Subject: avoiding "floating illegal operand" errors with /nan keyword in mean
Posted by Paul Levine on Tue, 20 Aug 2013 23:37:29 GMT
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I have an array with 2800 rows, 2800 columns, and 120 layers, where each layer is a month from a 10-year time series). I would like to calculate annual means, so I will end up with an array that is 2800 x 2800 x 10. So

```
for j = 0, 9 do begin
 ; make one year subset of 2800x1800x12
 subset = array[*,*,j*12:j*12+12]
 newarray[0,0,j] = mean(newarray, dimension=3, /nan)
endfor
```

I am using the /nan keyword because there are a lot of NaNs in the data. As a result, I get
% Program caused arithmetic error: Floating illegal operand
whenever the mean function tries to calculate an average completely out of NaN values.

I know that I could just ignore the error, because the results are what I want them to be, but I'm sure it would be better to figure out how to prevent the error.

So, I tried the following method of checking to see whether I'm dealing with all NaNs

```
for j = 0, 9 do begin
 ; make one year subset of 2800x1800x12
 subset = array[*,*,j*12:j*12+12]
 if max(finite(subset)) eq 1 then begin
  newarray[0,0,j] = mean(newarray, dimension=3, /nan)
 endif else begin
  newarray[0,0,j] = make_array(2800,2800,value=!VALUES.D_NAN)
 endelse
endfor
```

This eliminates the error for any situation where the entire subset is NaN. However, because the mean function is essentially calculating 2800x2800 means of 12 elements each, there are instances where only one or a few of those 12-element sets are completely NaN, which is not caught by my method of checking, so I still get the error message.

The only way I can imagine extending my checking method would be to loop through every row and column of the data set, calculating each mean one at a time so that I can check whether or not all 12 elements are NaN. Of course, that would be incredibly inefficient, so I would

not seriously entertain that idea.

Is there a better solution out there, or should I just suck it up and live with the error message?