

The SAS System

The Mixed Procedure

Model Information	
Data Set	WORK.STRENGTH_DATA
Dependent Variable	strength
Covariance Structure	Variance Components
Estimation Method	Type 3
Residual Variance Method	Factor
Fixed Effects SE Method	Model-Based
Degrees of Freedom Method	Containment

Class Level Information		
Class	Levels	Values
machine	4	1 2 3 4
operator	3	1 2 3

Dimensions	
Covariance Parameters	4
Columns in X	1
Columns in Z	19
Subjects	1
Max Obs Per Subject	24

Number of Observations	
Number of Observations Read	24
Number of Observations Used	24
Number of Observations Not Used	0

Type 3 Analysis of Variance								
Source	DF	Sum of Squares	Mean Square	Expected Mean Square	Error Term	Error DF	F Value	Pr > F
machine	3	12.458333	4.152778	Var(Residual) + 2 Var (machine*operator) + 6 Var (machine)	MS (machine*operator)	6	0.56	0.6619
operator	2	160.333333	80.166667	Var(Residual) + 2 Var (machine*operator) + 8 Var (operator)	MS (machine*operator)	6	10.77	0.0103
machine*operator	6	44.666667	7.444444	Var(Residual) + 2 Var (machine*operator)	MS(Residual)	12	1.96	0.1507
Residual	12	45.500000	3.791667	Var(Residual)

Covariance Parameter Estimates	
Cov Parm	Estimate
machine	-0.5486
operator	9.0903

Covariance Parameter Estimates	
Cov Parm	Estimate
machine*operator	1.8264
Residual	3.7917

Fit Statistics	
-2 Res Log Likelihood	109.5
AIC (smaller is better)	117.5
AICC (smaller is better)	119.7
BIC (smaller is better)	115.1

The SAS System

The Mixed Procedure

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

Class Level Information		
Class	Levels	Values
machine	4	1 2 3 4
operator	3	1 2 3

Dimensions	
Covariance Parameters	4
Columns in X	1
Columns in Z	19
Subjects	1
Max Obs Per Subject	24

Number of Observations	
Number of Observations Read	24
Number of Observations Used	24
Number of Observations Not Used	0

Iteration History			
Iteration	Evaluations	-2 Res Log Like	Criterion
0	1	124.48875799	
1	3	109.85258730	0.00025935
2	1	109.84333612	0.00000208
3	1	109.84326553	0.00000000

Convergence criteria met.

Covariance Parameter Estimates	
Cov Parm	Estimate
machine	0
operator	9.2275
machine*operator	1.2777

Covariance Parameter Estimates	
Cov Parm	Estimate
Residual	3.7917

Fit Statistics	
-2 Res Log Likelihood	109.8
AIC (smaller is better)	115.8
AICC (smaller is better)	117.1
BIC (smaller is better)	114.0

Solution for Fixed Effects								
Effect	Estimate	Standard Error	DF	t Value	Pr > t	Alpha	Lower	Upper
Intercept	207.29	1.8277	2	113.42	<.0001	0.05	199.43	215.16

Estimates								
Label	Estimate	Standard Error	DF	t Value	Pr > t	Alpha	Lower	Upper
Avg. solder strength	207.29	1.8277	2	113.42	<.0001	0.05	199.43	215.16