**Program 18.6:** SAS code for Two-Group Comparision of Repeated Continuous Measurement

%macro SS\_RepeatedContinuousMeasurement(

missingPattern = , /\* 1: independent missing 2: monotone missing \*/

corrStructure = , /\* 1: compound symetric , 2: AR(1) \*/

rho = , /\* associated correlation parameter \*/

m = , /\* number of measurement time points \*/

sigma\_sq = , /\* variance \*/

inR = , /\* group allocation proportion(r1, r2) \*/

inDelta = , /\* proportion of observed measurements \*/

alpha = , /\* alpha \*/

power = , /\* power \*/

sides = , /\* 1: one-sided test 2: two-sided test \*/

print = 0 /\* 0:default 1: detail \*/

);

proc iml;

%let K = 2; r = &inR; delta = &inDelta; t = J(&m,1,0);

do j=1 to &m; t[j] = j-1; end;

%if &inDelta eq %then %do; delta=J(&m,1,0);do j=1 to &m; delta[j]=1-(j-1)/20; end; %end;

d = sqrt(&sigma\_sq)/(t[&m]-t[1]);

start g(p); gp = log(p/(1-p)); return (gp); finish g;

start prob(a,b,t); p = 1/(1+exp(-a-b\*t)); return (p); finish prob;

start rho(i,j,r,c);

if c=1 then do; /\* CS \*/ if i=j then rho\_ij =1;else rho\_ij = r; end;

else do; /\* AR(1) \*/ dist = abs(i-j); rho\_ij = r\*\*dist; end;

return (rho\_ij);

finish rho;

tau\_num =0; tau\_denum = 0;

do j=1 to &m; tau\_num = tau\_num+delta[j]\*t[j]; tau\_denum = tau\_denum+delta[j]; end;

tau= tau\_num/tau\_denum; s\_sq=0;

do j=1 to &m; s\_sq = s\_sq+delta[j]\*((t[j]-tau)\*\*2); end;

c=0;

do i=1 to &m;

do j=1 to &m;

if i ^= j then do;

if &missingPattern = 1 then do; delta\_ij = delta[i]\*delta[j]; end;

else do; if j > i then max\_ij=j; else max\_ij=i; delta\_ij=delta[max\_ij]; end;

c = c+delta\_ij\*rho(i,j,&rho,&corrStructure)\*(t[i]-tau)\*(t[j]-tau);

end;

end;

end;

v = &sigma\_sq\*(s\_sq+c)/(s\_sq\*\*2);

z\_p1=1-&alpha/&sides; z\_alpha = probit(z\_p1); z\_p2=&power; z\_beta = probit(z\_p2);

n = int((v\*(z\_alpha+z\_beta)\*\*2)/(d\*\*2\*r[1]\*r[2]))+1;

print 'Sample Size Calculation for a Two-Group Comparision';

print ' of Repeated Continous Measurements';

alpha =&alpha; power=&power; rho=&rho; sides=&sides;

sigma\_sq=&sigma\_sq;

print alpha power rho sides;

if &missingPattern = 1 then do;print ' Missing Pattern: Independent '; end;

else if &missingPattern = 2 then do; print ' Missing Pattern: Monotone '; end;

if &corrStructure=1 then do; print ' Correlation Structure : Compound Symetric ';end;

else if &corrStructure = 2 then do; print ' Correlation Structure : AR(1) '; end;

%if &print = 1 %then %do; print delta; print tau s\_sq c v ; %end;

print d sigma\_sq;

print n;

quit;

run;

%mend SS\_RepeatedContinuousMeasurement;

/\*--Run the macro for Example 18.6 when Correlation Structure = Compound Symetric --\*/

%SS\_RepeatedContinuousMeasurement(

missingPattern = 2, /\* monotone missing \*/

corrStructure = 1, /\* compound symetric \*/

rho = 0.64, /\* associated correlation parameter \*/

m = 6, /\* number of measurement time points \*/

sigma\_sq = 815.84, /\* variance \*/

inR = %str({0.5, 0.5}), /\* group allocation proportion(r1, r2) \*/

inDelta = %str({1, 0.9, 0.78, 0.67, 0.54, 0.41}),

/\* proportion of observed measurements \*/

alpha = 0.05, /\* alpha \*/

power = 0.8, /\* power \*/

sides = 2, /\* two-sided test \*/

print = 1

);

/\*--- Run the macro for Example 18.6 when Correlation Structure = AR(1) ---------\*/

%SS\_RepeatedContinuousMeasurement(

missingPattern = 2, /\* monotone missing \*/

corrStructure = 2, /\* AR(1) \*/

rho = 0.8, /\* associated correlation parameter \*/

m = 6, /\* number of measurement time points \*/

sigma\_sq = 815.84, /\* variance \*/

inR = %str({0.5, 0.5}),/\* group allocation proportion(r1, r2) \*/

inDelta = %str({1, 0.9, 0.78, 0.67, 0.54, 0.41}),

/\* proportion of observed measurements \*/

alpha = 0.05, /\* alpha \*/

power = 0.8, /\* power \*/

sides = 2, /\* two-sided test \*/

print = 1

);