

The CONTENTS Procedure

Data Set Name	WORK.STUDENTS	Observations	1044
Member Type	DATA	Variables	34
Engine	V9	Indexes	0
Created	04/29/2024 15:23:08	Observation Length	224
Last Modified	04/29/2024 15:23:08	Deleted Observations	0
Protection		Compressed	NO
Data Set Type		Sorted	NO
Label			
Data Representation	SOLARIS_X86_64, LINUX_X86_64, ALPHA_TRU64, LINUX_IA64		
Encoding	utf-8 Unicode (UTF-8)		

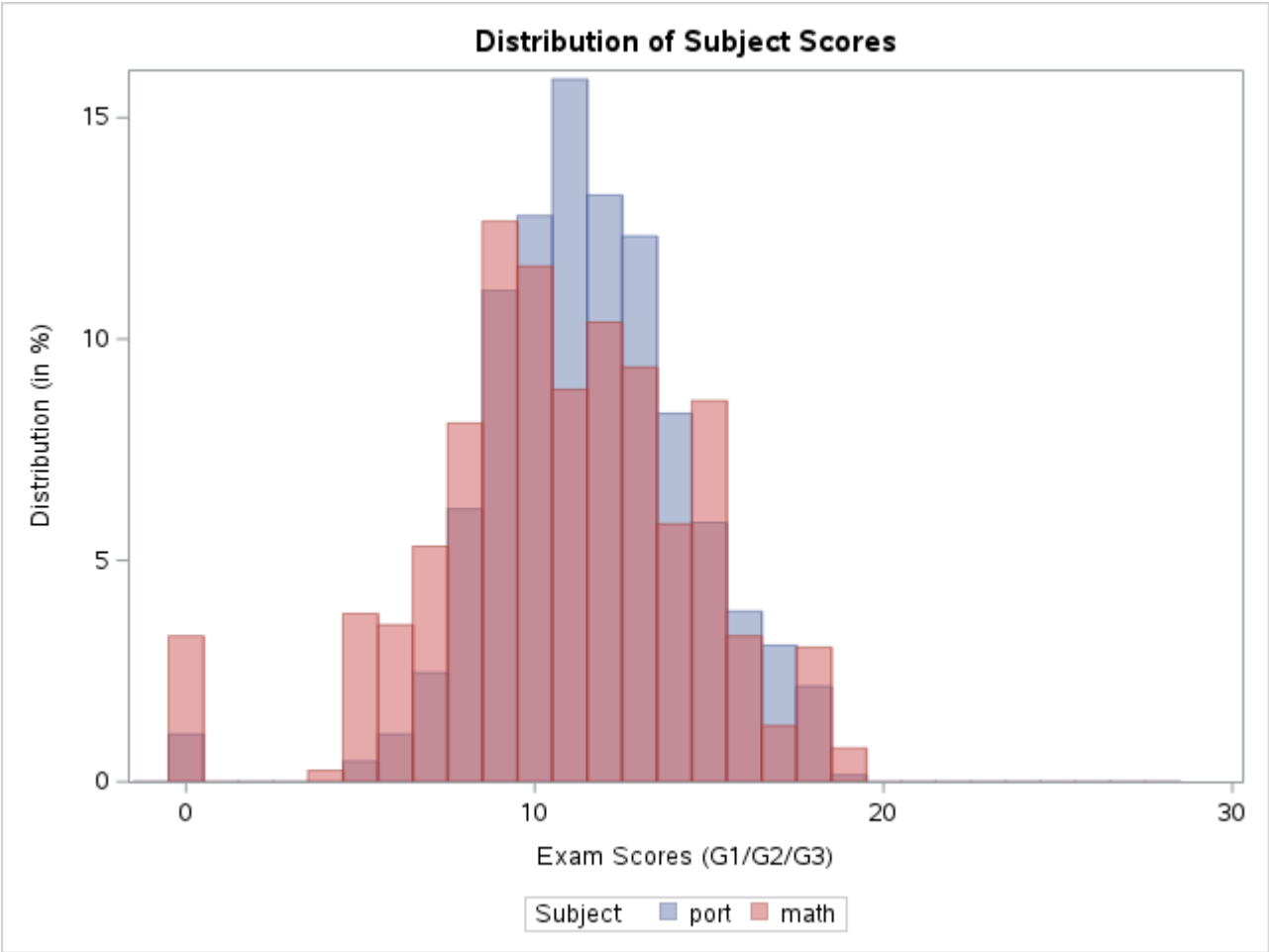
Engine/Host Dependent Information	
Data Set Page Size	131072
Number of Data Set Pages	2
First Data Page	1
Max Obs per Page	584
Obs in First Data Page	556
Number of Data Set Repairs	0
Filename	/saswork/SAS_work4FC400009B58_odaws02-usw2.oda.sas.com/SAS_work389E00009B58_odaws02-usw2.oda.sas.com/students.sas7bdat
Release Created	9.0401M7
Host Created	Linux
Inode Number	1075166704
Access Permission	rw-r--r--
Owner Name	u62534565
File Size	384KB
File Size (bytes)	393216

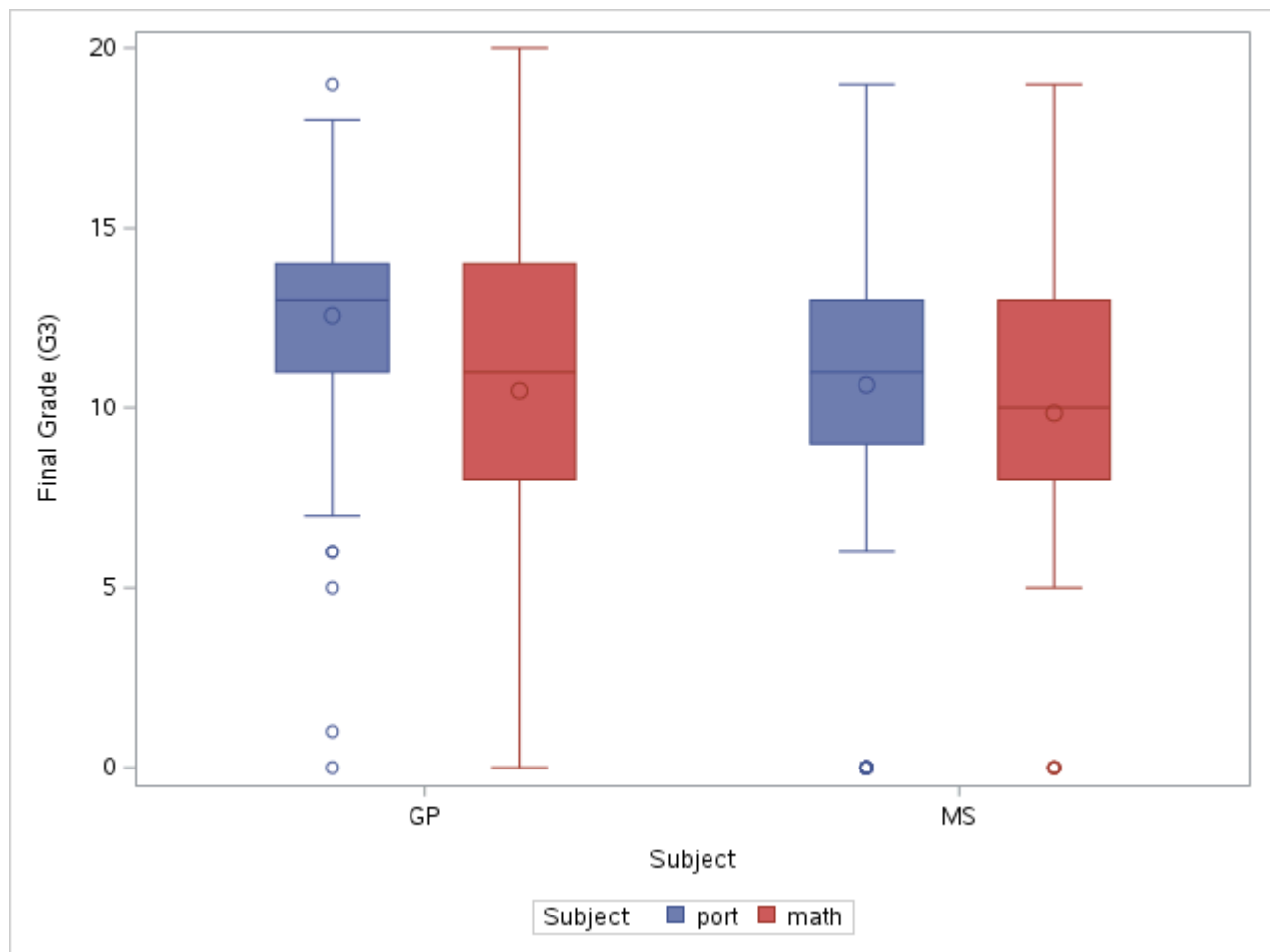
Alphabetic List of Variables and Attributes					
#	Variable	Type	Len	Format	Informat
27	Dalc	Num	8	BEST12.	BEST32.
8	Fedu	Num	8	BEST12.	BEST32.
10	Fjob	Char	10	\$10.	\$10.
31	G1	Char	4	\$4.	\$4.
32	G2	Char	4	\$4.	\$4.
33	G3	Num	8	BEST12.	BEST32.
7	Medu	Num	8	BEST12.	BEST32.
9	Mjob	Char	10	\$10.	\$10.
6	Pstatus	Char	3	\$3.	\$3.
28	Walc	Num	8	BEST12.	BEST32.
30	absences	Num	8	BEST12.	BEST32.
19	activities	Char	5	\$5.	\$5.
4	address	Char	3	\$3.	\$3.
3	age	Num	8	BEST12.	BEST32.
15	failures	Num	8	BEST12.	BEST32.
24	famrel	Num	8	BEST12.	BEST32.
5	famsize	Char	5	\$5.	\$5.

Alphabetic List of Variables and Attributes					
#	Variable	Type	Len	Format	Informat
17	famsup	Char	5	\$5.	\$5.
25	freetime	Num	8	BEST12.	BEST32.
26	goout	Num	8	BEST12.	BEST32.
12	guardian	Char	8	\$8.	\$8.
29	health	Num	8	BEST12.	BEST32.
21	higher	Char	5	\$5.	\$5.
22	internet	Char	5	\$5.	\$5.
20	nursery	Char	5	\$5.	\$5.
18	paid	Char	5	\$5.	\$5.
11	reason	Char	12	\$12.	\$12.
23	romantic	Char	5	\$5.	\$5.
1	school	Char	4	\$4.	\$4.
16	schoolsup	Char	5	\$5.	\$5.
2	sex	Char	3	\$3.	\$3.
14	studytime	Num	8	BEST12.	BEST32.
34	subject	Char	4	\$5.	
13	traveltime	Num	8	BEST12.	BEST32.

Variables in Creation Order					
#	Variable	Type	Len	Format	Informat
1	school	Char	4	\$4.	\$4.
2	sex	Char	3	\$3.	\$3.
3	age	Num	8	BEST12.	BEST32.
4	address	Char	3	\$3.	\$3.
5	famsize	Char	5	\$5.	\$5.
6	Pstatus	Char	3	\$3.	\$3.
7	Medu	Num	8	BEST12.	BEST32.
8	Fedu	Num	8	BEST12.	BEST32.
9	Mjob	Char	10	\$10.	\$10.
10	Fjob	Char	10	\$10.	\$10.
11	reason	Char	12	\$12.	\$12.
12	guardian	Char	8	\$8.	\$8.
13	traveltime	Num	8	BEST12.	BEST32.
14	studytime	Num	8	BEST12.	BEST32.
15	failures	Num	8	BEST12.	BEST32.
16	schoolsup	Char	5	\$5.	\$5.
17	famsup	Char	5	\$5.	\$5.
18	paid	Char	5	\$5.	\$5.
19	activities	Char	5	\$5.	\$5.
20	nursery	Char	5	\$5.	\$5.
21	higher	Char	5	\$5.	\$5.
22	internet	Char	5	\$5.	\$5.
23	romantic	Char	5	\$5.	\$5.
24	famrel	Num	8	BEST12.	BEST32.
25	freetime	Num	8	BEST12.	BEST32.
26	goout	Num	8	BEST12.	BEST32.
27	Dalc	Num	8	BEST12.	BEST32.

Variables in Creation Order					
#	Variable	Type	Len	Format	Informat
28	Walc	Num	8	BEST12.	BEST32.
29	health	Num	8	BEST12.	BEST32.
30	absences	Num	8	BEST12.	BEST32.
31	G1	Char	4	\$4.	\$4.
32	G2	Char	4	\$4.	\$4.
33	G3	Num	8	BEST12.	BEST32.
34	subject	Char	4	\$5.	



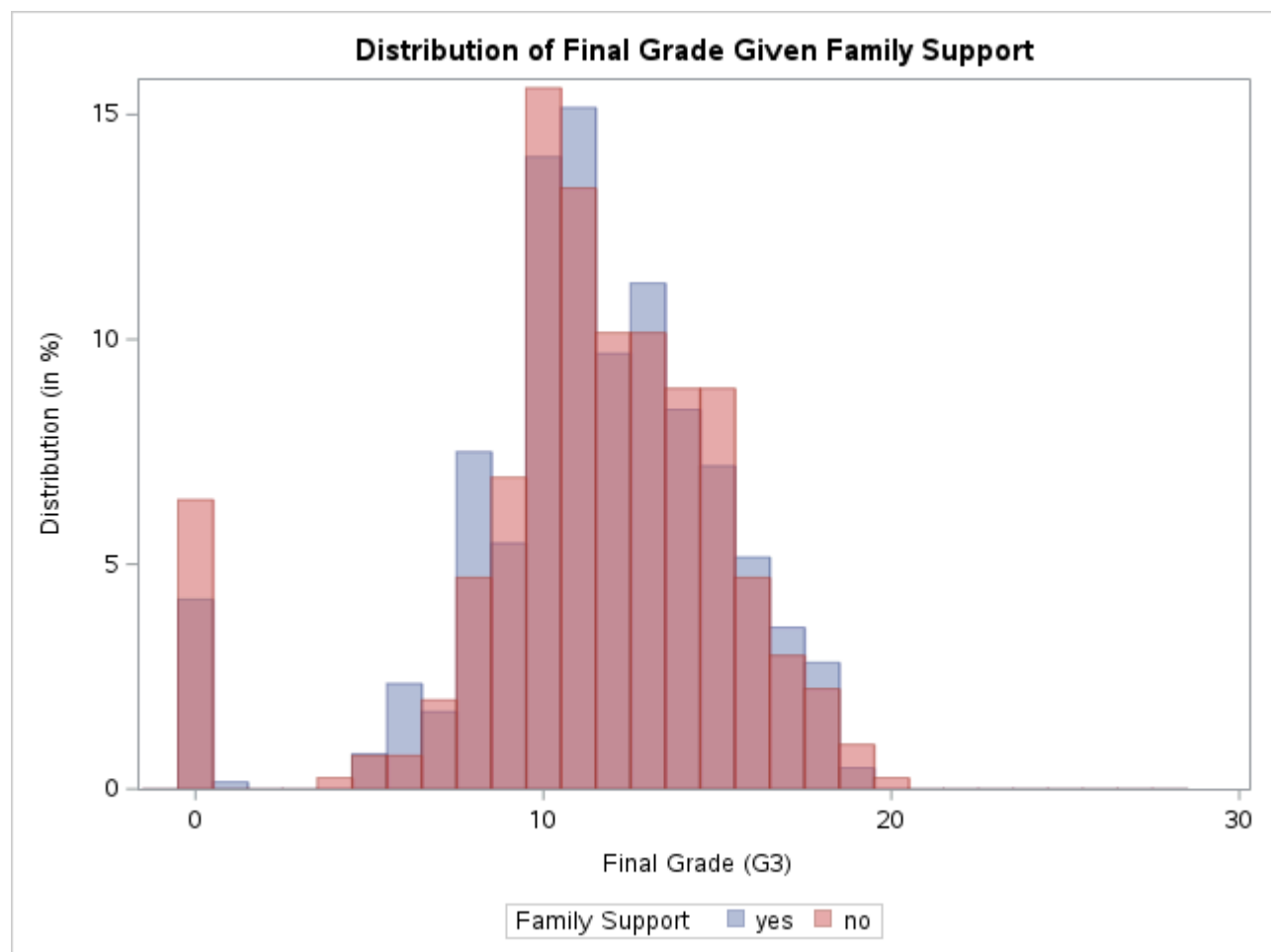


The FREQ Procedure

sex	Frequency	Percent	Cumulative Frequency	Cumulative Percent
F	591	56.61	591	56.61
M	453	43.39	1044	100.00

The MEANS Procedure

Analysis Variable : G3								
sex	famsup	schoolsup	N Obs	N	Mean	Std Dev	Minimum	Maximum
F	no	no	169	169	11.6213018	4.2072523	0	19.0000000
		yes	25	25	10.9600000	2.0510160	6.0000000	17.0000000
	yes	no	335	335	11.5641791	3.9481558	0	19.0000000
		yes	62	62	10.5483871	2.8896504	0	18.0000000
M	no	no	203	203	11.0837438	4.1467967	0	20.0000000
		yes	7	7	9.7142857	1.6035675	8.0000000	12.0000000
	yes	no	218	218	11.4908257	3.6710862	0	19.0000000
		yes	25	25	10.0800000	3.0675723	0	15.0000000



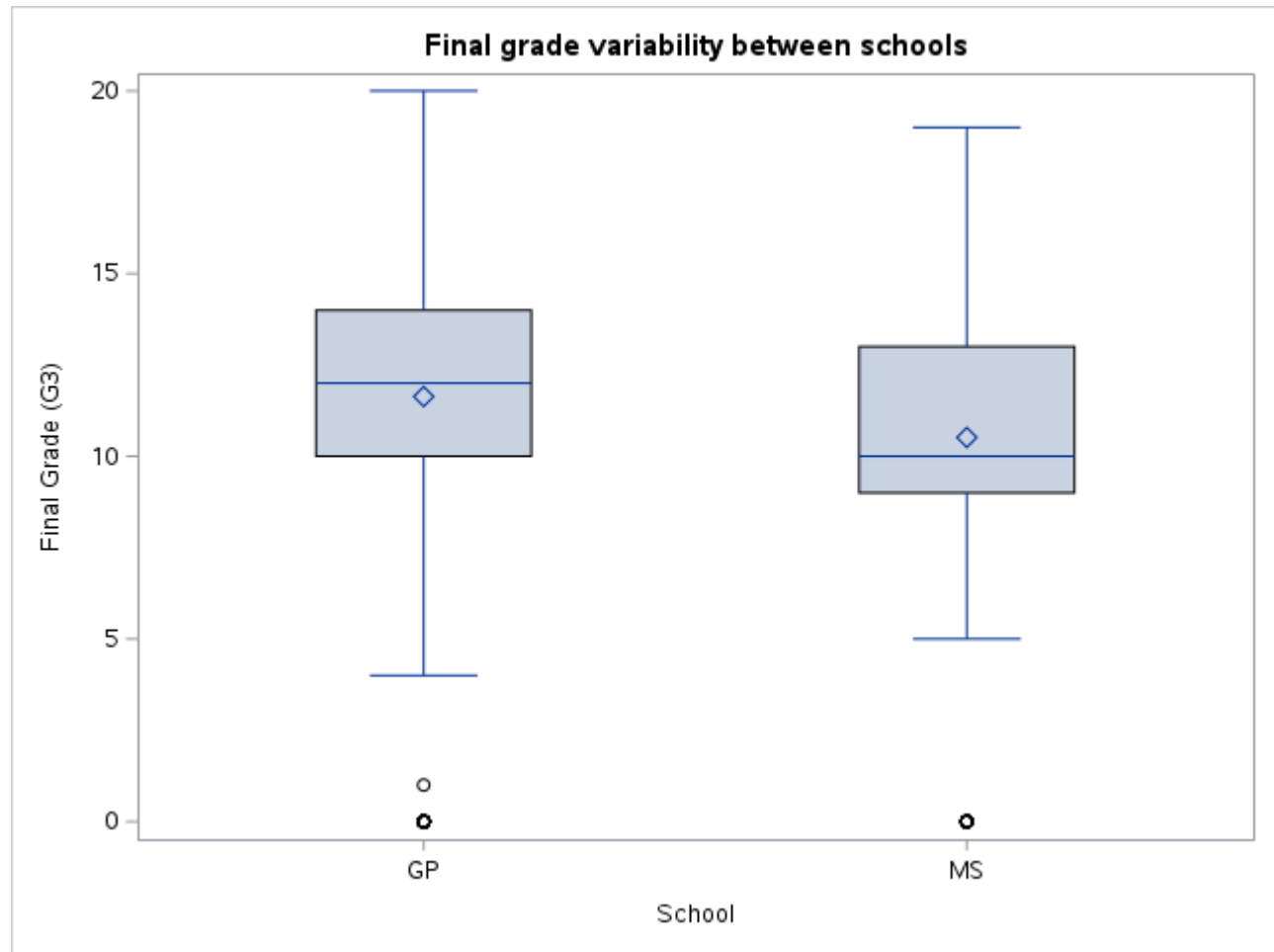
The FREQ Procedure

Frequency Percent Row Pct Col Pct	Table of school by schoolsup		
	schoolsup		
school	no	yes	Total
GP	665	107	772
	63.70	10.25	73.95
	86.14	13.86	
	71.89	89.92	
MS	260	12	272
	24.90	1.15	26.05
	95.59	4.41	
	28.11	10.08	
Total	925	119	1044
	88.60	11.40	100.00

The MEANS Procedure

Analysis Variable : G3						
school	schoolsup	N Obs	Mean	Std Dev	Minimum	Maximum
GP	no	665	11.823	3.949	0.000	20.000
	yes	107	10.458	2.500	0.000	17.000
MS	no	260	10.504	3.899	0.000	19.000

Analysis Variable : G3						
school	schoolsup	N Obs	Mean	Std Dev	Minimum	Maximum
	yes	12	10.750	4.288	0.000	18.000



The UNIVARIATE Procedure
Variable: absences

Moments			
N	1044	Sum Weights	1044
Mean	4.4348659	Sum Observations	4630
Std Deviation	6.21001656	Variance	38.5643057
Skewness	3.7413466	Kurtosis	26.5962003
Uncorrected SS	60756	Corrected SS	40222.5709
Coeff Variation	140.027155	Std Error Mean	0.19219519

Basic Statistical Measures			
Location		Variability	
Mean	4.434866	Std Deviation	6.21002
Median	2.000000	Variance	38.56431
Mode	0.000000	Range	75.00000
		Interquartile Range	6.00000

Tests for Location: Mu0=0				
Test	Statistic		p Value	
Student's t	t	23.0748	Pr > |t|	<.0001
Sign	M	342.5	Pr >= |M|	<.0001
Signed Rank	S	117477.5	Pr >= |S|	<.0001

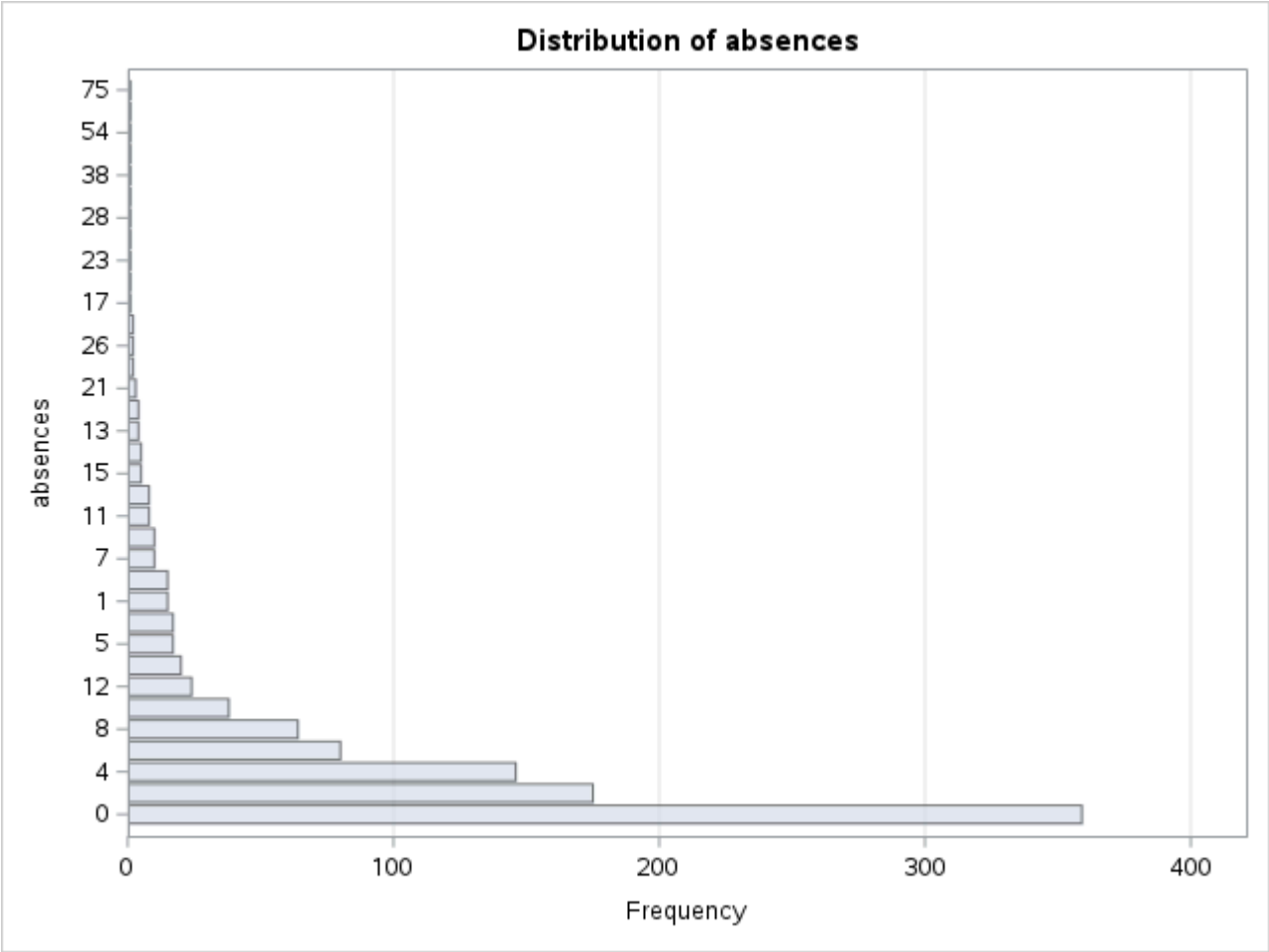
Quantiles (Definition 5)	
Level	Quantile
100% Max	75
99%	26
95%	16
90%	12
75% Q3	6
50% Median	2
25% Q1	0
10%	0
5%	0
1%	0
0% Min	0

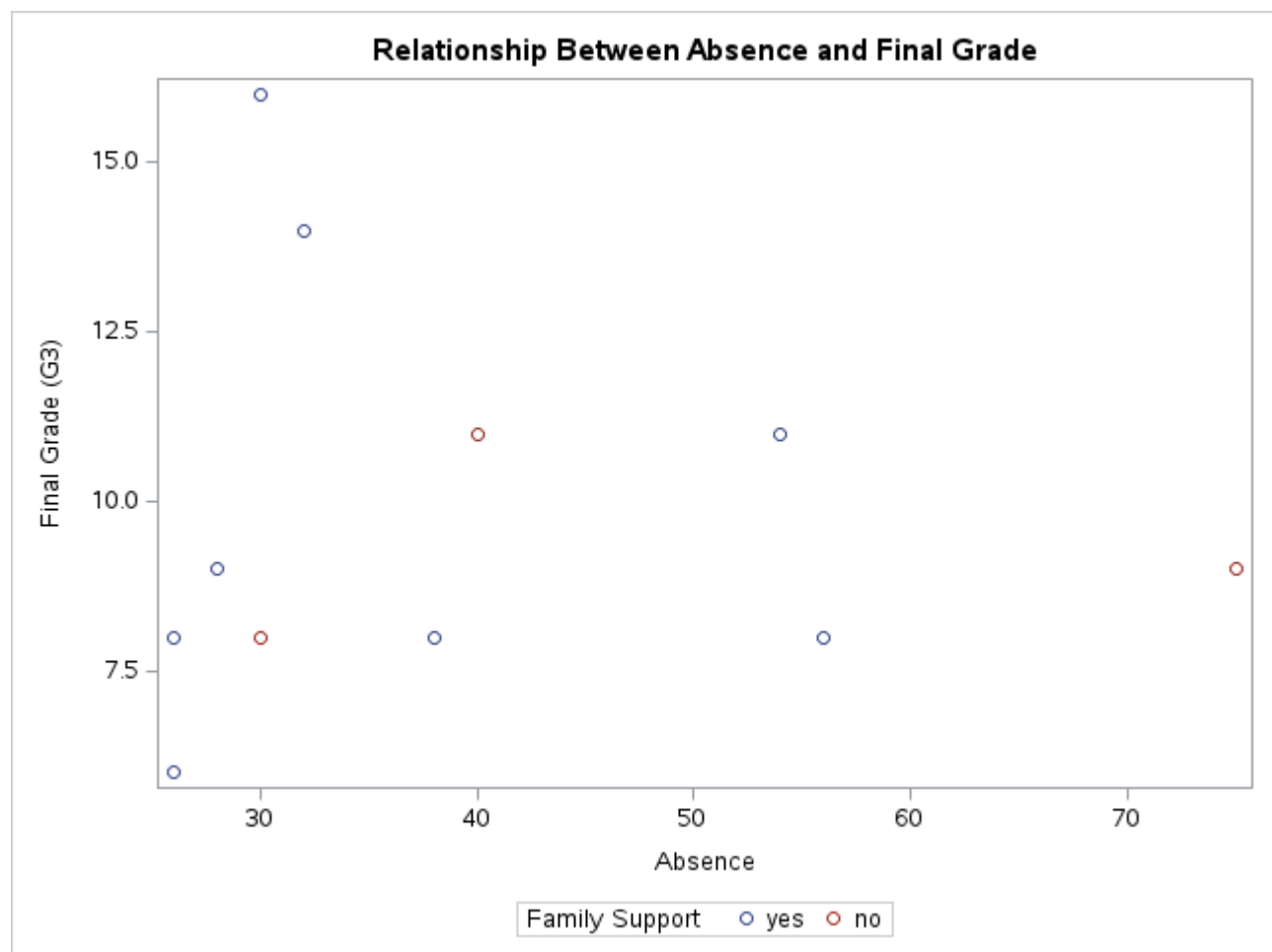
Extreme Observations			
Lowest		Highest	
Value	Obs	Value	Obs
0	1037	38	765
0	1036	40	396
0	1031	54	141
0	1030	56	313
0	1026	75	319

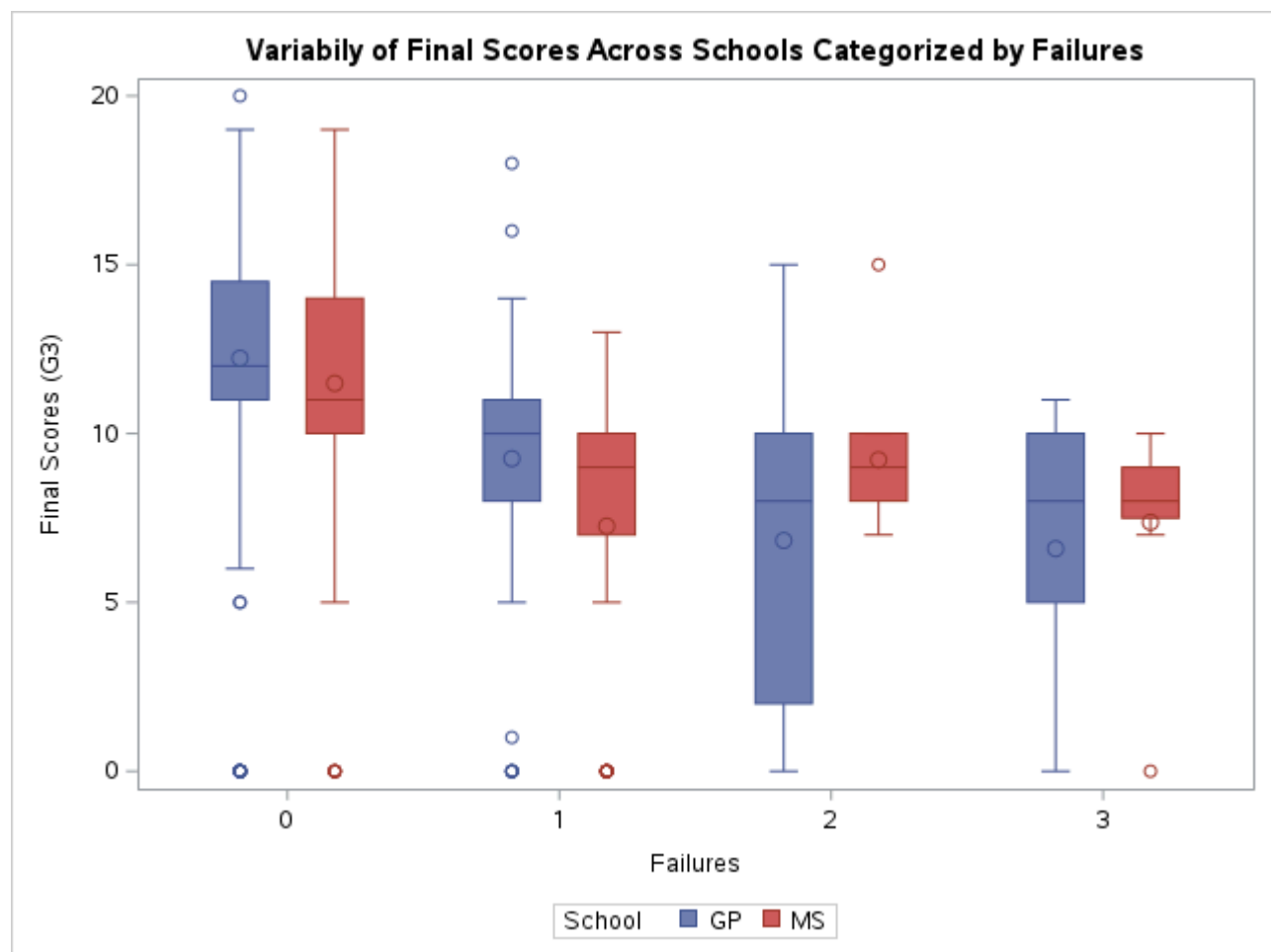
The FREQ Procedure

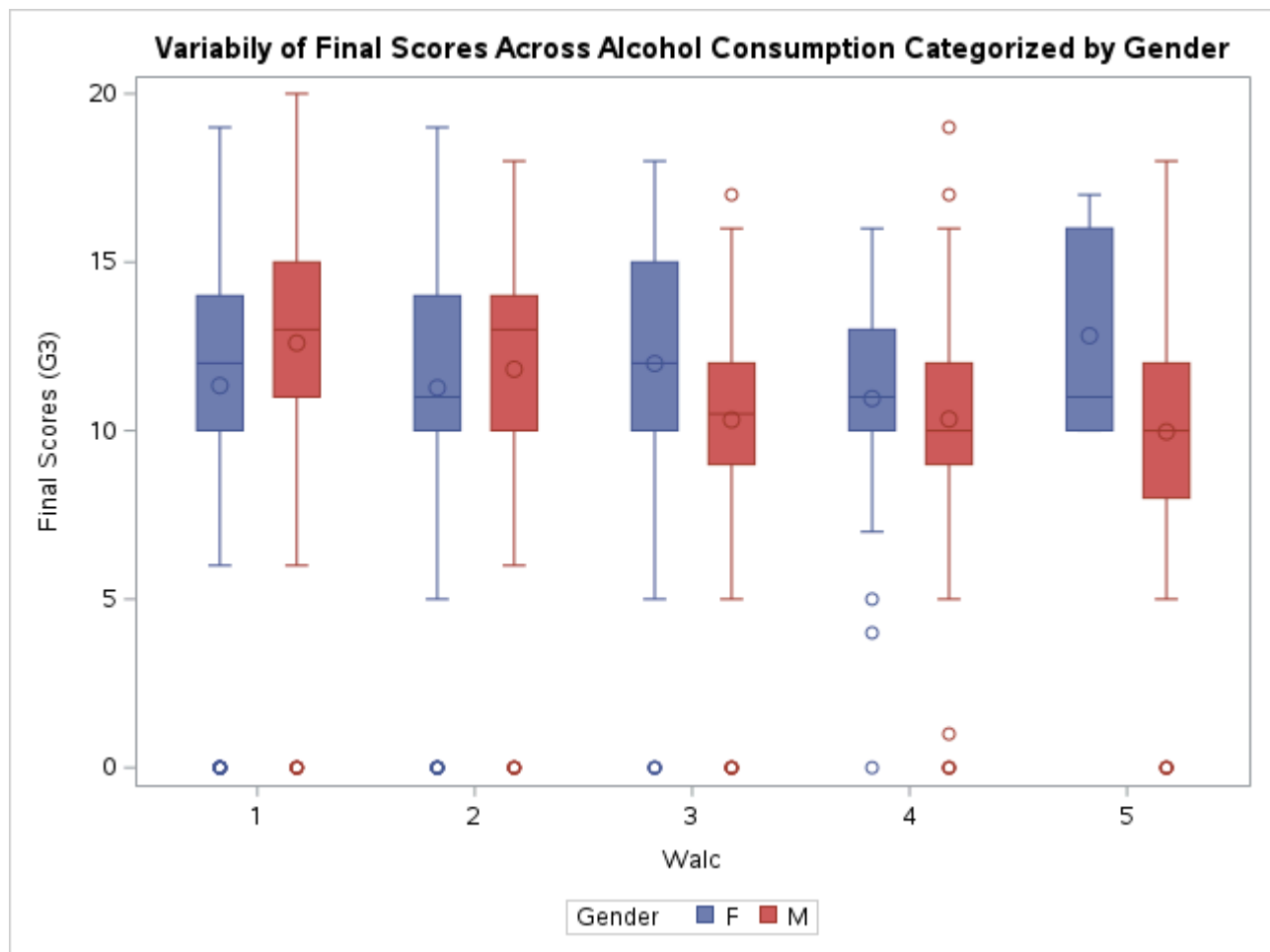
absences	Frequency	Percent
0	359	34.39
2	175	16.76
4	146	13.98
6	80	7.66
8	64	6.13
10	38	3.64
12	24	2.30
14	20	1.92
5	17	1.63
16	17	1.63
1	15	1.44
3	15	1.44
7	10	0.96
9	10	0.96
11	8	0.77
18	8	0.77

absences	Frequency	Percent
15	5	0.48
22	5	0.48
13	4	0.38
20	4	0.38
21	3	0.29
24	2	0.19
26	2	0.19
30	2	0.19
17	1	0.10
19	1	0.10
23	1	0.10
25	1	0.10
28	1	0.10
32	1	0.10
38	1	0.10
40	1	0.10
54	1	0.10
56	1	0.10
75	1	0.10





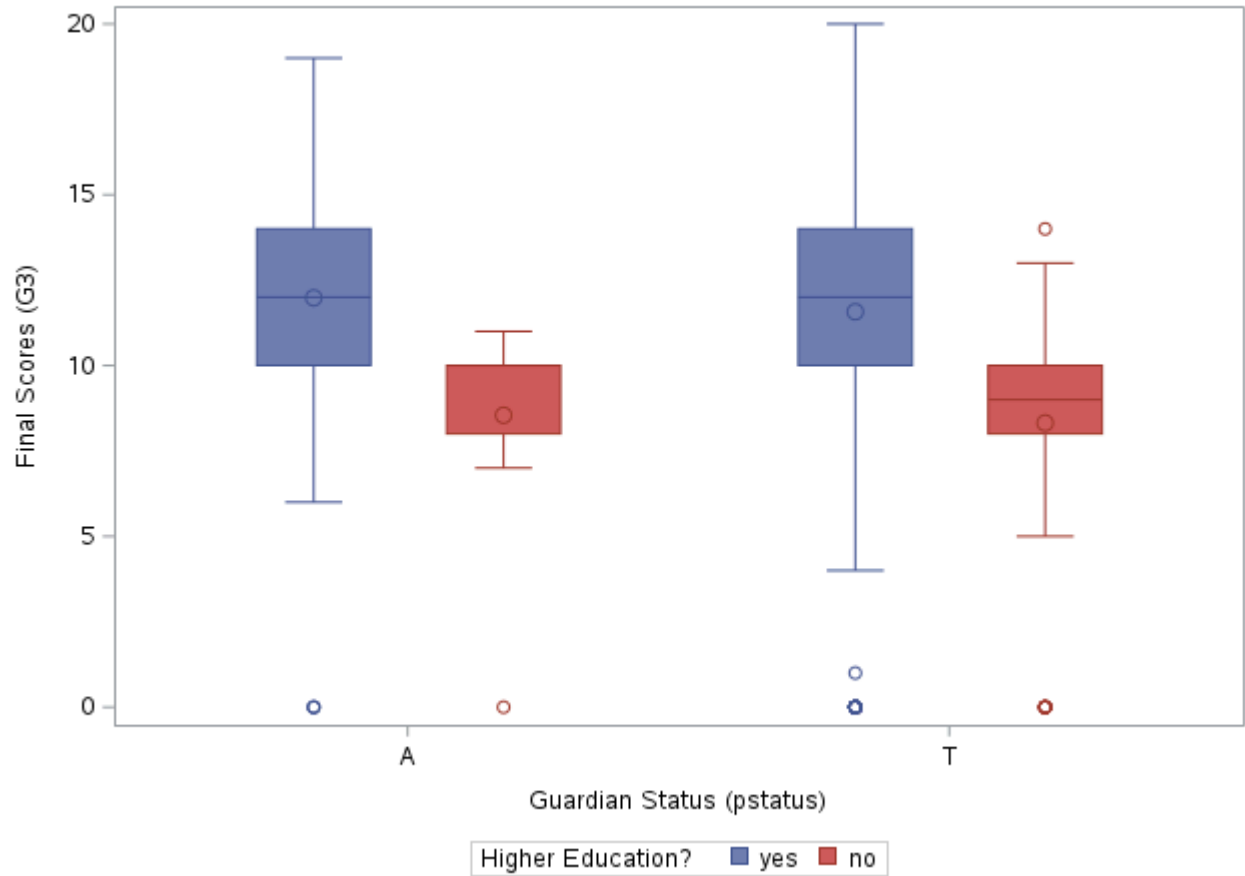




The MEANS Procedure

Analysis Variable : G3							
Walch	sex	N Obs	N	Mean	Std Dev	Minimum	Maximum
1	F	270	270	11.337	3.996	0.000	19.000
	M	128	128	12.602	4.032	0.000	20.000
2	F	150	150	11.273	4.056	0.000	19.000
	M	85	85	11.824	3.883	0.000	18.000
3	F	116	116	11.991	3.689	0.000	18.000
	M	84	84	10.321	3.475	0.000	17.000
4	F	44	44	10.955	3.019	0.000	16.000
	M	94	94	10.340	3.258	0.000	19.000
5	F	11	11	12.818	2.786	10.000	17.000
	M	62	62	9.968	3.785	0.000	18.000

Relationship between Guardian Status, Higher Education Aspiration, and Final Scores



The GLMSELECT Procedure

Data Set	WORK.STUDENTS
Dependent Variable	G3
Selection Method	Stepwise
Select Criterion	SBC
Stop Criterion	None
Effect Hierarchy Enforced	None

Number of Observations Read	1044
Number of Observations Used	1044

Class Level Information		
Class	Levels	Values
sex	2	F M
address	2	R U
famsize	2	GT3 LE3
Pstatus	2	A T
Medu	5	0 1 2 3 4
Fedu	5	0 1 2 3 4
Mjob	5	at_home health other services teacher
Fjob	5	at_home health other services teacher
reason	4	course home other reputation

Class Level Information		
Class	Levels	Values
guardian	3	father mother other
schoolsup	2	no yes
famsup	2	no yes
paid	2	no yes
activities	2	no yes
nursery	2	no yes
higher	2	no yes
internet	2	no yes
romantic	2	no yes
subject	2	math port

Dimensions	
Number of Effects	33
Number of Parameters	67

The GLMSELECT Procedure

Stepwise Selection Summary					
Step	Effect Entered	Effect Removed	Number Effects In	Number Parm's In	SBC
0	Intercept		1	1	2828.7360
1	G2		2	2	989.1170
2	subject		3	3	963.3152
3	G1		4	4	949.5348
4	absences		5	5	940.5029
5	failures		6	6	938.3318*
* Optimal Value of Criterion					

Selection stopped as adding or dropping any effect does not improve the selection criterion.

The GLMSELECT Procedure Selected Model

The selected model is the model at the last step (Step 5).

Effects:	Intercept failures absences subject G1 G2
-----------------	---

Analysis of Variance				
Source	DF	Sum of Squares	Mean Square	F Value
Model	5	13115	2622.92952	1104.83
Error	1038	2464.27481	2.37406	
Corrected Total	1043	15579		

Root MSE	1.54080
Dependent Mean	11.34195
R-Square	0.8418
Adj R-Sq	0.8411

AIC	1954.62696
AICC	1954.73506
SBC	938.33185

Parameter Estimates				
Parameter	DF	Estimate	Standard Error	t Value
Intercept	1	-0.602424	0.218769	-2.75
failures	1	-0.239012	0.079192	-3.02
absences	1	0.032872	0.007824	4.20
subject math	1	-0.659918	0.100523	-6.56
subject port	0	0	.	.
G1	1	0.139292	0.031461	4.43
G2	1	0.938053	0.028708	32.68

The CORR Procedure

6 Variables:	failures subj absences g1 g2 G3
---------------------	---------------------------------

Simple Statistics						
Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
failures	1044	0.26437	0.65614	276.00000	0	3.00000
subj	1044	0.37835	0.48521	395.00000	0	1.00000
absences	1044	4.43487	6.21002	4630	0	75.00000
g1	1044	11.21360	2.98339	11707	0	19.00000
g2	1044	11.24617	3.28507	11741	0	19.00000
G3	1044	11.34195	3.86480	11841	0	20.00000

Pearson Correlation Coefficients, N = 1044 Prob > |r| under H0: Rho=0						
	failures	subj	absences	g1	g2	G3
failures	1.00000	0.08304 0.0073	0.10000 0.0012	-0.37417 <.0001	-0.37717 <.0001	-0.38315 <.0001
subj	0.08304 0.0073	1.00000	0.16013 <.0001	-0.07973 0.0100	-0.12646 <.0001	-0.18717 <.0001
absences	0.10000 0.0012	0.16013 <.0001	1.00000	-0.09242 0.0028	-0.08933 0.0039	-0.04567 0.1403
g1	-0.37417 <.0001	-0.07973 0.0100	-0.09242 0.0028	1.00000	0.85874 <.0001	0.80914 <.0001
g2	-0.37717 <.0001	-0.12646 <.0001	-0.08933 0.0039	0.85874 <.0001	1.00000	0.91074 <.0001
G3	-0.38315 <.0001	-0.18717 <.0001	-0.04567 0.1403	0.80914 <.0001	0.91074 <.0001	1.00000

The Mixed Procedure

Model Information	
Data Set	WORK.SELECTED_FEATURES
Dependent Variable	G3
Covariance Structure	Variance Components

Model Information	
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Containment

Class Level Information		
Class	Levels	Values
school	2	GP MS
absences	35	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 28 30 32 38 40 54 56 75
subject	2	math port
failures	4	0 1 2 3

Dimensions	
Covariance Parameters	3
Columns in X	52
Columns in Z	3
Subjects	1
Max Obs per Subject	1044

Number of Observations	
Number of Observations Read	1044
Number of Observations Used	1044
Number of Observations Not Used	0

Iteration History			
Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	3766.43285802	
1	1	3766.43285802	0.00000000

Convergence criteria met but final Hessian is not positive definite.

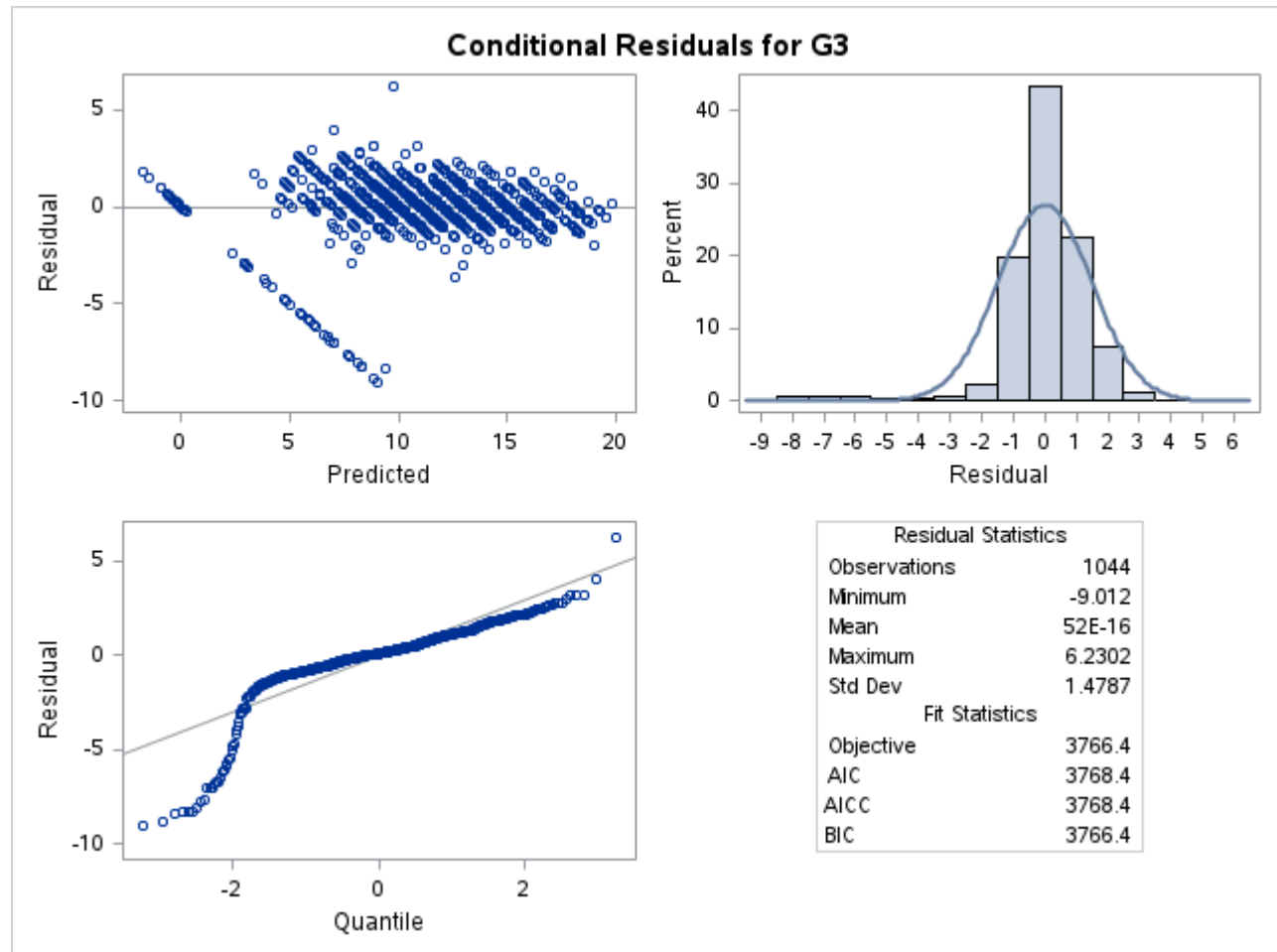
Estimated G matrix is not positive definite.

Covariance Parameter Estimates							
Cov Parm	Estimate	Standard Error	Z Value	Pr > Z	Alpha	Lower	Upper
Intercept	0	.	.	.	.	.	.
school	0	.	.	.	.	.	.
Residual	2.2805	0.1020	22.36	<.0001	0.1	2.1220	2.4585

Fit Statistics	
-2 Res Log Likelihood	3766.4
AIC (Smaller is Better)	3768.4
AICC (Smaller is Better)	3768.4
BIC (Smaller is Better)	3766.4

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
failures	3	999	7.45	<.0001

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
subject	1	999	18.88	<.0001
absences	34	999	2.53	<.0001
subject*failures	3	999	2.21	0.0850
G1	1	999	27.70	<.0001
G2	1	999	1001.97	<.0001



The Mixed Procedure

Model Information	
Data Set	WORK.NOZEROS
Dependent Variable	G3
Covariance Structure	Variance Components
Estimation Method	REML
Residual Variance Method	Profile
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Containment

Class Level Information		
Class	Levels	Values
school	2	GP MS
absences	35	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 28 30 32 38 40 54 56 75

Class Level Information		
Class	Levels	Values
subject	2	math port
failures	4	0 1 2 3

Dimensions	
Covariance Parameters	3
Columns in X	52
Columns in Z	3
Subjects	1
Max Obs per Subject	991

Number of Observations	
Number of Observations Read	991
Number of Observations Used	991
Number of Observations Not Used	0

Iteration History			
Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	2577.26721649	
1	1	2577.26721649	0.00000000

Convergence criteria met but final Hessian is not positive definite.

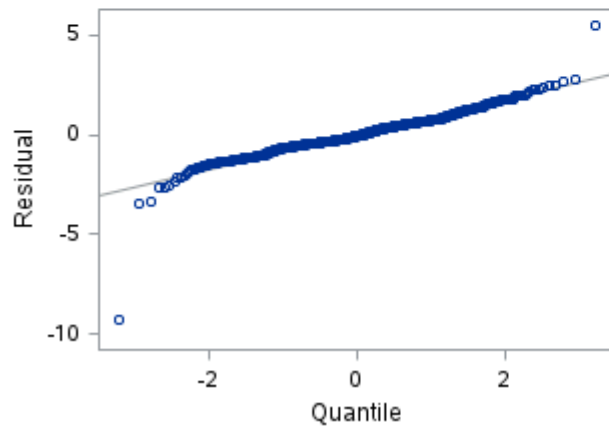
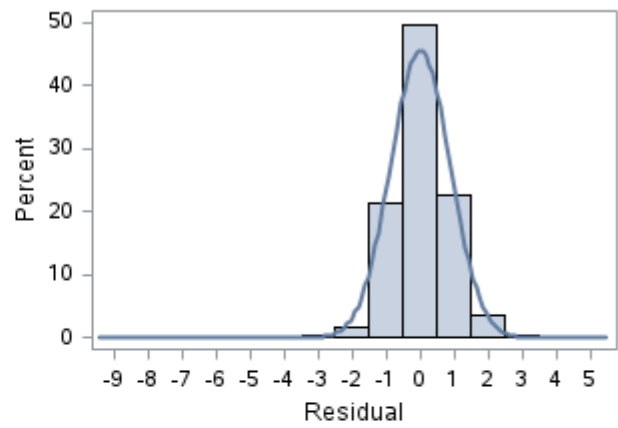
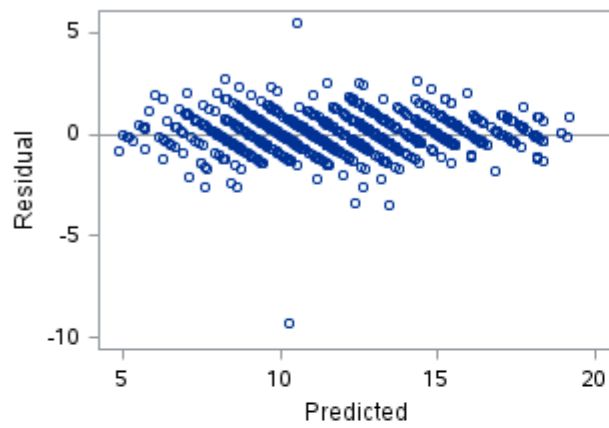
Estimated G matrix is not positive definite.

Covariance Parameter Estimates							
Cov Parm	Estimate	Standard Error	Z Value	Pr > Z	Alpha	Lower	Upper
Intercept	0	.	.	.	.	.	.
school	0	.	.	.	.	.	.
Residual	0.7993	0.03673	21.76	<.0001	0.1	0.7423	0.8635

Fit Statistics	
-2 Res Log Likelihood	2577.3
AIC (Smaller is Better)	2579.3
AICC (Smaller is Better)	2579.3
BIC (Smaller is Better)	2577.3

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
failures	3	946	1.26	0.2856
subject	1	946	1.30	0.2540
absences	34	946	0.93	0.5857
subject*failures	3	946	2.93	0.0326
G1	1	946	57.91	<.0001
G2	1	946	1246.66	<.0001

Conditional Residuals for G3



Residual Statistics	
Observations	991
Minimum	-9.273
Mean	23E-16
Maximum	5.4829
Std Dev	0.8744
Fit Statistics	
Objective	2577.3
AIC	2579.3
AICC	2579.3
BIC	2577.3