
Subject: Re: Bad data in structure (NaN HowTo?)

Posted by [Craig Markwardt](#) on Wed, 22 Nov 2000 08:00:00 GMT

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Randall Skelton <rhskelto@atm.ox.ac.uk> writes:

> I have an array of large structures which occasionally is filled (via an
> external C program) and passed into IDL with -12345 signifying the data
> for that element is lost. I would like to convert the occurrences of
> -12345 to NaN's in IDL but I am a little perplexed on how to do this.
>
> I had hoped that since this is technically an 'array' (albeit an array of
> structures) I would just be able to use the 'where' command; alas, it
> appears that structures are not allowed in the where command:
>
> B = where(atrl eq -12345, count)
> % Struct expression not allowed in this context: ATRL.

Hi Randall--

You have the 500-pound gorilla approach from Pavel. However, if your
-12345's appear in a few well defined fields in the structure, then
it's much easier and more efficient to do the following:

```
wh = where(atrl.field1 EQ -12345, ct)
if ct GT 0 then atrl(wh).field1 = -12345
```

However, if there are lots of fields then the 500-pound gorilla may be
what you need. You mentioned that integers and strings are the same
way. How can this be? There is no such thing as a NaN string or
integer.

If you do it in C, I would propose that you pass in the value of NaN
into your C procedure and then just use it there. That should be the
most portable. Then from the IDL side you would call your routine
with !VALUES.NaN

Cheers,
Craig

--

Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
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Subject: Re: Bad data in structure (NaN HowTo?)

Posted by [Pavel A. Romashkin](#) on Wed, 22 Nov 2000 08:00:00 GMT

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Randall Skelton wrote:

```
>  
> B = where(atrl eq -12345, count)  
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```

I would try something like

```
;Loop for each field.  
FOR I = 0, N_TAGS(atrl) - 1 DO BEGIN  
  type = size(atrl.(i), /type)  
  if (type lt 6) or (type gt 11) then begin  
    ; Assume no undefined tags are present.  
    ; If they are present, exclude type=0.  
    B = where(atrl.(i) eq -12345, count)  
    if count gt 0 then atrl.(i)[B] = !values.f_nan  
  endif  
ENDFOR
```

For multiple numerical fields, I'd use a loop. Given relatively small number of fields, this would not require vectorizing.

```
> Each structure has about 450 elements in it and is comprised itself of  
> strings, ints, floats and doubles and arrays of each of the above.
```

In your case, I'd automate the search for numerical fields, because I wouldn't be able to go through 450 fields myself. None of my business, but are you sure this is the best way to organize the data?

Cheers,
Pavel

Subject: Re: Bad data in structure (NaN HowTo?)

Posted by [Randall Skelton](#) on Thu, 23 Nov 2000 00:03:53 GMT

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Thanks to both Pavel and Craig for their help.

```
> In your case, I'd automate the search for numerical fields, because I  
> wouldn't be able to go through 450 fields myself. None of my business,  
> but are you sure this is the best way to organize the data?
```

I am certainly open to suggestions on how to organize this data... It is spectroscopic remote sensing data and during measurements I get a dump of all of the sensor data (every 2 seconds) and one high resolution spectrum

of the atmosphere. The 400+ items in the structure correspond to instrument readings (i.e. exact GMT time, spacecraft orientation data, latitude, longitude, etc...) and different data-streams (i.e. point arrays for each useful spectral window, an oversampled pointing mirror array, gyro arrays, etc...). The real kicker is that I am grouping a series of these measurements together as an array of structures as it is then much easier to plot and manipulate this beastly data with 'plot, atcalc.ind_time, atrl.latitude'. My real problem here is that occasionally I get data drop out in key areas and I have to fiddle to fill my structure in C. At the moment, if a calculated string is garbled I fill with an empty string which is no problem. For all others (shorts, longs, floats and doubles) I am using '-12345' to indicate bad data. Although I can try and use data thresholds to flag this as bad data when plotting, it tends to make a mess of things when I write files or do analyses. What would people suggest I do for bad ints, shorts, longs, and floats? Should I try to handle this better in C so as to avoid the problem in IDL?

All of my structures are created in ANSI C from data which originates in SQL databases. I currently interface to IDL via call_external (I am looking at the alternatives to call_external but for the moment this works).

All of this begs the question, how much data can one person plot and interpret at one time? The answer is: you'd be surprised! but you do need a *big* monitor :) and an 11x17 printer.

Cheers,
Randall

Subject: Re: Bad data in structure (NaN HowTo?)
Posted by [Martin Schultz](#) on Thu, 23 Nov 2000 08:00:00 GMT
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- > latitude, longitude, etc...) and different data-streams (i.e. point arrays
- > for each useful spectral window, an oversampled pointing mirror array,
- > gyro arrays, etc...).

On the second though... maybe its alright as it is? :-(

I see now that the amount of data you have is huge. Besides, it keeps coming, huh. Maybe then just make an interface to shield yourself from the 450 fields (which send chill down my spine) and let IDL handle the mess internally.

By the way, I thought you have an array of those structures. Replacing your -12345 can be done on all of the structures in the array in one step with the "500 lbs gorilla" method. IDL is smart enough to index all arrays in a field of a structure array.

Cheers,
Pavel

Subject: Re: Bad data in structure (NaN HowTo?)

Posted by [Craig Markwardt](#) on Tue, 28 Nov 2000 08:00:00 GMT

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Randall Skelton <rhskelto@atm.ox.ac.uk> writes:

- > Thanks to both Pavel and Craig for their help.
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- > I am certainly open to suggestions on how to organize this data... It is
- > spectroscopic remote sensing data and during measurements I get a dump of
- > all of the sensor data (every 2 seconds) and one high resolution spectrum

Randall, is it true that you are filling the -12345 values within your CALL_EXTERNAL procedure? If so, then perhaps you can try the second thing I suggested. Namely, in IDL create whatever "null" variables you want, either NaN or whatever. Then pass those variables into the CALL_EXTERNAL procedure. Then your C code can easily substitute those values wherever needed. However there is no such thing as NaN for integers so I'm not sure what you can do there.

Craig

--

Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
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