Subject: Re: where() and IEEE NaN
Posted by davidf on Fri, 05 Nov 1999 08:00:00 GMT
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Pavel Romashkin (promashkin@cmdl.noaa.gov) writes:

> I am not sure if trying to use WHERE on NaN is legitimate. NaN is a
> missing value by definition, and the request to WHERE those values is
> senseless.

Spoken like a software developer, Pavel! Bravo! :-)

> However, I'd too better like WHERE to complain than to
> quietly return some array.

Uh, well, yeah. :-(

> It does not seem to be a *practical* problem because NaNs don't sneak
> into your arrays unless you place them in.

Or, more likely read them from a file of someone else's
data, where they can sometimes cause all kinds of havoc.

> As for whether its right or wrong, I think someone said it before: iI am
> more interested in how to do what I need, not in how I think they did it
> wrong.

Really!? Now you sound like a computer programmer. I'm
confused. :-)

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting
Phone: 970-221-0438 E-Mail: davidf@dfanning.com
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Toll-Free IDL Book Orders: 1-888-461-0155

Subject: Re: where() and IEEE NaN
Posted by davidf on Fri, 05 Nov 1999 08:00:00 GMT
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William Thompson (thompson@orpheus.nascom.nasa.gov) writes:

> Isn't it simpler (and faster) to say
>
> IDL> print,where(a ne a)

Simpler. Yes. Faster. Yes.

But don't you think the poor sucker reading your
code 10 years from now will be scratching his head?

Cheers,

David
--
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Subject: Re: where() and IEEE NaN
Posted by Pavel Romashkin on Fri, 05 Nov 1999 08:00:00 GMT
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I am not sure if trying to use WHERE on NaN is legitimate. NaN is a missing value by definition, and the request to WHERE those values is senseless. However, I'd too better like WHERE to complain than to quietly return some array.

It does not seem to be a *practical* problem because NaNs don't sneak into your arrays unless you place them in. And if you do, then handle them accordingly.

As for whether its right or wrong, I think someone said it before: iI am more interested in how to do what I need, not in how I think they did it wrong.

Cheers,
Pavel

Todd Bowers wrote:

> IDL> a = [1,2,!Values.F_NaN,4,!Values.F_NaN]
> IDL> print, a
> 1.00000 2.00000 NaN 4.00000 NaN
> IDL> print, where(a EQ !Values.F_NaN)
> 0 1 2 3 4

>
> Hmmmmmm.... is this a known feature? The where() help says
> nothin' about NaN's.
> IDL v5.2a
>
> Thanks
> Todd

Subject: Re: where() and IEEE NaN
Posted by thompson on Fri, 05 Nov 1999 08:00:00 GMT
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badastro@smart.net (Philip Plait) writes:

> In article <7vv1j3$6ro$1@ra.nrl.navy.mil>,
> Todd Bowers <tbowers@nrlssc.navy.mil> wrote:
>> IDL> a = [1,2,!Values.F_NaN,4,!Values.F_NaN]
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>> 1.00000 2.00000 NaN 4.00000 NaN
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>> Hmmmmmm.... is this a known feature? The where() help says
>> nothin' about NaN's.
>> IDL v5.2a

> Incidentally, if you are looking for the element numbers
> of where a = NaN, try:

> IDL> print,where(a-a ne 0)
> 2 4

Isn't it simpler (and faster) to say

IDL> print,where(a ne a)

William Thompson

Subject: Re: where() and IEEE NaN
Posted by T Bowers on Fri, 05 Nov 1999 08:00:00 GMT
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AAARRRGGGHHH! It's like the movie.
IDL has hurt me, and it wishes to go on.... hurting me!

Thanks Dave, Eric, Philip.

Subject: Re: where() and IEEE NaN
Posted by badastro on Fri, 05 Nov 1999 08:00:00 GMT
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In article <7vv1j3$6ro$1@ra.nrl.navy.mil>,
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Incidentally, if you are looking for the element numbers
of where a = NaN, try:

IDL> print,where(a-a ne 0)
           2   4

;-)

* * * * * The Bad Astronomer * * * *

Phil Plait   badastro@badastronomy.com
The Bad Astronomy Web Page: http://www.badastronomy.com

Subject: Re: where() and IEEE NaN
Posted by davidf on Fri, 05 Nov 1999 08:00:00 GMT
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Todd Bowers (tbowers@nrlssc.navy.mil) writes:

> IDL> a = [1,2,!Values.F_NaN,4,!Values.F_NaN]
> IDL> print, a
>   1.00000   2.00000   NaN   4.00000   NaN
> IDL> print, where(a EQ !Values.F_NaN)
>   0   1   2   3   4

>
> Hmmmmmm.... is this a known feature?

Sure. Well known. :-)

I usually check for NANs like this:

```
  IDL> Print, Where( NOT Float( Finite(a) ) )
       2       4
```

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting
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Subject: Re: where() and IEEE NaN
Posted by korpela on Fri, 05 Nov 1999 08:00:00 GMT
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In article <7vv1j3$6ro$1@ra.nrl.navy.mil>,
Todd Bowers <tbowers@nrlssc.navy.mil> wrote:
> IDL> a = [1,2,!Values.F_NaN,4,!Values.F_NaN]
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>   0   1   2   3   4
>
> Hmmmmmm.... is this a known feature? The where() help says
> nothin' about NaN's.
> IDL v5.2a

Unfortunately, on some platforms IDL is not IEEE compliant which greatly
limits IDL's usefulness as a cross platform system. RSI could easily fix
this on most platforms with a compiler option, but they choose not to.
The only correct response for any array to "print,where(a eq !values.F_NaN)"
is "-1".

Eric

--
Eric Korpela | An object at rest can never be

korpela@ssl.berkeley.edu | stopped.
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Subject: Re: where() and IEEE NaN
Posted by korpela on Sat, 06 Nov 1999 08:00:00 GMT
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In article <7vvkuf$hk4@post.gsfc.nasa.gov>,
William Thompson <thompson@orpheus.nascom.nasa.gov> wrote:
> Isn't it simpler (and faster) to say
>
> IDL> print,where(a ne a)

It is on IEEE compliant platforms. But IDL on some platforms
is not IEEE compliant. My solution is not to use those platforms.
If forced to use one of those platforms by my employer, my solution would
be not to use IDL. Anyone at RSI listening?

Eric
--
Eric Korpela | An object at rest can never be
korpela@ssl.berkeley.edu | stopped.
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Subject: Re: where() and IEEE NaN
Posted by Vincenzo Andretta on Sat, 06 Nov 1999 08:00:00 GMT
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Try:

WHERE(FINITE(array,/NaN) eq 1)

Example:

```
IDL>  array=[1.0,!VALUES.F_Infinity,-!VALUES.F_Infinity,!VALUES.F_ NaN]
IDL> print,where(finite(array) eq 0)
       1       2       3
IDL> print,where(finite(array,/NaN) eq 1)
       3
IDL> print,where(finite(array,/infinity) eq 1)
       1       2
```

Note that IDL seems to be able to deal with "infinities", at least to some
extent:

```
IDL> print,min(array),max(array)
      -Inf         Inf
% Program caused arithmetic error: Floating illegal operand
IDL> print,1./array
     1.00000      0.00000     -0.00000         NaN
```

I wouldn't rely on this behaviour, but it is conceivable one might want
to know where NaN values are, while ignoring infinities.

Vincenzo Andretta
CUA,NASA/GSFC - Laboratory for Astronomy and Solar Physics
Greenbelt, MD 20771 - USA

P.S:

```
IDL> help,/structure,!version
** Structure !VERSION, 5 tags, length=80:
   ARCH            STRING    'alpha'
   OS              STRING    'OSF'
   OS_FAMILY       STRING    'unix'
   RELEASE         STRING    '5.2'
   BUILD_DATE      STRING    'Oct 30 1998'
```

Subject: Re: where() and IEEE NaN
Posted by korpela on Mon, 08 Nov 1999 08:00:00 GMT
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In article <806t4k$mt0@post.gsfc.nasa.gov>,
William Thompson <thompson@orpheus.nascom.nasa.gov> wrote:
> I thought the only platform that wasn't IEEE compliant was OpenVMS, where the
> VAX floating point notation doesn't included NaN values.

There are also problems on many X86 platforms, where one usually has to set
a compiler flag in order to get IEEE compatibile code out of the compilers.
I'm pretty sure the Windows version is not compliant. Don't know about the
linux versions.

> Actually, the comment that the above command is confusing to people who don't
> know what's going on is valid. Vincenzo's suggestion of using FINITE(/NaN) is

> probably better, and should be (at least) just as fast.

Point taken. I'll b&m about any numerical software that doesn't at least make
the attempt to be IEEE compliant, or at least consistant across platforms.

Eric
--
Eric Korpela | An object at rest can never be
korpela@ssl.berkeley.edu | stopped.
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Subject: Re: where() and IEEE NaN
Posted by badastro on Mon, 08 Nov 1999 08:00:00 GMT
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In comp.lang.idl-pvwave Eric J. Korpela <korpela@islay.ssl.berkeley.edu> wrote:
> In article <7vvkuf$hk4@post.gsfc.nasa.gov>,
> William Thompson <thompson@orpheus.nascom.nasa.gov> wrote:
>> Isn't it simpler (and faster) to say
>>
>> IDL> print,where(a ne a)

> It is on IEEE compliant platforms. But IDL on some platforms
> is not IEEE compliant. My solution is not to use those platforms.

I had a DEC Alpha for a few years that some, um, interesting
effects in IDL. I'm on a sparc now and have no problems.
I cannot remember the details now, but a couple of years ago we had
this NaN problem. I typed in print,where(a ne a) and it barfed. So
I did the workaround of hh = where(a-a ne 0) and it worked.

* * * * * The Bad Astronomer * * * *

Phil Plait badastro@badastronomy.com
The Bad Astronomy Web Page: http://www.badastronomy.com

Subject: Re: where() and IEEE NaN
Posted by Pavel Romashkin on Mon, 08 Nov 1999 08:00:00 GMT
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> Spoken like a software developer

Well, when you are trying to find a justification for the misbehavior of the
software you like, you tend to find logical excuses. Isn't that what

developers do when they did not think of something useful?

> Really!? Now you sound like a computer programmer. I'm
> confused. :-)

This is because I want to get some things done eventually. After all, isn't software developer a breed of computer programmer?

Sorry for the confusion, David. My beer debt is growing :-)

Cheers,
Pavel

Subject: Re: where() and IEEE NaN
Posted by thompson on Mon, 08 Nov 1999 08:00:00 GMT
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korpela@islay.ssl.berkeley.edu (Eric J. Korpela) writes:

> In article <7vvkuf$hk4@post.gsfc.nasa.gov>,
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> If forced to use one of those platforms by my employer, my solution would
> be not to use IDL. Anyone at RSI listening?

I thought the only platform that wasn't IEEE compliant was OpenVMS, where the VAX floating point notation doesn't included NaN values. However, didn't RSI recently change the OpenVMS version to use IEEE floating point numbers instead, so that it's now IEEE compliant too. Of course, it may be that I'm missing something more subtle, or there's some non-IEEE platform out there I'm not familiar with.

Actually, the comment that the above command is confusing to people who don't know what's going on is valid. Vincenzo's suggestion of using FINITE(/NaN) is probably better, and should be (at least) just as fast.

Cheers,

William Thompson

Subject: Re: where() and IEEE NaN
Posted by jsb on Thu, 11 Nov 1999 08:00:00 GMT
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William Thompson (thompson@orpheus.nascom.nasa.gov) wrote:
: I thought the only platform that wasn't IEEE compliant was OpenVMS, where the
: VAX floating point notation doesn't included NaN values. However, didn't RSI
: recently change the OpenVMS version to use IEEE floating point numbers instead,
: so that it's now IEEE compliant too. Of course, it may be that I'm missing

That is correct. Since the VAX predates IEEE arithmetic, and emulating it
is so putrescent, RSI decided to end support for IDL on the VAX as of V5.1,
IIRC. The Alpha/VMS version of IDL now uses IEEE arithmetic by default.