Paper 055-30

Pretty Dates All in a Row

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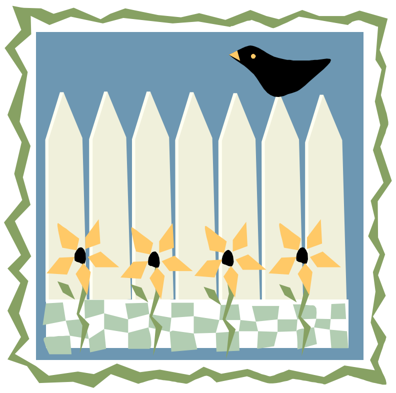


INTRODUCTION

Have you been faced with the task of producing reports on a regular basis that have a start and end date that change based on the date the report is run? Here are some tricks and tips for using the system date and the SAS functions INTNX with interval dot notation and INTCK to programmatically produce formats for your dates.

To simplify the running of reports which are scheduled at regular intervals, we can use SAS functions to create macro variables to represent the date ranges for the current execution of the report. This avoids the necessity of changing parameters every time we run. Using these macro variables, I can create formats dynamically which represent the time spans covered in the report.

WORKING WITH SAS DATES

A SAS date, time or datetime variable is a numeric variable which represents the number of days before or after January 1, 1960. The value of a time variable represents the number of seconds after midnight. Valid SAS Dates are from 1582 AD to 20,000 AD. SAS dates can be created using a number of SAS functions. DATE() and TODAY() both return the current system date as a SAS date. The date can also be derived from the SAS macro variable &SYSDATE.

CREATING MACRO VARIABLES

CALL SYMPUT

One common way of creating macro variables is to use CALL SYMPUT in a DATA *NULL* step to load the value into a macro variable. The syntax is:

```
   CALL SYMPUT(“VARNAME”, CHARACTER STRING VALUE) ;
```

I used CALL SYMPUT to count the number of weeks in the report.

MACRO FUNCTION %SYSFUNC

%SYSFUNC can execute SAS functions or user-written functions in open code. The syntax is

```
   %SYSFUNC(function(argument(s), <format>)
```

A common use of %SYSFUNC is to put today’s date into a title line:

```
   Title “%sysfunc(date(),worddate.) Absence Report”;
```

Executing this statement on April 11, 2005 produces this Title Statement:

```
   Title “April 11, 2005 Absence Report” ;
```

I used %sysfunc since it did everything that I wanted in one statement. (I admit that I had much help with these; see the Acknowledgements.)

THE PROBLEM

Because I want to customize my date ranges to reflect our Saturday to Friday work week, I needed to learn a little more about shifting intervals using the INTNX function. The solution to this problem evolved from a discussion on SAS-L: “How do I find the last Friday of the month for every month?” It was suggested using the INTNX function with dot notation and the number of the day of the week. For the details of this discussion, see the SAS-L archives or Viergever (2003).

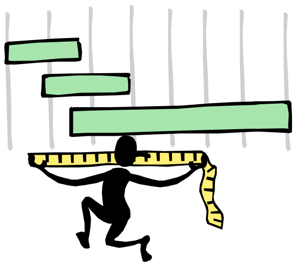
INTNX

The INTNX function advances a date, time, or datetime value by a given interval and returns a date, time, or datetime value. The syntax is:

INTNX(*'interval',start-from,increment*<,'*alignment*'>)

The first parameter is an interval key word enclosed in single quotes. This can be YEAR, QTR, MONTH, DAY, etc. The second parameter is a SAS date. The third parameter is a number, how many increments to move. The last parameter is an alignment key word, enclosed in single quotes, which can be BEGINNING (or BEG or B), MIDDLE (or MID or M), and END (or E). The default is B (first day of the period.)

INTERVALS



Both the INTNX and INTCK functions are interval functions. Both can use intervals in the form of
Name<multiple><.starting-point>.
Name is the name of the interval (week, year, etc.)
Multiple creates a multiple of the interval. Multiple can be any positive number. The default is 1. For example, YEAR2 indicates a two-year interval.

.starting-point
is the starting point of the interval. By default, the starting point is 1. A value greater than 1 shifts the start to a later point within the interval. The unit for shifting depends on the interval. For example, specifying a starting point for year shifts it from the default month of one, January. Specifyin a starting point for week shifts it from the default start day of one, Sunday. Therefore, YEAR.3 specifies a yearly period from the first of March through the end of February of the following year.

For more detail on intervals and shifting, see the referenced papers and documentation.

REPORTING DATE

For my reports, which I usually run on Monday, I want to find last Friday's date. The Week interval starts with Sunday, so Friday is week.6.

```
    ReportDate= intnx('week.6', today(),0)
```

The Start Date of the period will be the Saturday of the week before

```
    StartDate = intnx('week.7', ReportDate, 0)
```

Since I want to use %sysfunc to put the results into macro variables, my actual code looks like:

```
%* The Weekending date is always a Friday (week.6)     ;

%let ReportDate = %sysfunc(intnx(week.6, "&SYSDATE"D, 0), DATE9.);

%let StartDate = %sysfunc(intnx(week.7, "&ReportDate"D, 0), DATE9.) :;
```

THE COLUMN FORMAT

My first draft, I created the format as:

```
          Proc format ;
          Value weekcol
                    Low - &ref = "Prior to &ref"
                         Other = "Through Week Prior to &StartDate"
"&StartDate"D - "&ReportDate"D = "Week Ending &ReportDate"

;

where &ref is a specified starting point for the data.
```

Note the use of the value "other" in the format. The side effect of this usage is the reporting programs must delete data for dates outside of the range. The other really annoying side effect was that the "other" bucket was always printed last. I wanted the reference week to be printed last so I changed it to :

```
          Value weekcol
                    Low - &ref = "Prior to &ref"
    &ref <    -  < "&StartDate"D= "Through Week Prior to &StartDate"
"&StartDate"D - "&ReportDate"D = "Week Ending &ReportDate"
```

Note here the use of the "less than" character (<) to define the discrete time period. This solved the problem of the dates occurring in an odd order in the printout.

THE ROW FORMAT

For the cumulative history report, I want a week by week summary. In version 9 there is a function to count weeks, but we are still using 8.2. So I concocted a routine that uses the INTCK function to help me count weeks.

INTCK

The INTCK function counts intervals by using a fixed starting point for the interval as opposed to counting in multiples of the interval unit. Partial intervals are not counted. For example, WEEK intervals are determined by the number of Sundays that fall between the from and the to, not by how many seven-day periods fall in between the from and the to. The syntax is:

INTCK ('interval',from,to)

The interval can use the same name<multiple><.starting point> form described for INTNX.

Examples

—weekvar=intck('week2.2','01jan97'd, '31mar97'd); put weekvar;6

—wdvar=intck('weekday7w','01jan97'd, '01feb97'd); put wdvar;26

```
          To count the number of weeks to include in the report
/* Compute the number of weeks from startdate to reportdate */

data null ;

   startdate='18Jul03'd ;
   today=today();
   reportdate=intnx('week.6',today,0) ;
   week=intck('week.6',startdate,reportdate)-1 ;
   call symput('weekfrom',put(week,3.)) ;
   run;
```

The symput statement creates a macro variable &weekfrom, available in the next step.

This proc format generates a format definition with a line for each week from 0 to &weekfrom going backwards from today to the start date.

```
          /*  Generates a format for each week from today back to "&prtref" */
%macro doweek ;
proc format ;
value weekrow
Low -  &ref = "Prior to &prtref."
%do ii = 0 %to &weekfrom ;
   %* Note the minus sign, go backwards to &ref date  ;

    %let RDate = %sysfunc(intnx(week.6,"&SYSDATE"D,-&ii.),DATE9.) ;

   %let SDate  = %sysfunc(intnx(week.7,"&RDate"D,0),DATE9.) ;

          "&SDate"D - "&RDate"D  = "&SDate - &RDate"
%end ;
; run;
%mend doweek ;
```

Note the semi colon before the run statement closes the value statement of the PROC FORMAT.

APPLICATION USING TABULATE

In application, this routine is an include file called into a driver program that runs the reports. The reports have a master column that looks like this:

	Prior to 30JAN04		Through Week Prior to 26JUN2004		Week Ending 02JUL2004		Total	
	Time in Minutes		Time in Minutes		Time in Minutes		Time in Minutes	
		ColPctSum		ColPctSum		ColPctSum		ColPctSum
Reviewer								
Axxxx, Bennett	10782	3.2	19726	5.7	115	2.0	30623	4.5
Axxxxxx, Claire	22177	6.7	25618	7.4	105	1.8	47900	7.0
Axxxxxx, Carolyn	3379	1.0	-	-	-	-	3379	0.5
Bxxxxxx, Steve	5	0.0	-	-	-	-	5	0.0

And a row format that looks like this:

	Count of Updates Completed	Count of Reviewers Making Updates	Count of BASE IDs with updates
Time Period			
Prior to 30JAN04	12003	51	5103
31JAN2004 - 06FEB2004	146	5	143
07FEB2004 - 13FEB2004	14	1	14
14FEB2004 - 20FEB2004	48	9	45
21FEB2004 - 27FEB2004	79	8	76
28FEB2004 - 05MAR2004	154	14	150
06MAR2004 - 12MAR2004	142	13	139
13MAR2004 - 19MAR2004	92	11	85
20MAR2004 - 26MAR2004	63	8	61
27MAR2004 - 02APR2004	66	8	62
03APR2004 - 09APR2004	48	5	48
10APR2004 - 16APR2004	161	13	147
17APR2004 - 23APR2004	88	14	83
24APR2004 - 30APR2004	119	12	118
01MAY2004 - 07MAY2004	126	9	123
08MAY2004 - 14MAY2004	164	15	156
15MAY2004 - 21MAY2004	110	12	103
22MAY2004 - 28MAY2004	54	8	54
29MAY2004 - 04JUN2004	147	12	132
05JUN2004 - 11JUN2004	122	19	99
12JUN2004 - 18JUN2004	80	18	70
19JUN2004 - 25JUN2004	13	9	12
26JUN2004 - 02JUL2004	7	4	7
Total	14046	278	7030

CONCLUSION

SAS datetime functions make it easy to create macro variables to represent date ranges for periodic reports, and reduce introduction of errors in date handling.

REFERENCES

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Viergever, William W. (2003), "Tips from the Hood: Challenging Problems and Tips from SAS-L", Proceedings of the 28th SAS Users Group International

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Werner, Nina L. (2003) "Date Parameters for Interval Reporting," Proceedings of the 28th SAS Users Group International.

ACKNOWLEDGEMENTS

The author is indebted to my colleagues who participate in SAS-L for their contributions. I am especially indebted to Paul Dorfman for his help with this problem. He provided insight into the use of formats that I would not have realized on my own.

CONTACT INFORMATION

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TRADEMARKS