```
PRESERVE.
SET DECIMAL DOT.

GET DATA  /TYPE=TXT
  /FILE="F:\HMI\Exoskeleton\OpenSim\Walking_Mass_Inertia_Effect\Data\Statistic
s\Ideal\Actuators_MaxPositivePower_Dataset.csv"
  /ENCODING='UTF8'
  /DELIMITERS=","
  /QUALIFIER='"'
  /ARRANGEMENT=DELIMITED
  /FIRSTCASE=2
  /DATATYPEMIN PERCENTAGE=95.0
  /VARIABLES=
  subjects AUTO
  assistiveactuator AUTO
  maxpower01 AUTO
  maxpower02 AUTO
  maxpower03 AUTO
  V1 AUTO
  /MAP.
RESTORE.
CACHE.
EXECUTE.

Data written to the working file.
6 variables and 56 cases written.
Variable: subjects           Type: String  Format : A9
Variable: assistiveactuator   Type: String  Format : A34
Variable: maxpower01         Type: Number  Format : F18.16
Variable: maxpower02         Type: Number  Format : F18.16
Variable: maxpower03         Type: Number  Format : F18.16
Variable: V1                 Type: Number  Format : F1         One or more val
ues were set to system-missing.

Substitute the following to build syntax for these data.
  /VARIABLES=
   subjects A9
   assistiveactuator A34
   maxpower01 F18.16
   maxpower02 F18.16
   maxpower03 F18.16
   V1 F1
```

```
DATASET NAME DataSet1 WINDOW=FRONT.
GLM maxpower01 maxpower02 maxpower03 BY assistiveactuator
  /WSFACTOR=factor1 3 Polynomial
  /METHOD=SSTYPE(3)
  /POSTHOC=assistiveactuator(TUKEY)
  /PRINT=DESCRIPTIVE ETASQ HOMOGENEITY
  /CRITERIA=ALPHA(.05)
  /WSDESIGN=factor1
  /DESIGN=assistiveactuator.
```

General Linear Model

```
[DataSet1]
```

Within-Subjects Factors

Measure: MEASURE_1

factor1	Dependent Variable
1	maxpower01
2	maxpower02
3	maxpower03

Between-Subjects Factors

		N
assistiveactuator	loaded biarticular hip actuator	7
	loaded biarticular knee actuator	7
	loaded monoarticular hip actuator	7
	loaded monoarticular knee actuator	7
	noload biarticular hip actuator	7
	noload biarticular knee actuator	7
	noload monoarticular hip actuator	7
	noload monoarticular knee actuator	7

Descriptive Statistics

	assistiveactuator	Mean	Std. Deviation	N
maxpower01	loaded biarticular hip actuator	4.988900927	.8055876296	7
	loaded biarticular knee actuator	5.946326060	2.060184301	7
	loaded monoarticular hip actuator	4.204783390	.7917218009	7
	loaded monoarticular knee actuator	4.516800925	1.291647351	7
	noload biarticular hip actuator	4.645418959	.6359789581	7
	noload biarticular knee actuator	5.200910359	.6722069766	7
	noload monoarticular hip actuator	2.980607647	.5107631913	7
	noload monoarticular knee actuator	4.265893780	.6380713466	7
	Total	4.593705256	1.270963070	56
maxpower02	loaded biarticular hip actuator	4.710620720	.9454121102	7
	loaded biarticular knee actuator	5.411117365	1.354423389	7
	loaded monoarticular hip actuator	3.914539963	.7815332404	7
	loaded monoarticular knee actuator	4.009591073	.8935529995	7
	noload biarticular hip actuator	4.662213281	.8320842212	7
	noload biarticular knee actuator	4.925768713	1.082789450	7
	noload monoarticular hip actuator	2.828245394	.4710383658	7
	noload monoarticular knee actuator	4.104415976	.8835170252	7
	Total	4.320814061	1.148491819	56
maxpower03	loaded biarticular hip actuator	4.998997822	.6476972524	7
	loaded biarticular knee actuator	5.519823649	1.468035291	7
	loaded monoarticular hip actuator	4.136142387	.6118196903	7
	loaded monoarticular knee actuator	4.193703738	.8385113516	7

Descriptive Statistics

	assistiveactuator	Mean	Std. Deviation	N
	noload biarticular hip actuator	4.656669267	.9360563981	7
	noload biarticular knee actuator	5.192070587	.7947163442	7
	noload monoarticular hip actuator	2.964609350	.4436753945	7
	noload monoarticular knee actuator	4.370912144	.8275292631	7
	Total	4.504116118	1.103695542	56

Box's Test of Equality of Covariance Matrices[a]

Box's M	97.709
F	1.828
df1	42
df2	3810.531
Sig.	.001

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

a. Design: Intercept + assistiveactuator
Within Subjects Design: factor1

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df
factor1	Pillai's Trace	.179	5.141[b]	2.000	47.000
	Wilks' Lambda	.821	5.141[b]	2.000	47.000
	Hotelling's Trace	.219	5.141[b]	2.000	47.000
	Roy's Largest Root	.219	5.141[b]	2.000	47.000
factor1 * assistiveactuator	Pillai's Trace	.102	.370	14.000	96.000
	Wilks' Lambda	.900	.363[b]	14.000	94.000
	Hotelling's Trace	.108	.356	14.000	92.000
	Roy's Largest Root	.066	.450[c]	7.000	48.000

Multivariate Tests[a]

Effect		Sig.	Partial Eta Squared
factor1	Pillai's Trace	.010	.179
	Wilks' Lambda	.010	.179
	Hotelling's Trace	.010	.179
	Roy's Largest Root	.010	.179
factor1 * assistiveactuator	Pillai's Trace	.980	.051
	Wilks' Lambda	.982	.051
	Hotelling's Trace	.983	.051
	Roy's Largest Root	.865	.062

a. Design: Intercept + assistiveactuator
Within Subjects Design: factor1

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser
factor1	.708	16.244	2	.000	.774

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Epsilon[b] Huynh-Feldt	Lower-bound
factor1	.911	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + assistiveactuator
Within Subjects Design: factor1

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F
factor1	Sphericity Assumed	2.167	2	1.084	4.633
	Greenhouse-Geisser	2.167	1.548	1.400	4.633
	Huynh-Feldt	2.167	1.823	1.189	4.633
	Lower-bound	2.167	1.000	2.167	4.633
factor1 * assistiveactuator	Sphericity Assumed	1.267	14	.091	.387
	Greenhouse-Geisser	1.267	10.834	.117	.387
	Huynh-Feldt	1.267	12.760	.099	.387
	Lower-bound	1.267	7.000	.181	.387
Error(factor1)	Sphericity Assumed	22.454	96	.234	
	Greenhouse-Geisser	22.454	74.291	.302	
	Huynh-Feldt	22.454	87.494	.257	
	Lower-bound	22.454	48.000	.468	

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Sig.	Partial Eta Squared
factor1	Sphericity Assumed	.012	.088
	Greenhouse-Geisser	.020	.088
	Huynh-Feldt	.015	.088
	Lower-bound	.036	.088
factor1 * assistiveactuator	Sphericity Assumed	.976	.053
	Greenhouse-Geisser	.956	.053
	Huynh-Feldt	.969	.053
	Lower-bound	.905	.053
Error(factor1)	Sphericity Assumed		
	Greenhouse-Geisser		
	Huynh-Feldt		
	Lower-bound		

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	factor1	Type III Sum of Squares	df	Mean Square	F
factor1	Linear	.225	1	.225	.836
	Quadratic	1.942	1	1.942	9.769
factor1 * assistiveactuator	Linear	.834	7	.119	.443
	Quadratic	.433	7	.062	.311
Error(factor1)	Linear	12.910	48	.269	
	Quadratic	9.544	48	.199	

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	factor1	Sig.	Partial Eta Squared
factor1	Linear	.365	.017
	Quadratic	.003	.169
factor1 * assistiveactuator	Linear	.870	.061
	Quadratic	.946	.043
Error(factor1)	Linear		
	Quadratic		

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
maxpower01	Based on Mean	4.545	3	52	.007
	Based on Median	3.990	3	52	.012
	Based on Median and with adjusted df	3.990	3	36.183	.015
	Based on trimmed mean	4.535	3	52	.007
maxpower02	Based on Mean	.405	3	52	.750
	Based on Median	.344	3	52	.793
	Based on Median and with adjusted df	.344	3	42.456	.793
	Based on trimmed mean	.408	3	52	.748
maxpower03	Based on Mean	.485	3	52	.694
	Based on Median	.365	3	52	.778
	Based on Median and with adjusted df	.365	3	38.372	.779
	Based on trimmed mean	.475	3	52	.701

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

a. Design: Intercept + assistiveactuator
Within Subjects Design: factor1

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	3361.116	1	3361.116	1492.436	.000	.969
assistiveactuator	96.567	7	13.795	6.126	.000	.472
Error	108.101	48	2.252			

Post Hoc Tests

assistiveactuator

Multiple Comparisons

Measure: MEASURE_1

Tukey HSD

(I) assistiveactuator	(J) assistiveactuator	Mean Difference (I-J)	Std. Error	Sig.
loaded biarticular hip actuator	loaded biarticular knee actuator	-.726249202	.4631261357	.766
	loaded monoarticular hip actuator	.8143512426	.4631261357	.650
	loaded monoarticular knee actuator	.6594745775	.4631261357	.842
	noload biarticular hip actuator	.2447393205	.4631261357	.999
	noload biarticular knee actuator	-.206743397	.4631261357	1.000
	noload monoarticular hip actuator	1.97501903*	.4631261357	.002
	noload monoarticular knee actuator	.6524325227	.4631261357	.849
loaded biarticular knee actuator	loaded biarticular hip actuator	.7262492016	.4631261357	.766
	loaded monoarticular hip actuator	1.54060044*	.4631261357	.033
	loaded monoarticular knee actuator	1.385723779	.4631261357	.077
	noload biarticular hip actuator	.9709885221	.4631261357	.432
	noload biarticular knee actuator	.5195058046	.4631261357	.949
	noload monoarticular hip actuator	2.70126823*	.4631261357	.000
	noload monoarticular knee actuator	1.378681724	.4631261357	.080
loaded monoarticular hip actuator	loaded biarticular hip actuator	-.814351243	.4631261357	.650
	loaded biarticular knee actuator	-1.54060044*	.4631261357	.033
	loaded monoarticular knee actuator	-.154876665	.4631261357	1.000
	noload biarticular hip actuator	-.569611922	.4631261357	.919
	noload biarticular knee actuator	-1.02109464	.4631261357	.367

Multiple Comparisons

Measure: MEASURE_1

Tukey HSD

(I) assistiveactuator	(J) assistiveactuator	95% Confidence Interval	
		Lower Bound	Upper Bound
loaded biarticular hip actuator	loaded biarticular knee actuator	-2.19356475	.7410663430
	loaded monoarticular hip actuator	-.652964302	2.281666787
	loaded monoarticular knee actuator	-.807840967	2.126790122
	noload biarticular hip actuator	-1.22257622	1.712054865
	noload biarticular knee actuator	-1.67405894	1.260572148
	noload monoarticular hip actuator	.5077034814	3.442334570
	noload monoarticular knee actuator	-.814883022	2.119748067
loaded biarticular knee actuator	loaded biarticular hip actuator	-.741066343	2.193564746
	loaded monoarticular hip actuator	.0732848996	3.007915989
	loaded monoarticular knee actuator	-.081591766	2.853039324
	noload biarticular hip actuator	-.496327022	2.438304067
	noload biarticular knee actuator	-.947809740	1.986821349
	noload monoarticular hip actuator	1.233952683	4.168583772
	noload monoarticular knee actuator	-.088633820	2.845997269
loaded monoarticular hip actuator	loaded biarticular hip actuator	-2.28166679	.6529643019
	loaded biarticular knee actuator	-3.00791599	-.073284900
	loaded monoarticular knee actuator	-1.62219221	1.312438879
	noload biarticular hip actuator	-2.03692747	.8977036225
	noload biarticular knee actuator	-2.48841018	.4462209050

Multiple Comparisons

Measure: MEASURE_1

Tukey HSD

(I) assistiveactuator	(J) assistiveactuator	Mean Difference (I-J)	Std. Error	Sig.
	noload monoarticular hip actuator	1.160667783	.4631261357	.218
	noload monoarticular knee actuator	-.161918720	.4631261357	1.000
loaded monoarticular knee actuator	loaded biarticular hip actuator	-.659474577	.4631261357	.842
	loaded biarticular knee actuator	-1.38572378	.4631261357	.077
	loaded monoarticular hip actuator	.1548766652	.4631261357	1.000
	noload biarticular hip actuator	-.414735257	.4631261357	.985
	noload biarticular knee actuator	-.866217974	.4631261357	.577
	noload monoarticular hip actuator	1.315544448	.4631261357	.109
	noload monoarticular knee actuator	-.007042055	.4631261357	1.000
noload biarticular hip actuator	loaded biarticular hip actuator	-.244739321	.4631261357	.999
	loaded biarticular knee actuator	-.970988522	.4631261357	.432
	loaded monoarticular hip actuator	.5696119221	.4631261357	.919
	loaded monoarticular knee actuator	.4147352569	.4631261357	.985
	noload biarticular knee actuator	-.451482717	.4631261357	.976
	noload monoarticular hip actuator	1.73027971*	.4631261357	.011
	noload monoarticular knee actuator	.4076932022	.4631261357	.987
noload biarticular knee actuator	loaded biarticular hip actuator	.2067433969	.4631261357	1.000
	loaded biarticular knee actuator	-.519505805	.4631261357	.949
	loaded monoarticular hip actuator	1.021094640	.4631261357	.367

Multiple Comparisons

Measure: MEASURE_1

Tukey HSD

(I) assistiveactuator	(J) assistiveactuator	95% Confidence Interval	
		Lower Bound	Upper Bound
	noload monoarticular hip actuator	-.306647761	2.627983328
	noload monoarticular knee actuator	-1.62923426	1.305396825
loaded monoarticular knee actuator	loaded biarticular hip actuator	-2.12679012	.8078409671
	loaded biarticular knee actuator	-2.85303932	.0815917655
	loaded monoarticular hip actuator	-1.31243888	1.622192210
	noload biarticular hip actuator	-1.88205080	1.052580288
	noload biarticular knee actuator	-2.33353352	.6010975701
	noload monoarticular hip actuator	-.151771096	2.782859993
	noload monoarticular knee actuator	-1.47435760	1.460273490
noload biarticular hip actuator	loaded biarticular hip actuator	-1.71205487	1.222576224
	loaded biarticular knee actuator	-2.43830407	.4963270224
	loaded monoarticular hip actuator	-.897703622	2.036927467
	loaded monoarticular knee actuator	-1.05258029	1.882050801
	noload biarticular knee actuator	-1.91879826	1.015832827
	noload monoarticular hip actuator	.2629641608	3.197595250
	noload monoarticular knee actuator	-1.05962234	1.875008747
noload biarticular knee actuator	loaded biarticular hip actuator	-1.26057215	1.674058941
	loaded biarticular knee actuator	-1.98682135	.9478097399
	loaded monoarticular hip actuator	-.446220905	2.488410184

Multiple Comparisons

Measure: MEASURE_1

Tukey HSD

(I) assistiveactuator	(J) assistiveactuator	Mean Difference (I-J)	Std. Error	Sig.
	loaded monoarticular knee actuator	.8662179744	.4631261357	.577
	noload biarticular hip actuator	.4514827175	.4631261357	.976
	noload monoarticular hip actuator	2.18176242*	.4631261357	.001
	noload monoarticular knee actuator	.8591759197	.4631261357	.587
noload monoarticular hip actuator	loaded biarticular hip actuator	-1.97501903*	.4631261357	.002
	loaded biarticular knee actuator	-2.70126823*	.4631261357	.000
	loaded monoarticular hip actuator	-1.16066778	.4631261357	.218
	loaded monoarticular knee actuator	-1.31554445	.4631261357	.109
	noload biarticular hip actuator	-1.73027971*	.4631261357	.011
	noload biarticular knee actuator	-2.18176242*	.4631261357	.001
	noload monoarticular knee actuator	-1.32258650	.4631261357	.105
noload monoarticular knee actuator	loaded biarticular hip actuator	-.652432523	.4631261357	.849
	loaded biarticular knee actuator	-1.37868172	.4631261357	.080
	loaded monoarticular hip actuator	.1619187199	.4631261357	1.000
	loaded monoarticular knee actuator	.0070420547	.4631261357	1.000
	noload biarticular hip actuator	-.407693202	.4631261357	.987
	noload biarticular knee actuator	-.859175920	.4631261357	.587
	noload monoarticular hip actuator	1.322586503	.4631261357	.105

Multiple Comparisons

Measure: MEASURE_1

Tukey HSD

(I) assistiveactuator	(J) assistiveactuator	95% Confidence Interval	
		Lower Bound	Upper Bound
	loaded monoarticular knee actuator	-.601097570	2.333533519
	noload biarticular hip actuator	-1.01583283	1.918798262
	noload monoarticular hip actuator	.7144468783	3.649077967
	noload monoarticular knee actuator	-.608139625	2.326491464
noload monoarticular hip actuator	loaded biarticular hip actuator	-3.44233457	-.507703481
	loaded biarticular knee actuator	-4.16858377	-1.23395268
	loaded monoarticular hip actuator	-2.62798333	.3066477613
	loaded monoarticular knee actuator	-2.78285999	.1517710961
	noload biarticular hip actuator	-3.19759525	-.262964161
	noload biarticular knee actuator	-3.64907797	-.714446878
	noload monoarticular knee actuator	-2.78990205	.1447290414
noload monoarticular knee actuator	loaded biarticular hip actuator	-2.11974807	.8148830218
	loaded biarticular knee actuator	-2.84599727	.0886338203
	loaded monoarticular hip actuator	-1.30539682	1.629234264
	loaded monoarticular knee actuator	-1.46027349	1.474357599
	noload biarticular hip actuator	-1.87500875	1.059622342
	noload biarticular knee actuator	-2.32649146	.6081396249
	noload monoarticular hip actuator	-.144729041	2.789902048

Based on observed means.
The error term is Mean Square(Error) = .751.

*. The mean difference is significant at the .05 level.

Homogeneous Subsets

MEASURE_1

Tukey HSD[a,b]

assistiveactuator	N	Subset 1	2	3
noload monoarticular hip actuator	7	2.924487464		
loaded monoarticular hip actuator	7	4.085155247	4.085155247	
loaded monoarticular knee actuator	7	4.240031912	4.240031912	4.240031912
noload monoarticular knee actuator	7	4.247073967	4.247073967	4.247073967
noload biarticular hip actuator	7		4.654767169	4.654767169
loaded biarticular hip actuator	7		4.899506490	4.899506490
noload biarticular knee actuator	7		5.106249886	5.106249886
loaded biarticular knee actuator	7			5.625755691
Sig.		.105	.367	.077

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = .751.

a. Uses Harmonic Mean Sample Size = 7.000.

b. Alpha = .05.