

SAS proc mix

```

data t;
  input vagrp $1. pat mol mo2 mo3 ;
  y=mol;time=1;output;
  y=mo2;time=2;output;
  y=mo3;time=3;output;
drop mol-mo3;
datalines;
g 1 6 3 0
g 3 7 3 1
g 4 4 1 2
g 7 8 4 3
c 2 6 5 5
c 5 9 4 6
c 6 5 3 4
c 8 6 2 3
;

options symbolgen mprint mlogic;

proc sort data=t;
by vagrp time pat;

%macro mdl(cr);

  /* unstructured variance matrix */
proc mixed data=t order=data method=ml;
  class vagrp pat time ;
  model y = vagrp time vagrp*time ;
  repeated / type=&cr sub=pat r rcorr;
  contrast 'A vs B' vagrp 1 -1 ;
  contrast 'A vs B in time1' vagrp 1 -1
  vagrp*TIME 1 0 0 -1 0 0;
  contrast 'A vs B in time2' vagrp 1 -1
  vagrp*TIME 0 1 0 0 -1 0;
  lsmeans time VAGRP TIME*VAGRP/PDIFF;
make 'contrast' OUT= c2 ;
make 'tests' OUT= u1 ;
make 'fitting' OUT= i1 ;
make 'DIFFS' OUT= M1 ;

  run;
proc print data=M1;
  run;
%MEND;
%MDL(CS)
/*%MDL(UN)
%MDL(AR(1)) */

```

Results

The Mixed Procedure				The Mixed Procedure				
Estimated R Matrix for pat 2				Model Information				
Row	Col1	Col2	Col3	Data Set	WORK.T			
1	1.5625	0.8021	0.8021	Dependent Variable	y			
2	0.8021	1.5625	0.8021	Covariance Structure	Compound Symmetry			
3	0.8021	0.8021	1.5625	Subject Effect	pat			
Estimated R Correlation Matrix for pat 2				Estimation Method	REML			
Row	Col1	Col2	Col3	Residual Variance Method	Profile			
1	1.0000	0.5133	0.5133	Fixed Effects SE Method	Model-Based			
2	0.5133	1.0000	0.5133	Degrees of Freedom Method	Between-Within			
3	0.5133	0.5133	1.0000	Class Level Information				
Covariance Parameter Estimates				Class	Levels	Values		
Cov Parm	Subject	Estimate		vagrp	2	c g	2 5 6 8 1 3 4 7	
CS	pat	0.8021		time	3	1 2 3		
Residual		0.7604		Dimensions				
Fit Statistics				Covariance Parameters	2			
-2 Log Likelihood			72.9	Columns in X	12			
AIC (smaller is better)			88.9	Columns in Z	0			
AICC (smaller is better)			98.5	Subjects	8			
BIC (smaller is better)			89.6	Max Obs Per Subject	3			
Null Model Likelihood Ratio Test				Number of Observations				
DF	Chi-Square	Pr > ChiSq		Number of Observations Read	24			
1	5.87	0.0154		Number of Observations Used	24			
Type 3 Tests of Fixed Effects				Number of Observations Not Used	0			
Effect	Num DF	Den DF	F Value	Pr > F	Iteration History			
vagrp	1	6	3.37	0.1161	Iteration	Evaluations	-2 Log Like	Criterion
time	2	12	38.52	<.0001	0	1	78.81994006	0.00000000
vagrp*time	2	12	5.64	0.0187	1	1	72.94826567	
				Convergence criteria met.				

The Mixed Procedure				
Contrasts				
Label	Num DF	Den DF	F Value	Pr > F
A vs B	1	6	3.37	0.1161
A vs B in time1	1	12	0.08	0.7821
A vs B in time2	1	12	0.72	0.4128

Least Squares Means							
Effect	vagrp	time	Estimate	Standard Error	DF	t Value	Pr > t
time		1	6.3750	0.4419	12	14.42	<.0001
time		2	3.1250	0.4419	12	7.07	<.0001
time		3	3.0000	0.4419	12	6.79	<.0001
vagrp	c		4.8333	0.5137	6	9.41	<.0001
vagrp	g		3.5000	0.5137	6	6.81	0.0005
vagrp*time	c	1	6.5000	0.6250	12	10.40	<.0001
vagrp*time	c	2	3.5000	0.6250	12	5.60	0.0001
vagrp*time	c	3	4.5000	0.6250	12	7.20	<.0001
vagrp*time	g	1	6.2500	0.6250	12	10.00	<.0001
vagrp*time	g	2	2.7500	0.6250	12	4.40	0.0009
vagrp*time	g	3	1.5000	0.6250	12	2.40	0.0335

Differences of Least Squares Means									
Effect	vagrp	time	_vagrp	_time	Estimate	Standard Error	DF	t Value	Pr > t
time		1		2	3.2500	0.4360	12	7.45	<.0001
time		1		3	3.3750	0.4360	12	7.74	<.0001
time		2		3	0.1250	0.4360	12	0.29	0.7792
vagrp	c		g		1.3333	0.7265	6	1.84	0.1161
vagrp*time	c	1	c	2	3.0000	0.6166	12	4.87	0.0004
vagrp*time	c	1	c	3	2.0000	0.6166	12	3.24	0.0070
vagrp*time	c	1	g	1	0.2500	0.8839	12	0.28	0.7821
vagrp*time	c	1	g	2	3.7500	0.8839	12	4.24	0.0011
vagrp*time	c	1	g	3	5.0000	0.8839	12	5.66	0.0001
vagrp*time	c	2	c	3	-1.0000	0.6166	12	-1.62	0.1308
vagrp*time	c	2	g	1	-2.7500	0.8839	12	-3.11	0.0090
vagrp*time	c	2	g	2	0.7500	0.8839	12	0.85	0.4128
vagrp*time	c	2	g	3	2.0000	0.8839	12	2.26	0.0430
vagrp*time	c	3	g	1	-1.7500	0.8839	12	-1.90	0.0711
vagrp*time	c	3	g	2	1.7500	0.8839	12	1.98	0.0711
vagrp*time	c	3	g	3	3.0000	0.8839	12	3.39	0.0053
vagrp*time	g	1	g	2	3.5000	0.6166	12	5.68	0.0001