

Appendix III

```
%MACRO LOGISTICFORWARD(DATA, RESPONSE, CLASSVARS, EFFECTS, SLENTY=0.05);

%MACRO MATCHEFF(EFFECT1, EFFECT2);

  %LOCAL II VAR;

  %IF (%SYSFUNC(COUNTW(&EFFECT1)) NE %SYSFUNC(COUNTW(&EFFECT2))) %THEN 0;

  %ELSE %DO;

    %LET EFFECT1=%UPCASE(*&EFFECT1*);

    %LET II=1; %LET VAR=%SCAN(&EFFECT2, &II);

    %DO %WHILE (%INDEX(&EFFECT1, *&VAR*));

      %LET II=%EVAL(&II+1);

      %LET VAR=%SCAN(&EFFECT2, &II);

    %END;

    %IF ("&VAR"= "") %THEN 1; %ELSE 0;

  %END;

%MEND;

%MACRO REMOVEEFFECT(THISEFFECT, EFFECTS);

  %LOCAL II VAR;

  %LET THISEFFECT=%UPCASE(&THISEFFECT); %LET EFFECTS=%UPCASE(&EFFECTS);

  %LET II=1; %LET VAR=%SCAN(&EFFECTS, &II, %STR( ));

  %DO %WHILE ("&VAR" NE "");

    %IF (NOT %MATCHEFF(&THISEFFECT, &VAR)) %THEN &VAR;

    %LET II=%EVAL(&II+1);    %LET VAR=%SCAN(&EFFECTS, &II, %STR( ));

  %END;

%MEND;

%MACRO SELECTCLASSVARS(CLASSVARS, EFFECTS);

  %LOCAL II VAR;

  %LET II=1; %LET VAR=%SCAN(&EFFECTS, &II);
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```

%DO %WHILE ("&VAR" NE "");

  %IF %INDEX( %STR( %UPCASE(&CLASSVARS) ), %STR( %UPCASE(&VAR) )) %THEN &VAR;

  %LET II=%EVAL(&II+1);

  %LET VAR=%SCAN(&EFFECTS, &II);

%END;

%MEND;


%LOCAL II VAR THISCLASSVARS THISPVALUE THISEFFECT ENTERIT INCLUDEDDEFFS;

%LET ENTERIT=1; %LET INCLUDEDDEFFS=;

%DO %WHILE (&ENTERIT);

  PROC SQL; CREATE TABLE THISSTEP (EFFECT CHAR(50), PROBCHISQ NUM);

  %LET II=1; %LET VAR=%SCAN(&EFFECTS, &II, " ");

  %DO %WHILE ("&VAR" NE "");

    %LET THISCLASSVARS=%SELECTCLASSVARS(&CLASSVARS, &INCLUDEDDEFFS &VAR);

    PROC LOGISTIC DATA=&DATA DESCENDING;

      %IF ("&THISCLASSVARS" NE "") %THEN CLASS &THISCLASSVARS/PARAM=GLM; ;

      %IF ("&THISCLASSVARS" NE "") %THEN ODS OUTPUT MODELANOVA=_TYPE3;

      %ELSE ODS OUTPUT PARAMETERESTIMATES=_TYPE3; ;

      MODEL &RESPONSE=&VAR &INCLUDEDDEFFS;

    RUN;

    %IF ("&THISCLASSVARS" EQ "") %THEN %DO; /*ALL CONTINOUS VARIABLES*/

      DATA _TYPE3; SET _TYPE3 (RENAME=(VARIABLE=EFFECT)); IF(EFFECT NE "Intercept"); RUN;

    %END;

    DATA _TYPE3; SET _TYPE3; IF _N_=1;

    PROC SQL; INSERT INTO THISSTEP SELECT "&VAR" AS EFFECT, PROBCHISQ FROM _TYPE3;

  QUIT; RUN;

  %LET II=%EVAL(&II+1);

  %LET VAR=%SCAN(&EFFECTS, &II, " ");

%END;

PROC SQL; SELECT PROBCHISQ, (PROBCHISQ LE &SLENTY) , EFFECT INTO

  :THISPVALUE, :ENTERIT, :THISEFFECT FROM THISSTEP ORDER BY PROBCHISQ;

```

```
%PUT STEP - TRYING TO ADD %CMPRES(&THISEFFECT) WITH THE SMALLEST PVALUE OF  
&THISPVALUE, ADDING FLAG: &ENTERIT;
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```
%IF &ENTERIT %THEN %DO;
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```
%LET EFFECTS = %REMOVEEFFECT(&THISEFFECT, &EFFECTS);
```

```
%LET INCLUDEDDEFFS=&INCLUDEDDEFFS &THISEFFECT;
```

```
%IF ("%TRIM(&EFFECTS)" EQ "") %THEN %LET ENTERIT=0;
```

```
%END;
```

```
%END;
```

```
%LET THISCLASSVARS=%SELECTCLASSVARS(&CLASSVARS, &INCLUDEDDEFFS);
```

```
PROC LOGISTIC DATA=&DATA;
```

```
%IF ("&THISCLASSVARS" NE "") %THEN CLASS &THISCLASSVARS/PARAM=GLM; ;
```

```
MODEL &RESPONSE=&INCLUDEDDEFFS;
```

```
RUN;
```

```
%MEND LOGISTICFORWARD;
```

```
/*TEST CODE*****
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```
DATA SIMUDATA;
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```
ARRAY X{*} X1-X20;
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```
DO I=1 TO 500;
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```
DO J=1 TO 20;
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```
X{J}=NORMAL(-1)*2.5;
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```
END;
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```
IF UNIFORM(-1)<0.5 THEN C1=1; ELSE IF UNIFORM(-1)<0.5 THEN C1=2; ELSE C1=3;
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```
IF UNIFORM(-1)<0.5 THEN C2=1; ELSE IF UNIFORM(-1)<0.5 THEN C2=2; ELSE C2=3;
```

```
XB=1+3*X1+2*X2-1*X3+5*(C1=1)+X1*X2+5*(C1=2)*(C2=2);
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```
PROB=EXP(XB)/(1+EXP(XB));
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```
Y=(UNIFORM(-1)>PROB);
```

```
OUTPUT;
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END;

DROP I J XB PROB;

RUN;

%LOGISTICFORWARD(SIMUDATA, Y, C1 C2, X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14 X15
X16 X17 X18 X19 X20 C1 C2 X3*X1 X2*X1 C2*C1);

PROC LOGISTIC DATA=SIMUDATA;

CLASS C1 C2;

MODEL Y=X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18 X19 X20 C1 C2 X1*X2
X1*X3 C2*C1/SELECTION=FORWARD;

RUN;

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