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|-----------------------------------------------------------------------------|
|Use individual macros:wide or long                                           |
|%Wide: %wide(in,out, vars,copy, id, time)                                    |
|%Long: %long(in, out, copy, time,index,LP, N, ID, common)                    |
|-----------------------------------------------------------------------------|
|Macro Parameters Definition: For %Wide macro                                 |
|Vars: Repeated variables to be reshaped into wide format                     |
|In: The dataset to be reshaped into                                          |
|Out: Name of the reshaped dataset you would like to get                      |
|Copy: Fixed variables or lists of variables that can be assumed fixed        |
|ID: ID variable/s                                                            |
|Time: Time variable identifying repeated measurement                         |
|-----------------------------------------------------------------------------|
|Macro Parameters Definition: For %Long macro. In and out as above.           |
|time: Time variable used as suffix of wide variables                         |
|Index: Starting position of time suffix of wide variables                    |
|N: length of suffix                                                          |
||Common: if suffix doesn't have 1st common initial, common=0                 |
|-----------------------------------------------------------------------------|
|The purpose of these macros is to help reshape multiple variables of long    |
|format dataset into wide format and wide format dataset into long format.    |
|An attempt has been made to keep the macros short.                           |
|To use the macro, you can just provide a path:                               |
|%include "path/Reshape_Multiple_Variables.sas"                               |
|*and then run each macro. Don't forget semicolon after your path above       |
|Before you use the macros,create one or both of the following macro          |
|variables using:  /*                                                         |
|%let vars=    ;/*List the repeated variables to be reshaped into wide*//*    |
|%Let copy=    ;/*List the fixed variables to be copied*/ */                  |
*-----------------------------------------------------------------------------*;

%let vars=          ;/*List the repeated variables to be reshaped into wide*/
%Let copy=          ; /*List the fixed variables to be copied*/
/*Import the dataset or use a libname statement to bring in data*/
/*Declare the MACRO called wide*/

%macro wide (in,out, vars,copy, id, time);
/*Sort by the &id and &time variable*/
Proc sort data=&in;
by &id &time;
run;

/***Transpose long to wide ***/
Proc transpose data=&in. out=&out.  ;
var &vars.;/*Repeated var list*/
By &id. &time.; /*The &ID and &time vars*/
copy &copy;/*Non-repeating vars list*/
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run;

Proc transpose data=&out. out=&out. (drop=_name_);/*Use the output dataset
from the step above*/
by &id; /*&ID var*/
var col1;/*This var is created in the proc transpose above*/
id _name_ &time.; /*_name_ (created above) and &time*/
copy &copy;/*Non-repeating vars list*/
run;
%mend;
%Let copy_long=          ; /*List the fixed variables to be copied*/
/*You can call it copy too*/
%macro long(in, out, copy_long, time,index, N, ID, common);
*LP is the equal to length of values of the time variable suffix N is LP+1*;
data fixed;
set &in;
by &id.;
keep &id &copy_long. ;
retain &id &copy_long.;
if first.&id. then do;
output fixed;
end;
run;

/*********Repeated Wide Data Only********/
/***Drop fixed variable****/
data &in._rep;
set &in;
drop &copy_long;
run;
/***Transpose wide to long ***/
proc transpose data=&in._rep out=long;
by &id. ;
var _numeric_ _char_;
run;
data long1;
set long;
%If &common=0   %then %do;
&Time.=substr(_name_ , length(_name_), &N.);
var= substr(_name_, 1, length(_name_)-length(&Time.));
%End;
%Else %do;
pos=index(_name_, "&index.");
&Time.=substr(_name_ ,pos,  length(_name_));
var= substr(_name_, 1, pos-1);
%End;
run;
proc sort data=long1 out=long2;
by &id. &Time.;
run;
proc transpose data=long2 out=wanted(drop=_name_);
by &id. &Time.;
var col1;
id var;
run;
/*********To Merge the wide data to fixed data******/
proc sort data=fixed;
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by &id.;
run;
Data &out._long;
merge wanted fixed;
by &id.;
If i~=. then delete;
drop i;
run;
Data &out._long;
set &out._long;
If &time.="" then delete;
run;
Proc print data=&out._long(obs=100);
run;
%mend long;
option spool;

/*Examples*/
data have;
input ID $  Name $   FirmID $   A1981   A1982  B1981   B1982 C1981  C1982;
cards;
1     x           123         2           3             4             5
6            7
2     y           124        22          33           44           55
66           77
3     z           555       222         333          444          555         667
777
;

/*List the non-repeating variables below*/
%let copy_long= Name  FirmID;
%long(in=have, out=want,copy_long=&copy_long., time=year,index=198, id=id,
common=0);

Proc print data=have;run;
proc print data=want_long;run;
Proc contents data=want_long;
run;
/*List the non-repeating variables below*/
%let copy= Name  FirmID;
/*List the repeating variables below*/
%let vars=A B C;
%wide(in=want_long,OUT=wide, vars= &vars ,  time=year, id=ID &copy);
*%wide(in=want_long,OUT=wide, vars= &vars ,copy=&copy, time=year, id=ID
&copy); /*This does not work as &copy is used twice*/
Proc print data=wide;
run;
Proc print data=have;
run;

/*A long data*/
data have2;
input id time  sex $ 5 eye $ 7  @9 age  sbp  dbp ;
cards;
1 0 M B 25 120 95
1 1     28 110 90
1 2     30 100 86
```

```
2 0 F G 30 115 105
2 1     35 130 100
2 2     36 135 105
3 0 F B 37 120 100
;
run;
%let copy=sex eye;
%let vars=age  sbp  dbp;

%wide(in=have2,OUT=wide, vars= &vars ,copy=&copy, time=time, id=ID );
proc print data=wide;
run;

/*The have2 wide variables have non-common suffixes*/
/*We add common=0*/;
%long(in=wide, out=wanted,copy_long=&copy., time=time , id=id, N=1,
common=0);


DATA data1;
INPUT id $ s1-s9;
CARDS;
01 1 0 1 0 0 0 0 0 0
02 0 0 0 1 0 0 0 0 0
03 1 1 1 1 1 1 1 1 1
…

;
run;

data data1;
set data1;
total=sum(s1+ s2 +s3+ s4+ s5+ s6+ s7+ s8+ s9);
run;

%let copy=total;
%long(in=data1, out=data, time=time,id=id,copy_long=&copy.,  N=1, common=0);
```