

Host

Notes

Output Created		22-JUN-2026 23:24:52
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax	HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output" mkdir "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output"'].	
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.08

Host

Notes

Output Created		22-JUN-2026 23:24:52
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax	HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\sav" mkdir "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\sav"'].	
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.10

Host

Notes

Output Created		22-JUN-2026 23:24:52
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax	HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\spv" mkdir "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\spv"'].	
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.11

Host

Notes

Output Created		22-JUN-2026 23:24:52
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax	HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\pdf" mkdir "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\pdf"'].	
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.12

Host

Notes

Output Created		22-JUN-2026 23:24:52
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax	HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\png" mkdir "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\png"'].	
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.08

Host

Notes

Output Created		22-JUN-2026 23:24:53
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax	HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\csv" mkdir "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\csv"'].	
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.08

Host

Notes

Output Created		22-JUN-2026 23:24:53
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax	HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_ Output\txt" mkdir "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_...	
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.09

Host

Notes

Output Created		22-JUN-2026 23:24:53
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c echo SPSS MANCOVA script started > "D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_Output\txt\SPSS_SCRIPT_STARTED.txt"].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.10

sex into sex_num (Student sex)

Old Value New Value Value Label

F 1 F

M 2 M

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

File Information

Notes

Output Created		22-JUN-2026 23:24:53
Comments		
Input	Data	D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_Output\sav\mancova_spss_ready_data.sav
	Active Dataset	MANCOVADData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		DISPLAY DICTIONARY.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

[MANCOVADData] D:\DATA ANALYSIS\E ANOVA Family\MANCOVA\SPSS_Output\sav\mancova_spss_ready_data.sav

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Variable Information

Variable	Position	Label	Measurement Level	Role	Column Width	Alignment
school	1	<none>	Nominal	Input	10	Left
sex	2	Student sex	Nominal	Input	10	Left
age	3	<none>	Scale	Input	8	Right
address	4	<none>	Nominal	Input	10	Left
famsize	5	<none>	Nominal	Input	10	Left
Pstatus	6	<none>	Nominal	Input	10	Left
Medu	7	<none>	Nominal	Input	8	Right
Fedu	8	<none>	Nominal	Input	8	Right
Mjob	9	<none>	Nominal	Input	20	Left
Fjob	10	<none>	Nominal	Input	20	Left
reason	11	<none>	Nominal	Input	20	Left
guardian	12	<none>	Nominal	Input	20	Left
travelttime	13	<none>	Nominal	Input	8	Right
studytime	14	<none>	Nominal	Input	8	Right
failures	15	<none>	Nominal	Input	8	Right
schoolsup	16	<none>	Nominal	Input	10	Left
famsup	17	<none>	Nominal	Input	10	Left
paid	18	<none>	Nominal	Input	10	Left
activities	19	<none>	Nominal	Input	10	Left
nursery	20	<none>	Nominal	Input	10	Left
higher	21	<none>	Nominal	Input	10	Left
internet	22	<none>	Nominal	Input	10	Left
romantic	23	<none>	Nominal	Input	10	Left
famrel	24	<none>	Nominal	Input	8	Right
freetime	25	<none>	Nominal	Input	8	Right
goout	26	<none>	Nominal	Input	8	Right
Dalc	27	<none>	Nominal	Input	8	Right
Walc	28	<none>	Nominal	Input	8	Right
health	29	<none>	Nominal	Input	8	Right
absences	30	Number of school absences	Scale	Input	8	Right

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Variable Information

Variable	Print Format	Write Format
school	A10	A10
sex	A10	A10
age	F8.2	F8.2
address	A10	A10
famsize	A10	A10
Pstatus	A10	A10
Medu	F8.2	F8.2
Fedu	F8.2	F8.2
Mjob	A20	A20
Fjob	A20	A20
reason	A20	A20
guardian	A20	A20
traveltime	F8.2	F8.2
studytime	F8.2	F8.2
failures	F8.2	F8.2
schoolsup	A10	A10
famsup	A10	A10
paid	A10	A10
activities	A10	A10
nursery	A10	A10
higher	A10	A10
internet	A10	A10
romantic	A10	A10
famrel	F8.2	F8.2
freetime	F8.2	F8.2
goout	F8.2	F8.2
Dalc	F8.2	F8.2
Walc	F8.2	F8.2
health	F8.2	F8.2
absences	F8.2	F8.2

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Variable Information

Variable	Position	Label	Measurement Level	Role	Column Width	Alignment
G1	31	First period grade	Nominal	Input	8	Right
G2	32	Second period grade	Nominal	Input	8	Right
G3	33	Final grade score	Nominal	Input	8	Right
sex_num	34	Student sex numeric factor generated from sex	Nominal	Input	9	Right

Variable Information

Variable	Print Format	Write Format
G1	F8.2	F8.2
G2	F8.2	F8.2
G3	F8.2	F8.2
sex_num	F1	F1

Variables in the working file

Variable Values

Value	Label
sex_num 1	F
sex_num 2	M

Descriptives

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Notes

Output Created		22-JUN-2026 23:24:53
Comments		
Input	Data	D:\DATA ANALYSIS\IE ANOVA Family\MANCOVA\SPSS_ Output\sav\mancova_spss_ _ready_data.sav
	Active Dataset	MANCOVAData
	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.
Syntax		DESCRIPTIVES VARIABLES=G1 G2 G3 absences /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.01

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
G1	649	.00	19.00	11.3991	2.74527
G2	649	.00	19.00	11.5701	2.91364
G3	649	.00	19.00	11.9060	3.23066
absences	649	.00	32.00	3.6595	4.64076
Valid N (listwise)	649				

Frequencies

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Notes

Output Created		22-JUN-2026 23:24:53
Comments		
Input	Data	D:\DATA ANALYSIS\IE ANOVA Family\MANCOVA\SPSS_ Output\sav\mancova_spss_ _ready_data.sav
	Active Dataset	MANCOVAData
	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=sex_num /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Statistics

sex_num

N	Valid	649
	Missing	0

sex_num

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	383	59.0	59.0	59.0
	2	266	41.0	41.0	100.0
Total		649	100.0	100.0	

Means

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Notes

Output Created		22-JUN-2026 23:24:53
Comments		
Input	Data	D:\DATA ANALYSIS\IE ANOVA Family\MANCOVA\SPSS_ Output\sav\mancova_spss _ready_data.sav
	Active Dataset	MANCOVAData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	For each dependent variable in a table, user-defined missing values for the dependent and all grouping variables are treated as missing.
	Cases Used	Cases used for each table have no missing values in any independent variable, and not all dependent variables have missing values.
Syntax		MEANS TABLES=G1 G2 G3 BY sex_num /CELLS=COUNT MEAN STDDEV MEDIAN MIN MAX.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
G1 * sex_num	649	100.0%	0	0.0%	649	100.0%
G2 * sex_num	649	100.0%	0	0.0%	649	100.0%
G3 * sex_num	649	100.0%	0	0.0%	649	100.0%

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Report

sex_num		G1	G2	G3
1	N	383	383	383
	Mean	11.6371	11.8225	12.2533
	Std. Deviation	2.79423	2.96751	3.12415
	Median	12.0000	12.0000	12.0000
	Minimum	.00	.00	.00
	Maximum	19.00	19.00	19.00
2	N	266	266	266
	Mean	11.0564	11.2068	11.4060
	Std. Deviation	2.64086	2.80002	3.32069
	Median	11.0000	11.0000	11.0000
	Minimum	4.00	.00	.00
	Maximum	18.00	18.00	19.00
Total	N	649	649	649
	Mean	11.3991	11.5701	11.9060
	Std. Deviation	2.74527	2.91364	3.23066
	Median	11.0000	11.0000	12.0000
	Minimum	.00	.00	.00
	Maximum	19.00	19.00	19.00

Correlations

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Notes

Output Created		22-JUN-2026 23:24:53
Comments		
Input	Data	D:\DATA ANALYSIS\IE ANOVA Family\MANCOVA\SPSS_ Output\sav\mancova_spss _ready_data.sav
	Active Dataset	MANCOVAData
	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=G1 G2 G3 absences /PRINT=TWOTAIL NOSIG /MISSING=PAIRWISE.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.03

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Correlations

		G1	G2	G3	absences
G1	Pearson Correlation	1	.865**	.826**	-.147**
	Sig. (2-tailed)		.000	.000	.000
	N	649	649	649	649
G2	Pearson Correlation	.865**	1	.919**	-.125**
	Sig. (2-tailed)	.000		.000	.001
	N	649	649	649	649
G3	Pearson Correlation	.826**	.919**	1	-.091*
	Sig. (2-tailed)	.000	.000		.020
	N	649	649	649	649
absences	Pearson Correlation	-.147**	-.125**	-.091*	1
	Sig. (2-tailed)	.000	.001	.020	
	N	649	649	649	649

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

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

General Linear Model

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Notes

Output Created		22-JUN-2026 23:24:54
Comments		
Input	Data	D:\DATA ANALYSIS\IE ANOVA Family\MANCOVA\SPSS_ Output\sav\mancova_spss_ _ready_data.sav
	Active Dataset	MANCOVAData
	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 for all variables in the model.
Syntax		GLM G1 G2 G3 BY sex_num WITH absences /METHOD=SSTYPE(3) /INTERCEPT=INCLUDE /PRINT=DESCRIPTIVE ETASQ HOMOGENEITY PARAMETER /EMMEANS=TABLES (sex_num) WITH (absences=MEAN) /CRITERIA=ALPHA(.05) /DESIGN=absences sex_num.
Resources	Processor Time	00:00:00.05
	Elapsed Time	00:00:00.06

Between-Subjects Factors

		Value Label	N
sex_num	1	F	383
	2	M	266

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Descriptive Statistics

	sex_num	Mean	Std. Deviation	N
G1	1	11.6371	2.79423	383
	2	11.0564	2.64086	266
	Total	11.3991	2.74527	649
G2	1	11.8225	2.96751	383
	2	11.2068	2.80002	266
	Total	11.5701	2.91364	649
G3	1	12.2533	3.12415	383
	2	11.4060	3.32069	266
	Total	11.9060	3.23066	649

Box's Test of Equality of Covariance Matrices^a

Box's M	41.630
F	6.902
df1	6
df2	2213064.321
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + absences + sex_num

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Multivariate Tests^a

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.921	2490.138 ^b	3.000	644.000	.000
	Wilks' Lambda	.079	2490.138 ^b	3.000	644.000	.000
	Hotelling's Trace	11.600	2490.138 ^b	3.000	644.000	.000
	Roy's Largest Root	11.600	2490.138 ^b	3.000	644.000	.000
absences	Pillai's Trace	.027	5.865 ^b	3.000	644.000	.001
	Wilks' Lambda	.973	5.865 ^b	3.000	644.000	.001
	Hotelling's Trace	.027	5.865 ^b	3.000	644.000	.001
	Roy's Largest Root	.027	5.865 ^b	3.000	644.000	.001
sex_num	Pillai's Trace	.018	3.921 ^b	3.000	644.000	.009
	Wilks' Lambda	.982	3.921 ^b	3.000	644.000	.009
	Hotelling's Trace	.018	3.921 ^b	3.000	644.000	.009
	Roy's Largest Root	.018	3.921 ^b	3.000	644.000	.009

Multivariate Tests^a

Effect		Partial Eta Squared
Intercept	Pillai's Trace	.921
	Wilks' Lambda	.921
	Hotelling's Trace	.921
	Roy's Largest Root	.921
absences	Pillai's Trace	.027
	Wilks' Lambda	.027
	Hotelling's Trace	.027
	Roy's Largest Root	.027
sex_num	Pillai's Trace	.018
	Wilks' Lambda	.018
	Hotelling's Trace	.018
	Roy's Largest Root	.018

a. Design: Intercept + absences + sex_num

b. Exact statistic

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Levene's Test of Equality of Error Variances^a

	F	df1	df2	Sig.
G1	1.077	1	647	.300
G2	.553	1	647	.458
G3	.004	1	647	.951

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + absences + sex_num

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F
Corrected Model	G1	155.555 ^a	2	77.778	10.627
	G2	142.128 ^b	2	71.064	8.567
	G3	165.828 ^c	2	82.914	8.119
Intercept	G1	53082.754	1	53082.754	7252.717
	G2	54323.202	1	54323.202	6548.467
	G3	56734.491	1	56734.491	5555.259
absences	G1	102.623	1	102.623	14.021
	G2	82.623	1	82.623	9.960
	G3	53.146	1	53.146	5.204
sex_num	G1	49.810	1	49.810	6.806
	G2	56.525	1	56.525	6.814
	G3	109.354	1	109.354	10.708
Error	G1	4728.084	646	7.319	
	G2	5358.932	646	8.296	
	G3	6597.438	646	10.213	
Total	G1	89214.000	649		
	G2	92381.000	649		
	G3	98761.000	649		
Corrected Total	G1	4883.639	648		
	G2	5501.060	648		
	G3	6763.267	648		

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Tests of Between-Subjects Effects

Source	Dependent Variable	Sig.	Partial Eta Squared
Corrected Model	G1	.000	.032
	G2	.000	.026
	G3	.000	.025
Intercept	G1	.000	.918
	G2	.000	.910
	G3	.000	.896
absences	G1	.000	.021
	G2	.002	.015
	G3	.023	.008
sex_num	G1	.009	.010
	G2	.009	.010
	G3	.001	.016
Error	G1		
	G2		
	G3		
Total	G1		
	G2		
	G3		
Corrected Total	G1		
	G2		
	G3		

a. R Squared = .032 (Adjusted R Squared = .029)

b. R Squared = .026 (Adjusted R Squared = .023)

c. R Squared = .025 (Adjusted R Squared = .021)

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Parameter Estimates

Dependent Variable	Parameter	B	Std. Error	t	Sig.	95% ... Lower Bound
G1	Intercept	11.380	.187	60.827	.000	11.013
	absences	-.086	.023	-3.745	.000	-.131
	[sex_num=1]	.563	.216	2.609	.009	.139
	[sex_num=2]	0 ^a	.	.	.	.
G2	Intercept	11.498	.199	57.722	.000	11.106
	absences	-.077	.024	-3.156	.002	-.125
	[sex_num=1]	.600	.230	2.610	.009	.149
	[sex_num=2]	0 ^a	.	.	.	.
G3	Intercept	11.639	.221	52.664	.000	11.205
	absences	-.062	.027	-2.281	.023	-.115
	[sex_num=1]	.835	.255	3.272	.001	.334
	[sex_num=2]	0 ^a	.	.	.	.

Parameter Estimates

Dependent Variable	Parameter	95% Confidence Upper Bound	Partial Eta Squared
G1	Intercept	11.748	.851
	absences	-.041	.021
	[sex_num=1]	.988	.010
	[sex_num=2]	.	.
G2	Intercept	11.889	.838
	absences	-.029	.015
	[sex_num=1]	1.052	.010
	[sex_num=2]	.	.
G3	Intercept	12.073	.811
	absences	-.009	.008
	[sex_num=1]	1.336	.016
	[sex_num=2]	.	.

a. This parameter is set to zero because it is redundant.

Estimated Marginal Means

MANCOVA: G1, G2, and G3 by Sex with Absences as Covariate

Student sex numeric factor generated from sex

Dependent Variable	Student sex numeric factor generated from sex	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
G1	1	11.630 ^a	.138	11.359	11.901
	2	11.067 ^a	.166	10.741	11.392
G2	1	11.816 ^a	.147	11.527	12.105
	2	11.216 ^a	.177	10.869	11.563
G3	1	12.248 ^a	.163	11.927	12.569
	2	11.413 ^a	.196	11.029	11.798

a. Covariates appearing in the model are evaluated at the following values: absences = 3.6595.