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Moving dates around

A simplistic way to work with dates with monthly data in SAS is to convert all dates to a year and month, and then use those. For instance

```
data msf;
    set crsp.msf(keep=permno date ret);
    year=year(date);
    month=month(date);
run;
proc sort data=msf;
    by permno year month;
run;

proc means data=msf;
    by permno year;
    var ret;
run;
```

This is appealing when, say, you have to calculate within-year averages, but it can quickly get tedious if you have to do other simple tasks. For instance, suppose you want to create a series of *daily* dates from January 1, 1961 to December 31, 1962.

```
data dates;
  do year=1961 to 1962;
    do month=1 to 12;
        lengthofmonth=31;
        if month=4 or month=6 or month=9 or month=11 then lengthofmonth=30;
        if month=2 then lengthofmonth=28;
        do day=1 to lengthofmonth;
            output;
        end;
    end;
    end;
run;
```

This is terribly tedious - not to mention fraught with the danger that you'll make errors in leap years. The alternative is to use SAS' intnx function, which increments dates by specified intervals.

```
data dates;
   date='01Jan1961'd;
   do while(date<='31Dec1962'd);
      output;
      date=intnx('day', date, 1);
   end;
run;</pre>
```

The intnx function increments date (its second argument), by 1 unit (the third argument) of 'day' (its first argument).

The more astute among you will observe that I get the same effect by saying

```
data dates;
    date='01Jan1961'd;
```

```
do while(date<='31Dec1962'd);
      output;
      date=date+1;
    end;
run;</pre>
```

because dates are treated as numbers in SAS. This is well and good if I want to increment by single days. Suppose instead I want to increment by weekdays. That is, I want the list of all weekdays in 1961 and 1962. An easy way to do this is:

```
data dates;
  date='01Jan1961'd;
  do while(date<='31Dec1962'd);
     output;
     date=intnx('weekday', date, 1);
  end;
run;</pre>
```

which is a useful construct in working with the DSF file, and horrendously complicated to do any other way.

The intnx function, as already said, increments dates, but it does so in a nonintuitive way. Suppose you are incrementing by year.

```
date=intnx('year', date, 1);
```

Intnx moves the date to the first day of the subsequent year, not forward by one twelve-month period. If you say 'month' instead of 'year', intnx moves the date forward to the first day of the next month however many times you specify. Saying

```
date=intnx('month', date, 0);
```

moves the date to the beginning of the month - the first of the month- in which date falls. Similarly for 'gtr'.

I commonly use the intnx function to do the following:

Move the date to the end of the month/quarter/year

```
date=intnx('month', date, 1)-1;
date=intnx('qtr', date, 1)-1;
date=intnx('year', date, 1)-1;
```

Move the date to the beginning of the month/quarter/year

```
date=intnx('month', date, 0);
date=intnx('qtr', date, 0);
date=intnx('year', date, 0);
```

• Move the date to the end of the previous month

```
date=intnx('month', date, 0)-1;
```

• Move the date (which is an end-of-month) to the end of the next month

```
date=intnx('month', date+1, 1)-1;
```

Observe here that I have to say date+1. Since the date is currently of the form 31Jan1999, saying

```
date=intnx('month', date, 1)-1;
```

will leave us with 01Feb1999-1, or 31Jan1999.

• Move the date to the end of month 12 months ago

```
date=intnx('month', date, -11)-1;
```

• Move the date (which is an end-of-month) to the end of the 12 months ahead

```
date=intnx('month', date+1, 12)-1;
```

• Given a beginning date and an ending date, create a dataset with all the month-ends in between:

```
data beg_end;
  beginning_date='31Jan1996'd;
  ending_date='31Dec2007'd;
run;
data all_dates;
  set beg_end;
  date= beginning_date;
  date=intnx('month', date, 1)-1;
  do while(date<=ending_date);
    output;
    date=intnx('month', date+1, 1)-1;
  end;
run;</pre>
```

The first

```
date=intnx('month', date, 1)-1;
```

statement is to ensure that the first date is an end-of-month.

Produce a list of all Wednesdays between two dates:

```
data beg_end;
  beginning_date='31Jan1996'd;
  ending_date='31Dec2007'd;
run;

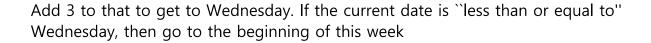
data all_dates;
  format date date9.;
  set beg_end;
  date=beginning_date;
  if weekday(date)>4 then date=intnx('week', date, 1)+3;
  else date=intnx('week', date, 0)+3;
  do while(date<=ending_date);
    output;
    date=intnx('week', date, 1)+3;
  end;
run;</pre>
```

The weekday() function returns the day of the week, 1 being Sunday. I make the first date a Wednesday (weekday=4) with

```
if weekday(date)>4 then date=intnx('week', date, 1)+3;
else date=intnx('week', date, 0)+3;
```

The logic is simple. If the current date is "more" than a Wednesday (ie, weekday(date)>4), then the first admissible date is Wednesday of next week. Sunday of next week is

```
date=intnx('week', date, 1);
```



date=intnx('week',	date,	0);

and add 3 to that.

The rest of the scheme is obvious. This is useful in constructing weekly returns (Thursday-to-Wednesday to avoid any weekend effect).

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