ABSTRACT

Dates in a corporate data arena can be a dangerous liaison. The strain of translating corporate date types to SAS® date types can be tricky to navigate, let alone bringing a third-party date type into the mix. Adding a third wheel to your SAS dates can create a comedy of errors. An experienced SAS programmer with knowledge of the SAS macros and a few clever programming tricks can more easily resolve your SAS Dates from a sticky situation to an orderly affair.

INTRODUCTION

One of the things that those of us that work with data have to deal with on a regular basis is data from an outside resource. In the health insurance world this can be from Centers for Medicare and Medicaid Services (CMS), an outside vendor, or complementary data from other insurance companies. In all of the data the one constant is inconsistency.

Much of this date field data comes into our warehouse in a myriad of ways. Sometimes this data is processed as numeric, sometimes as character, and never in the same format. Date fields are the first challenge data analysts must overcome before we can analyze the information and glean information contained within the data.

FIRST THE DREADED BLIND DATE

The format that has caused much consternation, within our organization, is formatted as a numeric field in the YYYYMMDD format. In the following example we have recreated this format with the following DATA step and output of the code in Figure 1. Setup data output.

```sas
data work.dates;
input date;
cards;
20130529
19980321
20090111
20011108
20130202
19970921
20110718
run;
```

![Figure 1. Setup data output](image)

Attempting to turn this directly into a date field with a PUT statement you get to enjoy the following error in your log.

```
put(date, anydtdte10.) as datel = (ERROR: Date value out of range)
```

Since the PUT statement does not like the data as is. Using the SUBSTRING function we can reorder the date to order the numbers in a more palatable format.

1. Isolate the 2 digits for the month \( \text{substr(put(date, 8.), 5, 2)} \)
2. Isolate the 2 digits for the day \(\text{substr(put(date, 8.), 7, 2)}\)

3. Isolate the 4 digits for the year \(\text{substr(put(date, 8.), 1, 4)}\)

4. Recombine the three elements with the CATS function.

\[
\text{cats(\text{substr(put(date, 8.), 5, 2)}, \text{substr(put(date, 8.), 7, 2)}, \text{substr(put(date, 8.), 1, 4)}) as date2}
\]

Now we end up with a character field that is in the order of MMDDYYYY as in Figure 2. Modified date output.

Next we can turn this date value into a numeric SAS date field by using the INPUT & ANYDTDTE functions as in Figure 3. Converted number SAS date.

\[
\text{input(\text{cats(\text{substr(put(date, 8.), 5, 2)}, \text{substr(put(date, 8.), 7, 2)}, \text{substr(put(date, 8.), 1, 4)}), anydtdte.) as date3}
\]

Finally just apply a date format to the field so that it becomes a date field that can be included in a required format for some reports outside of SAS as seen in Figure 4. Final converted date.

\[
\text{input(\text{cats(\text{substr(put(date, 8.), 5, 2)}, \text{substr(put(date, 8.), 7, 2)}, \text{substr(put(date, 8.), 1, 4)}), anydtdte.) format date9. as date4}
\]

No one likes to drag bad dates out, but the process can be combined into a more efficient single step. Next is the example to just to get this bad date over with, and see the success in Figure 5. Converted in one step.

\[
\text{proc sql;}
\text{create table work.dates2 as}
\text{select distinct}
\]

```sql
```
Now that we have successfully navigated a bad date, we can set up a macro for speed dating. Now that we have manipulated our dates in a more useable format we can leverage the INTNX function to create some simple macros to assist in setting automatic macro date parameters for your report.

Health insurance reporting is often reporting on data for the last full 12 months or maybe the last full quarter. Using INTNX we can quickly calculate that date span.

If we want to create a report based on the past twelve full months from today we can quickly create a macro for both the start and end date of that period so that the next time we create this report we don’t have to manually change our program.
First using a null DATA step we create a macro variable that sets today’s date.

```sas
data _null_; call symput('today','""||put(today(),date9.)||"d"'); run;
```

Next we create macros for the start and end date of our last twelve full months, based off the today macro variable.

```sas
data _null_; call symputx('start',PUT(INTNX('month',&today.,-12,'BEG'),date9.)); call symputx('end',PUT(INTNX('month',&today.,-1,'END'),date9.)); run;
$put ** &start. ** &end. ** ;
```

Using the PUT function lets us see the date in our log so we know what span the report ran on.

If we want to create BEG and END macro variables based on the previous quarter. Just change the INTNX option from ‘month’ to ‘qtr’.

```sas
(data _null_; call symputx('start1',PUT(INTNX('qtr',&today.,-1,'BEG'),date9.)); call symputx('end1',PUT(INTNX('qtr',&today.,-1,'END'),date9.)); run;
$put ** &start1. ** &end1. ** ;)
```
CONCLUSION

Without a few bad dates you will never know when you have a good date. With some clever string manipulation and INTNX macros an industrious SAS programmer can turn those bad dates around and build robust processes to ensure success even in the most awkward of dates.

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