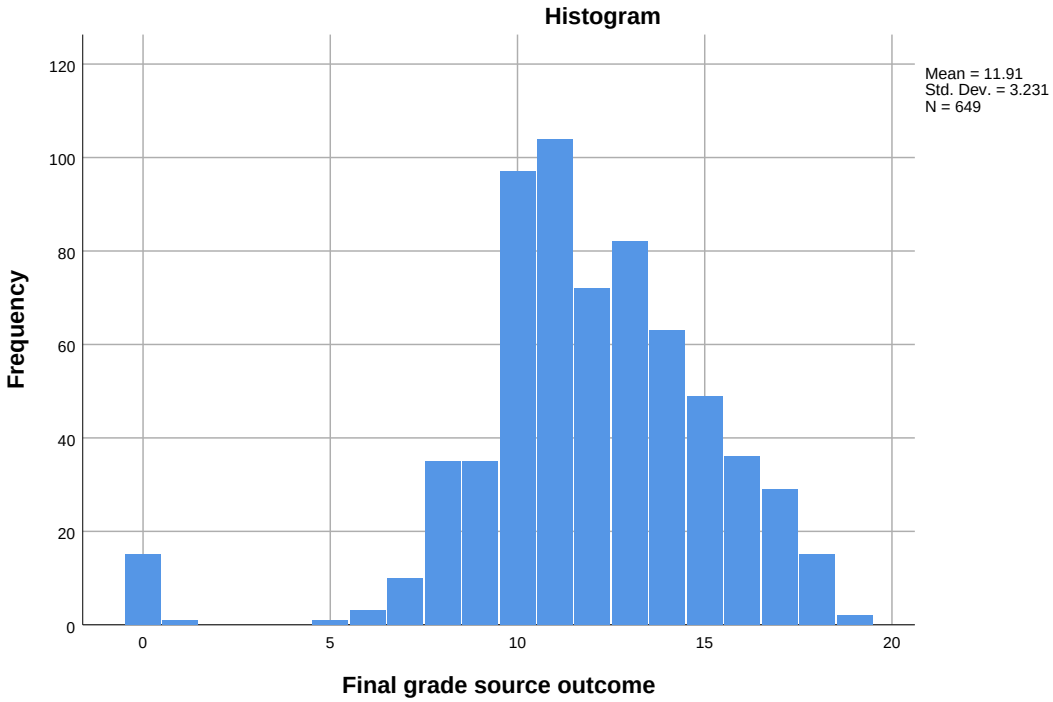
Negative Binomial Regression
Count outcome diagnostics





Negative binomial count outcome: round(G3) clipped at zero

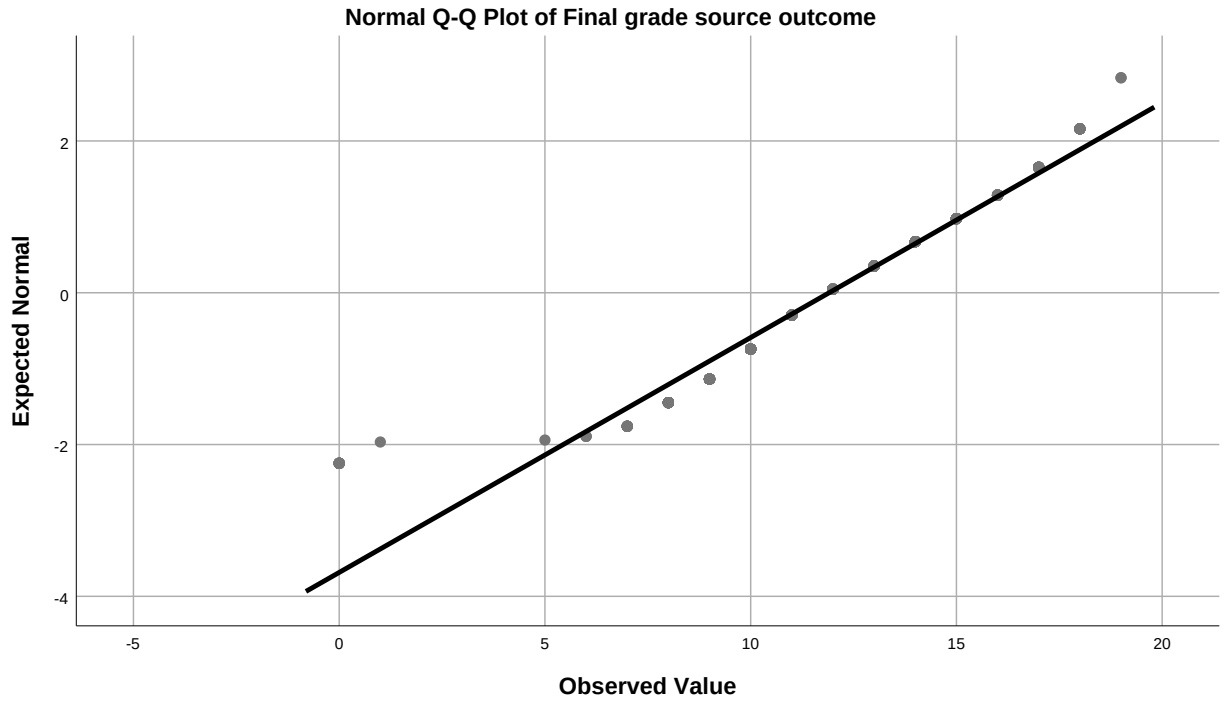
Final grade source outcome



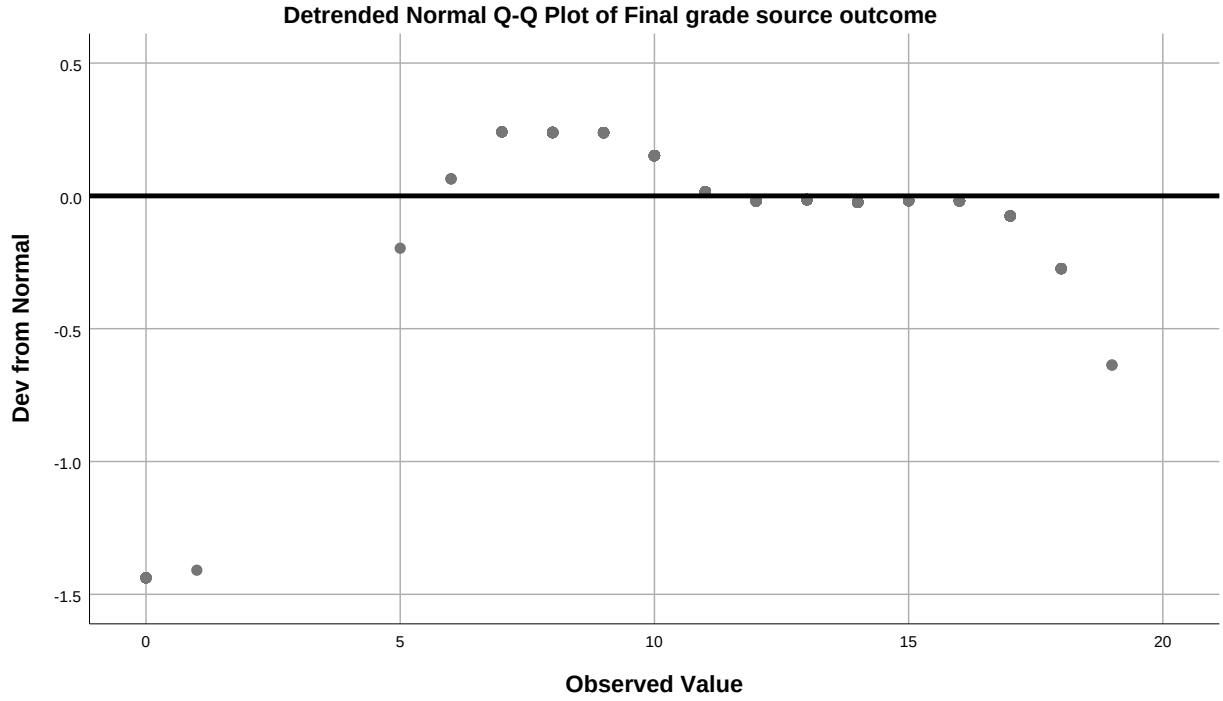
Final grade source outcome Stem-and-Leaf Plot

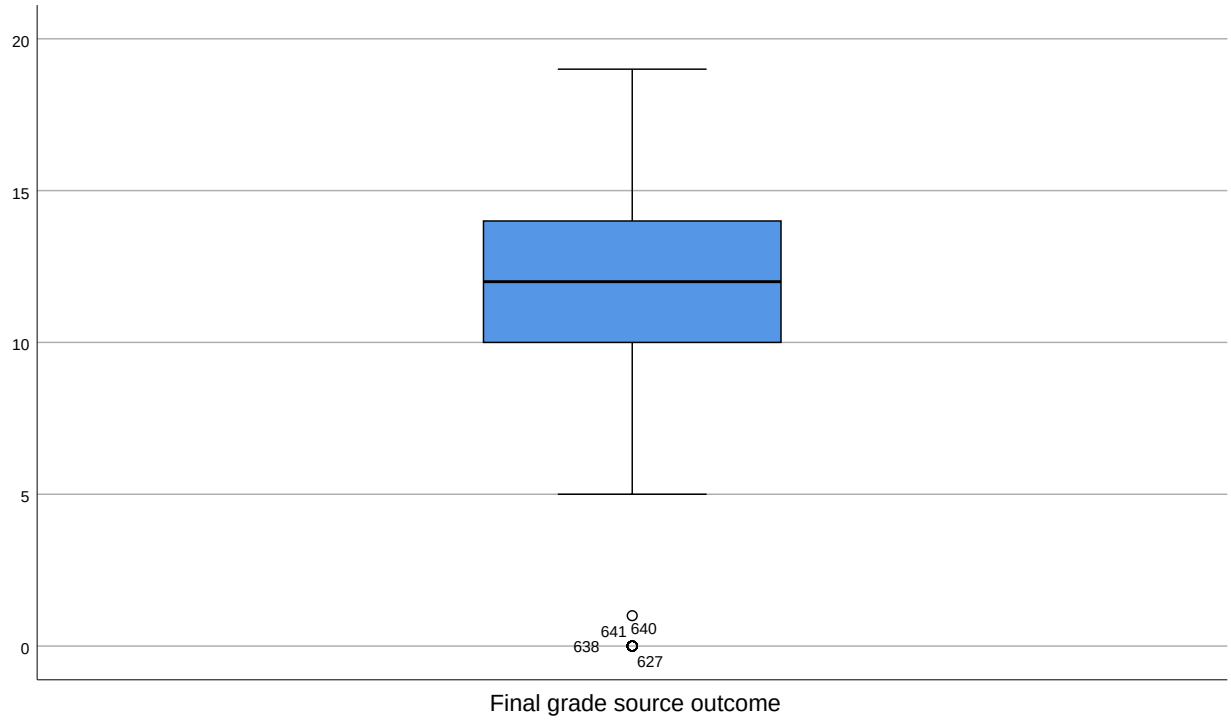
```
 Frequency    Stem &  Leaf

    16.00 Extremes    (=<1.0)
     1.00         5 .  &
     3.00         6 .  0
    10.00         7 .  00000
    35.00         8 .  00000000000000000
    35.00         9 .  00000000000000000
    97.00        10 .  00000000000000000000000000000000000000000000000000
   104.00        11 .  00000000000000000000000000000000000000000000000000000000
    72.00        12 .  000000000000000000000000000000000000
    82.00        13 .  0000000000000000000000000000000000000000
    63.00        14 .  000000000000000000000000000000000
    49.00        15 .  0000000000000000000000
    36.00        16 .  000000000000000000
    29.00        17 .  00000000000000
```

```
   15.00       18 .  0000000
    2.00       19 .  0

Stem width:         1
Each leaf:        2 case(s)


& denotes fractional leaves.
```



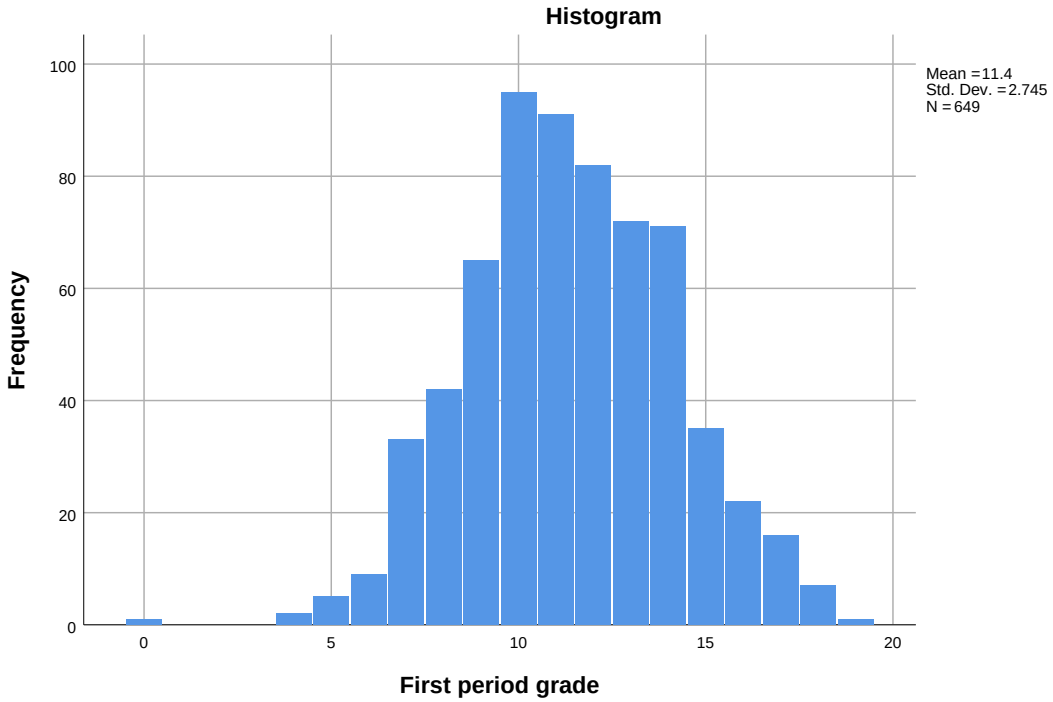
Negative Binomial Regression
Count outcome diagnostics





Negative Binomial Regression
Count outcome diagnostics

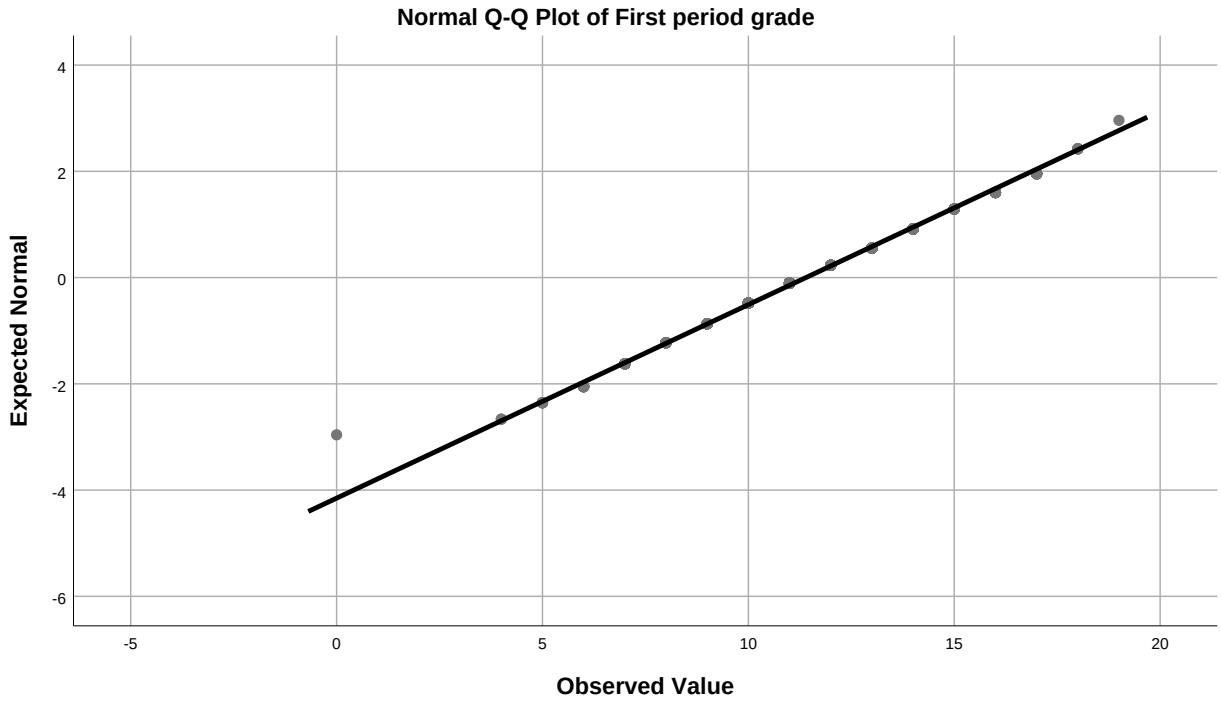
First period grade



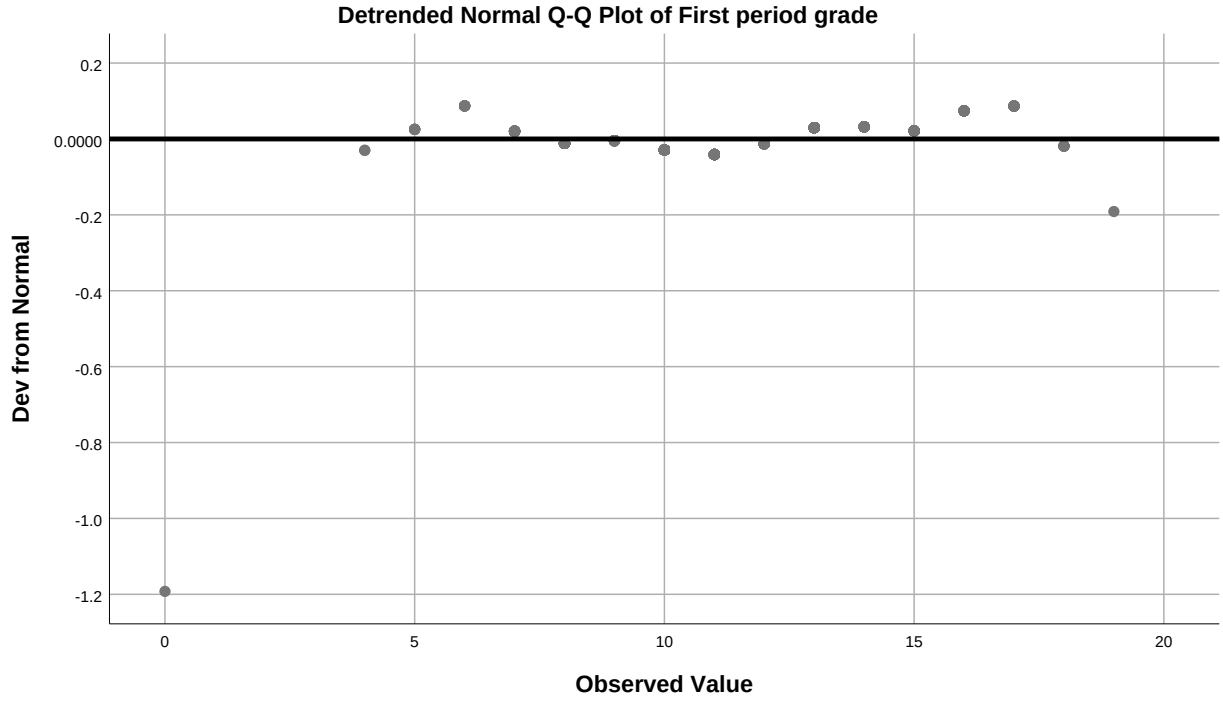
First period grade Stem-and-Leaf Plot

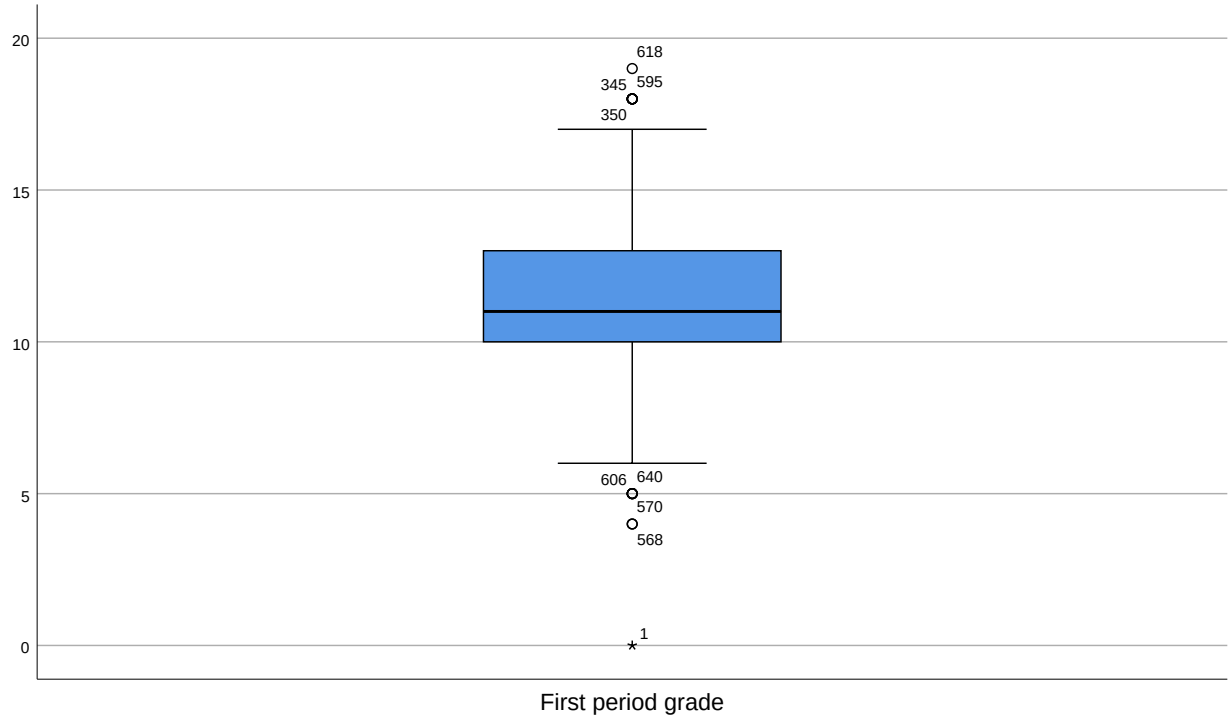
```
 Frequency    Stem &  Leaf

     8.00 Extremes    (=<5.0)
     9.00        6 .  000000000
    33.00        7 .  000000000000000000000000000000000
    42.00        8 .  000000000000000000000000000000000000000000
    65.00        9 .  00000000000000000000000000000000000000000000000000000000000000000
000000000
    95.00       10 .  00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
    91.00       11 .  00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
    82.00       12 .  00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
    72.00       13 .  00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
```

```
    71.00       14 .  00000000000000000000000000000000000000000000000000000000000000
000000000000000
    35.00       15 .  000000000000000000000000000000000
    22.00       16 .  00000000000000000000
    16.00       17 .  00000000000000000
     8.00 Extremes    (>=18.0)

 Stem width:         1
 Each leaf:        1 case(s)
```

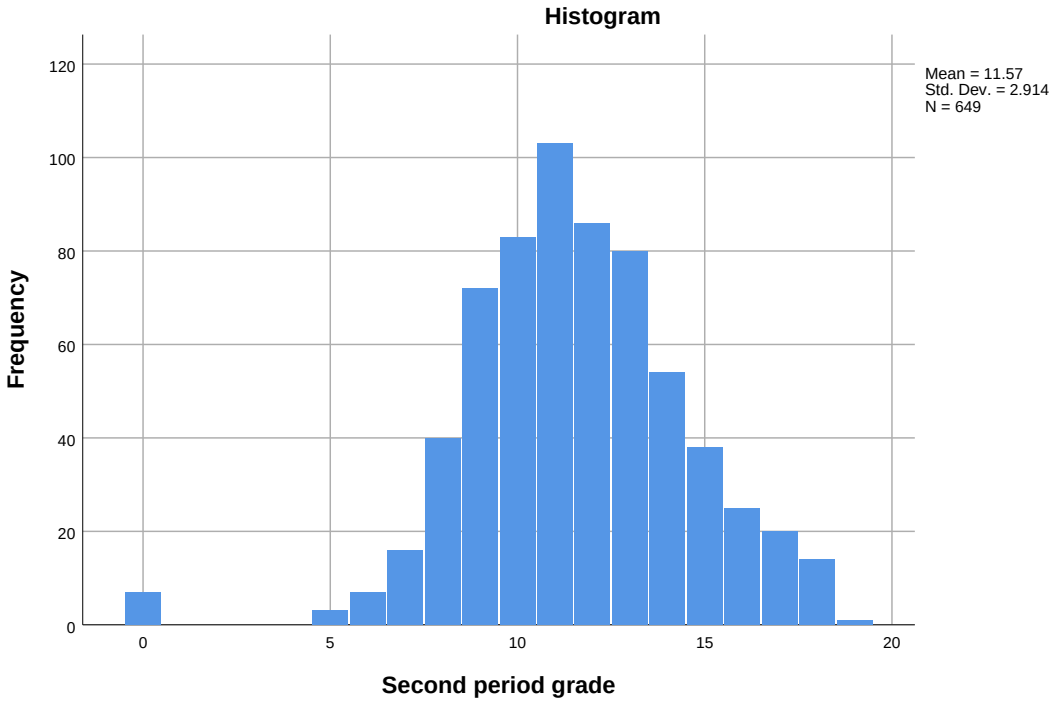


Negative Binomial Regression
Count outcome diagnostics





Second period grade

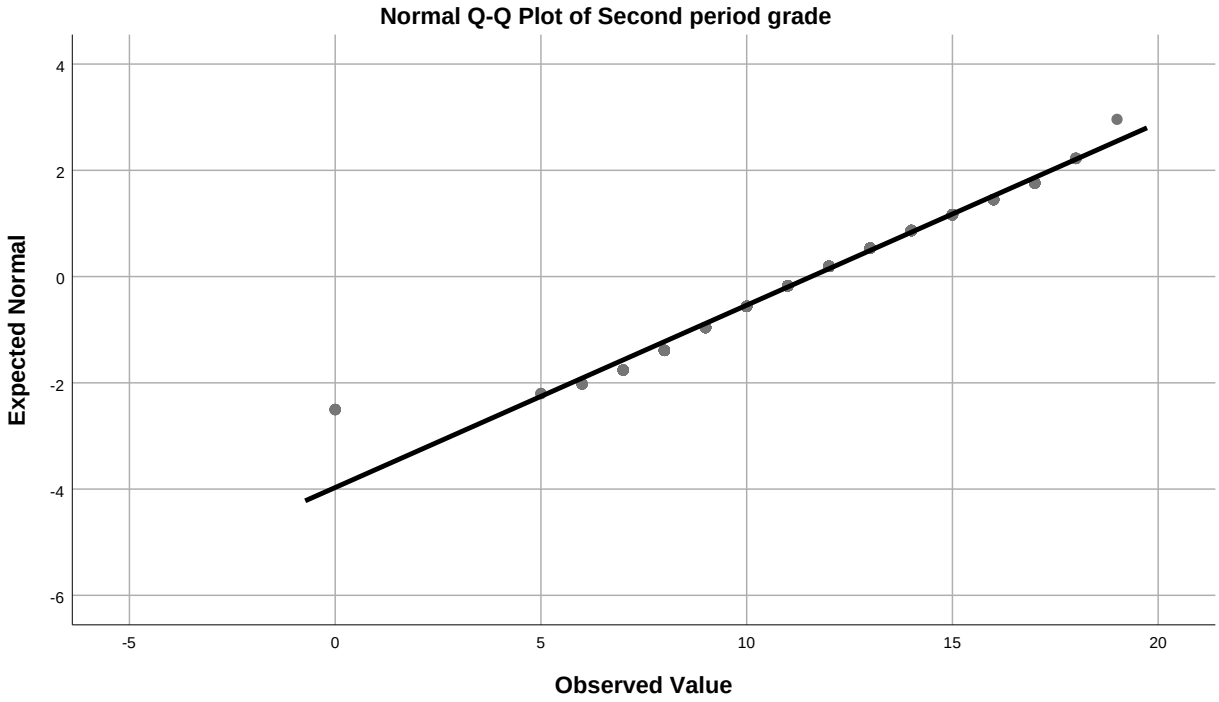


Second period grade Stem-and-Leaf Plot

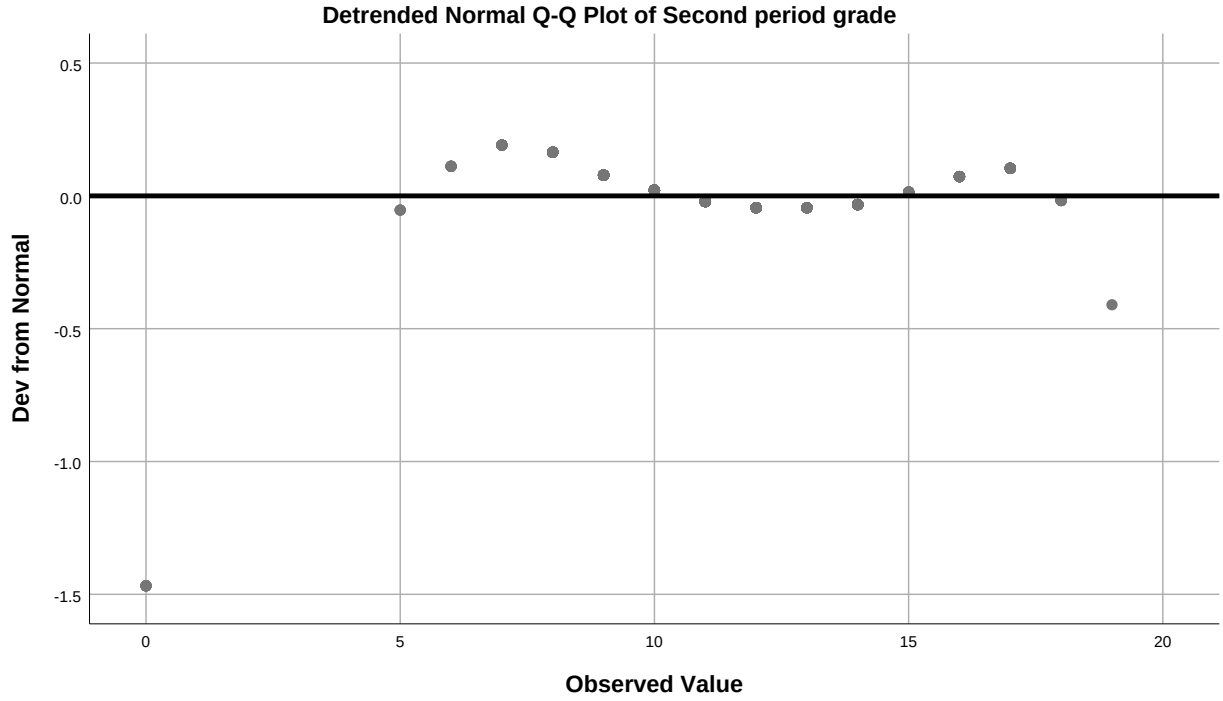
Frequency		Stem &	Leaf
10.00	Extremes		(=<5.0)
7.00		6 .	000
16.00		7 .	00000000
40.00		8 .	0000000000000000000
72.00		9 .	000000000000000000000000000000000000
83.00		10 .	00000000000000000000000000000000000000000
103.00		11 .	0000000000000000000000000000000000000000000000000000
86.00		12 .	00000000000000000000000000000000000000000000
80.00		13 .	0000000000000000000000000000000000000000
54.00		14 .	000000000000000000000000000
38.00		15 .	00000000000000000000
25.00		16 .	000000000000
20.00		17 .	0000000000
15.00	Extremes		(>=18.0)

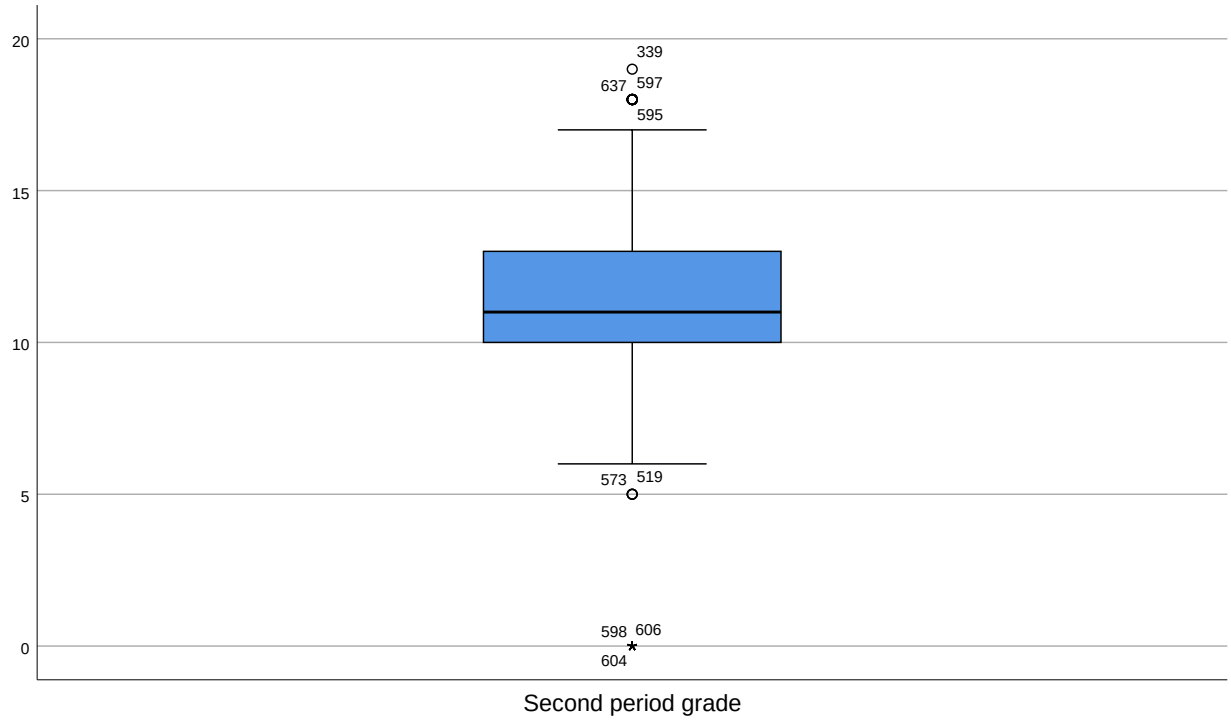
Negative Binomial Regression
Count outcome diagnostics

```
Stem width:         1
Each leaf:        2 case(s)
```

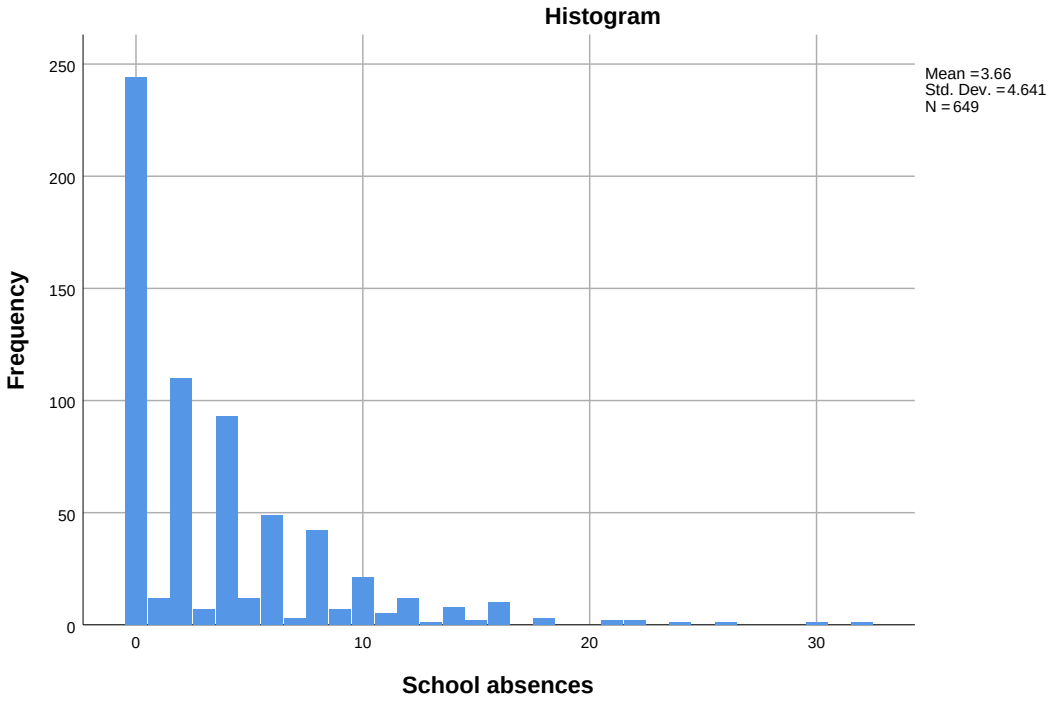


Negative Binomial Regression
Count outcome diagnostics





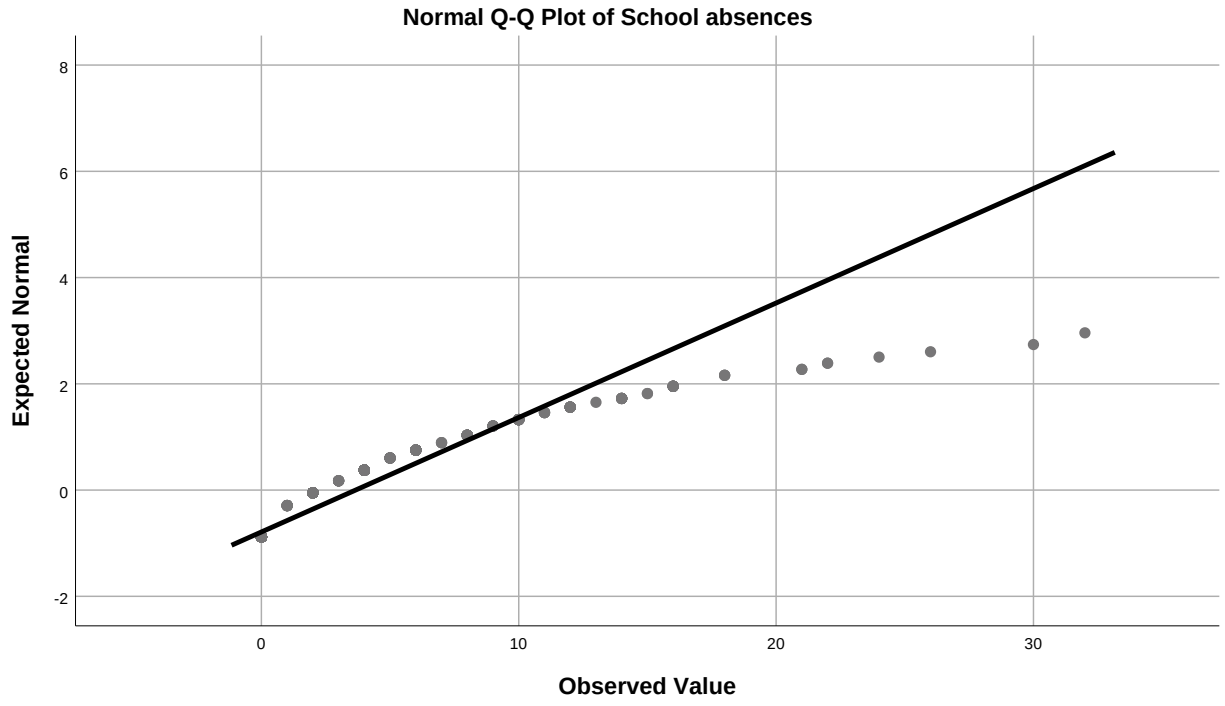
School absences



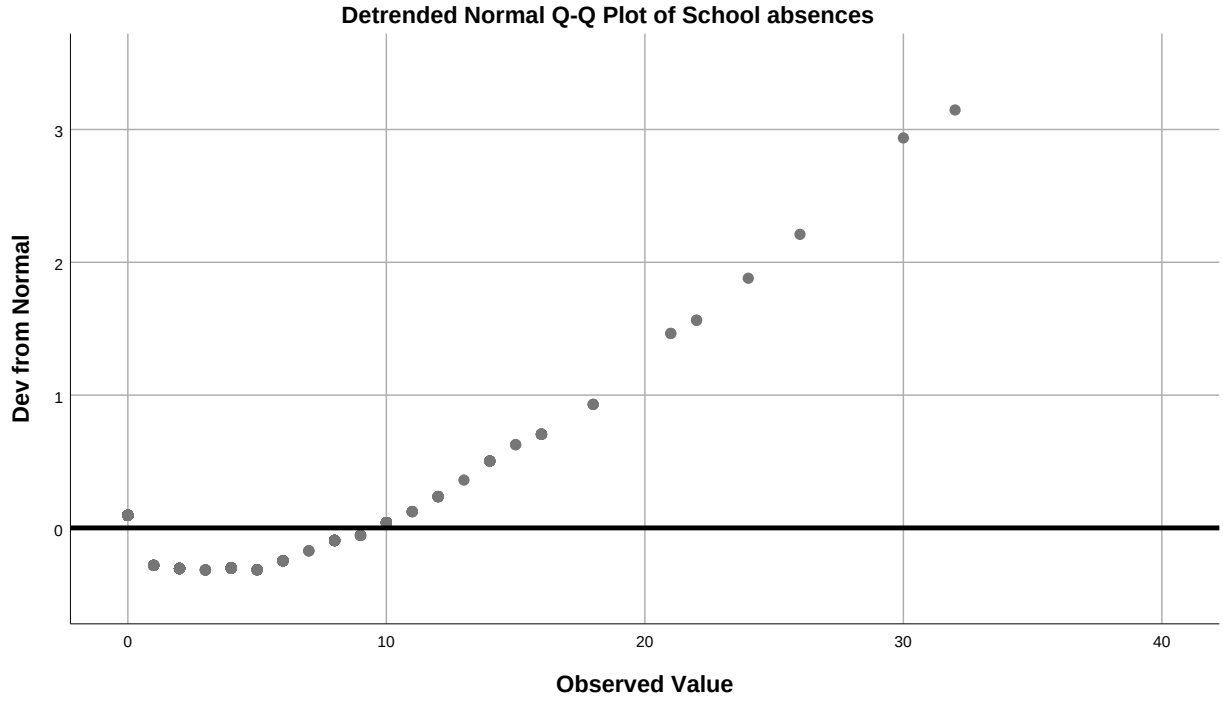
School absences Stem-and-Leaf Plot

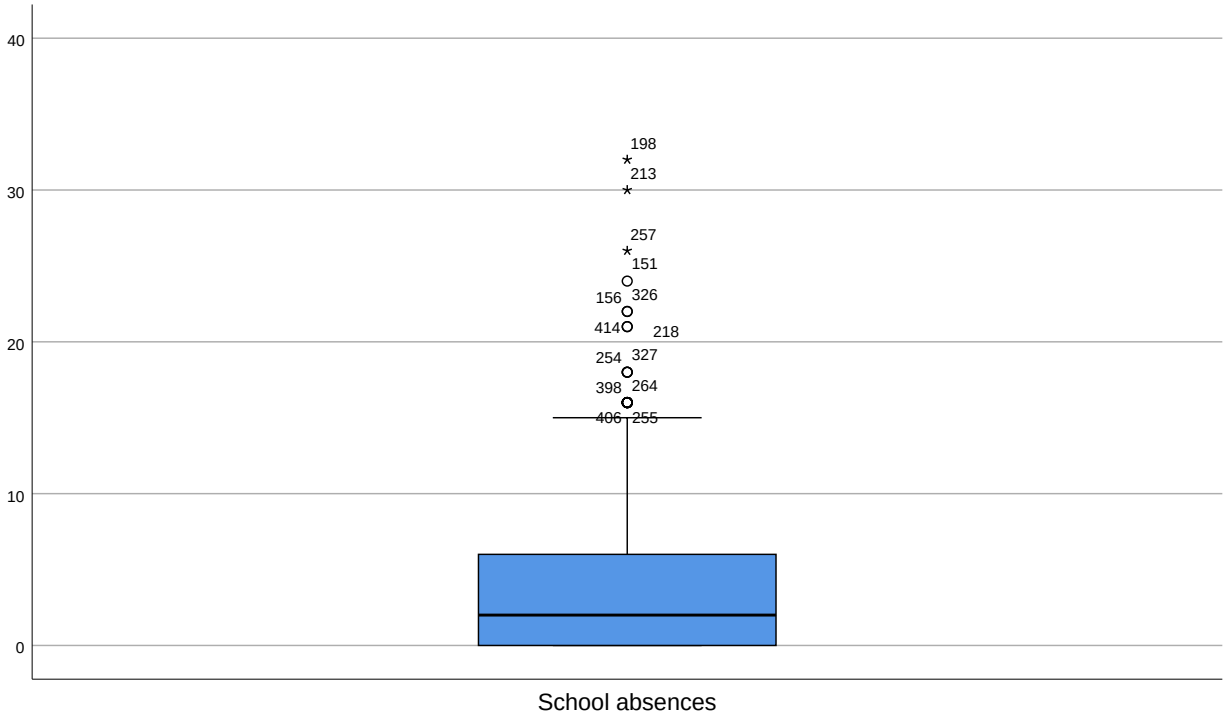
```
 Frequency    Stem &  Leaf

   244.00        0 .  00000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
    12.00        1 .  0000
   110.00        2 .  00000000000000000000000000000000000000
     7.00        3 .  00
    93.00        4 .  000000000000000000000000000000
    12.00        5 .  0000
    49.00        6 .  0000000000000000
     3.00        7 .  0
    42.00        8 .  000000000000000
     7.00        9 .  00
    21.00       10 .  0000000
     5.00       11 .  00
    12.00       12 .  0000
```

```
    1.00       13 .  &
    8.00       14 .  000
    2.00       15 .  0
   21.00 Extremes    (>=16.0)

Stem width:         1
Each leaf:        3 case(s)


& denotes fractional leaves.
```



Negative Binomial Regression
Count outcome diagnostics



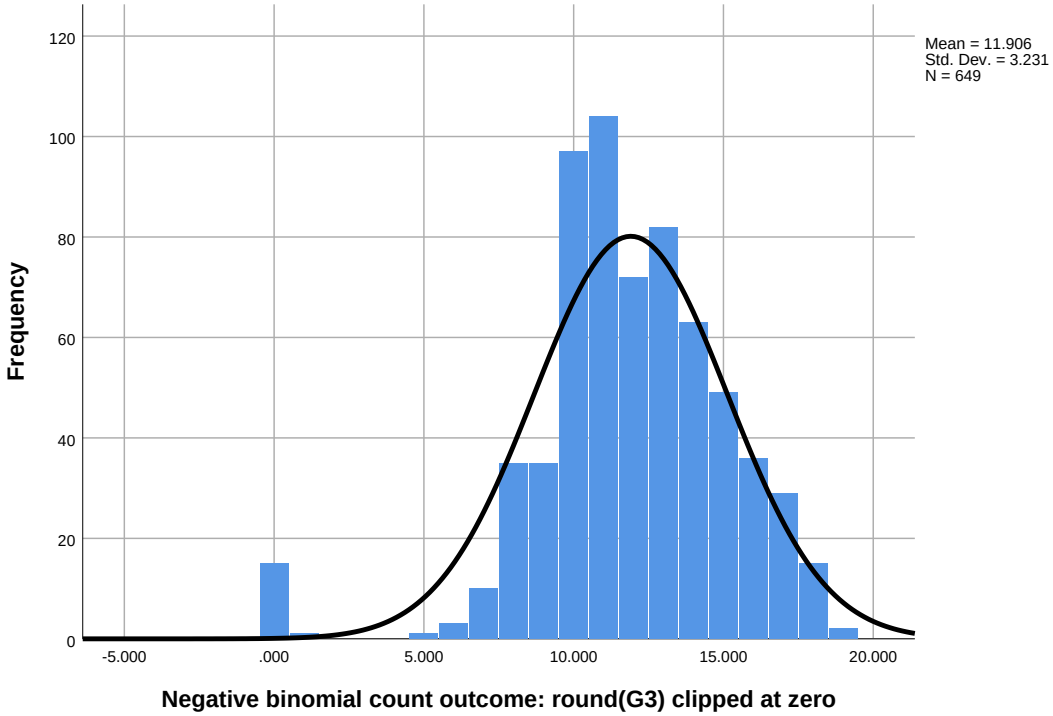


Graph

Notes

Output Created		11-JUL-2026 19:28:06
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /HISTOGRAM(NORMAL) =nb_count.
Resources	Processor Time	00:00:00.50
	Elapsed Time	00:00:00.68

Negative Binomial Regression
Count outcome diagnostics



Graph

Negative Binomial Regression
Count outcome diagnostics

Notes

Output Created		11-JUL-2026 19:28:06
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /HISTOGRAM(NORMAL) =absences.
Resources	Processor Time	00:00:00.80
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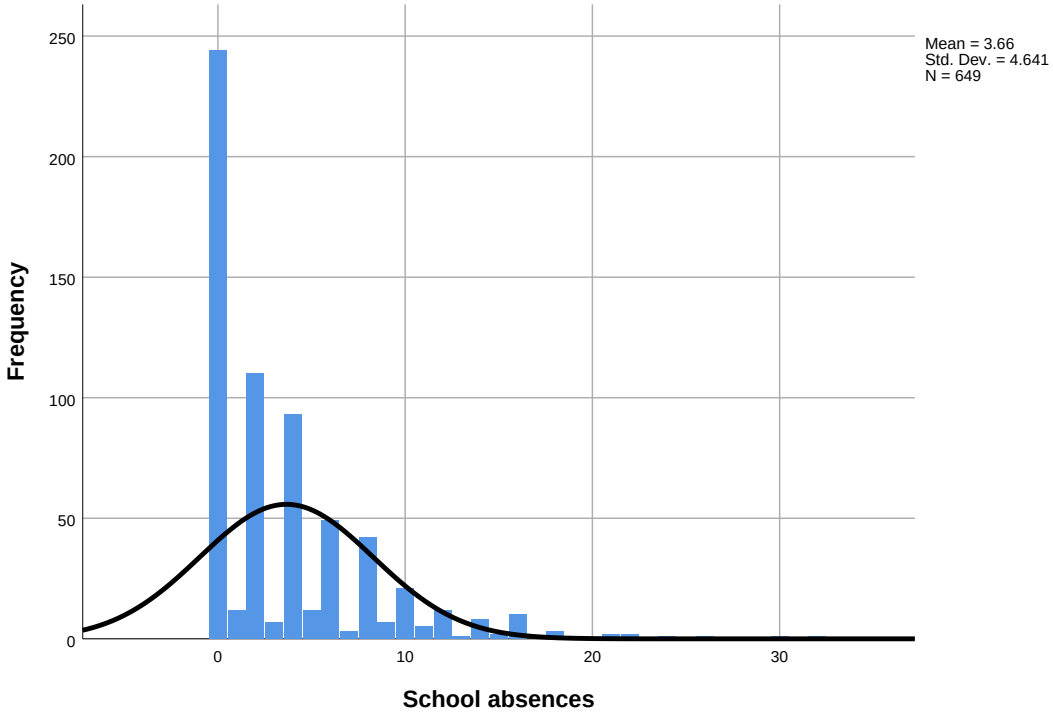
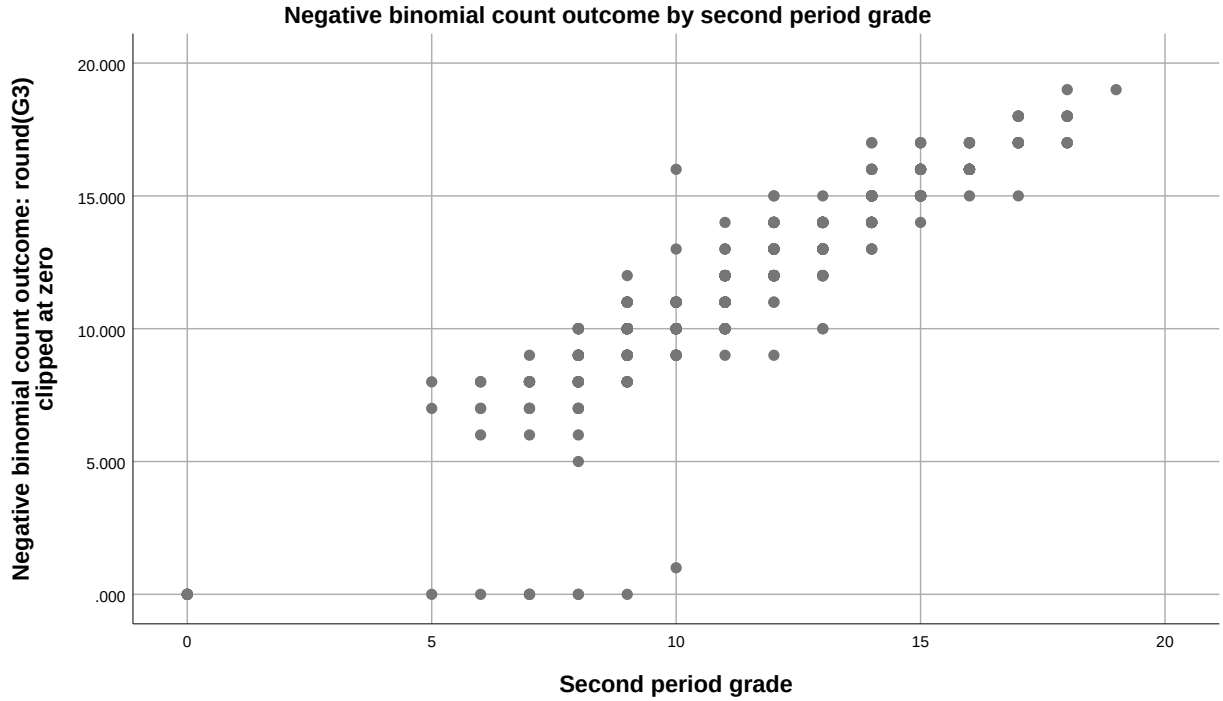


Graph

Notes

Output Created		11-JUL-2026 19:28:09
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /SCATTERPLOT(BIVAR) =G2 WITH nb_count /TITLE='Negative binomial count outcome by second period grade'.
Resources	Processor Time	00:00:00.70
	Elapsed Time	00:00:01.17

Negative Binomial Regression
Count outcome diagnostics



Graph

Negative Binomial Regression
Count outcome diagnostics

Notes

Output Created		11-JUL-2026 19:28:10
Comments		
Input	Data	D:\DATA ANALYSIS\H Regression Tests and Models\Negative Binomial Regression\dataset.csv
	Active Dataset	NBRData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /SCATTERPLOT(BIVAR) =G1 WITH nb_count /TITLE='Negative binomial count outcome by first period grade'.
Resources	Processor Time	00:00:00.62
	Elapsed Time	00:00:00.97

Negative Binomial Regression
Count outcome diagnostics