



SAS Tips and Techniques*

BOSTON AREA SAS Users Groups

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SAS Tips and Techniques



MASSACHUSETTS

- SAS Function to Validate NPI
- How to eliminate data error notes from the SAS log

Using a SAS function to validate a National Provider ID (NPI) value



- **NPIs are 10 digits in length**
- **Luhn algorithm (Andrew Heuristic)**
- **Same approach used to Validate Credit Cards**
- **SAS 9.2 or higher**

Using a SAS function to validate a National Provider ID (NPI) value



MASSACHUSETTS

```
proc fcmp outlib=work.myfuncs.npi;
/*****
/* Validates that a National Provider ID (NPI) value is valid.  Checks only that it is valid in terms of its form, not that it */
/* corresponds to a real provider.  Uses the Luhn algorithm and a prefix of '80840'  More: */
/* http://en.wikipedia.org/wiki/Luhn\_algorithm      http://en.wikipedia.org/wiki/National\_Provider\_Identifier */
/* RETURNS: 1 if valid, 0 if not valid */
*****/
/* hat tip: Heuristic Andrew */
function isValidNpi(npi $);
  length AddIt $2 ChkStr $ 15 ChkSum 8;

  /* check length for NPI */
  if length(trim(npi)) ^= 10 then
    do;
      /* put 'Not 10 digits ' npi=; */
      return(0);
    end;
  /* check that all are digits */
  else if (prxmatch('/\D/',trim(npi)) > 0) then
    do;
      /* put 'invalid characters ' npi=; */
      return(0);
    end;
  else
    do;
```

Using a SAS function to validate a National Provider ID (NPI) value



MASSACHUSETTS

```
/* Luhn's algorithm (also called modulus 10 or mod 10) */
  ChkSum = 0;
  ChkStr=reverse(cats('80840',npi));
  do pos=1 to length(ChkStr);
    if mod(pos,2) then /* odd positions */
      do;
        AddIt=substr(ChkStr,pos,1);
      end;
    else /* even positions: digit*2 */
      do;
        AddIt=put(2*input(substr(ChkStr,pos,1),2.),2.);
      end;
    /* add digits */
    do i=1 to length(AddIt);
      ChkSum+input(substr(AddIt,i,1),2.);
    end;
  end;
/* Check if ID is valid or not (if ChkSum ends with Zero) */
if mod(ChkSum,10)=0 then
  do;
    /* put 'This is a valid ID: ' npi= ChkSum=;
```

Using a SAS function to validate a National Provider ID (NPI) value



MASSACHUSETTS

```
options cmplib=work.myfuncs;
data test;
  input npi $ 1-10;
  valid_npi = isValidNpi(npi);
  /* 4 valid NPIs followed by 5 invalid IDs */
  datalines;
1003802901
1003864232
1013955343
1134108814
0000000000
1234567890
15280060
152
1003802901;
proc print data=test;
```

Using a SAS function to validate a National Provider ID (NPI) value



MASSACHUSETTS

	npi	valid_npi
1	1003802901	1
2	1003864232	1
3	1013955343	1
4	1134108814	1
5	0000000000	0
6	1234567890	0
7	15280060	0
8	152	0
9	1003802901	0

How to eliminate data error notes from the SAS log



**How to sweep those unsightly data error notes under the rug.
(But sooner or later you'll need to deal with them...) :**

- **Write them to a separate file**

How to eliminate data error notes from the SAS log



MASSACHUSETTS

```
data class;  
    input name $ gender age;  
datalines;  
GEORGE M 20  
KAREN F 30  
ALISON F 40  
SCOTT M 25  
STEVE F 35;  
run;
```

```
Proc print data=class;  
run;
```



How to eliminate data error notes from the SAS log

NOTE: Invalid data for gender in line 4 8-8.

RULE: ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8----+----9----+----0

4 GEORGE M 20

name=GEORGE gender=. age=20 _ERROR_=1 _N_=1

NOTE: Invalid data for gender in line 5 7-7.

5 KAREN F 30

name=KAREN gender=. age=30 _ERROR_=1 _N_=2

NOTE: Invalid data for gender in line 6 8-8.

6 ALISON F 40

name=ALISON gender=. age=40 _ERROR_=1 _N_=3

NOTE: Invalid data for gender in line 7 7-7.

7 SCOTT M 25

name=SCOTT gender=. age=25 _ERROR_=1 _N_=4

NOTE: Invalid data for gender in line 8 7-7.

8 STEVE F 35

name=STEVE gender=. age=35 _ERROR_=1 _N_=5

NOTE: The data set WORK.CLASS has 5 observations and 3 variables.

NOTE: DATA statement used (Total process time):

 real time 0.09 seconds

 cpu time 0.00 seconds

How to eliminate data error notes from the SAS log



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-1 options errors=0; < masks error only >

-2

data class;

input name \$ gender age;

if _error_=1 then do;

file 'c:\MyInvalidDataNotes.txt';

put 'NOTE: Invalid data in line ' _N_;

put _infile_;

put _all_;

put;

end;

datalines;

GEORGE M 20

KAREN F 30

ALISON F 40

SCOTT M 25

STEVE F 35;

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Questions?

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