
Subject: Re: SIGN function: signof(num or array of num)
Posted by [H. Evans](#) on Tue, 16 Mar 2010 14:30:07 GMT
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On Mar 16, 2:57 pm, Carsten Lechte <c...@toppoint.de> wrote:
> F LDY Lajos wrote:
>> I think SIGNOF() should not cause an arithmetic error for finite numbers.
>
> I use the expression
>
> (x GT 0) -1* (x LT 0)
>
> to get the sign of e.g.
>
> x = [-2e4, 5, 0, 1d/0, -1d/0, 0d/0]
>
> but it uses 2 comparisons and even a multiplication. Does anyone have
> a simpler/faster version? Furthermore, what should the sign of NaN be?
>
> chl

Could be either + or -ve:
IDL> print,!values.f_nan, - !values.f_nan
NaN -NaN

Subject: Re: SIGN function: signof(num or array of num)
Posted by [Ding](#) on Tue, 16 Mar 2010 15:32:06 GMT
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On Mar 16, 1:31 pm, FÖLDY Lajos <fo...@rmki.kfki.hu> wrote:
> On Tue, 16 Mar 2010, Ding wrote:
>> Dear IDL users,
>
>> I cannot find the SIGN function in IDL procedures, but one in
>> Solarsoft ssw/maths/ SIGN which occupy the name, but different
>> purpose(sign(a)*b). so I wrote the SIGNOF() function which is to get
>> the sign of a number or array,
>
>> Hopefully I am not repeating someone' work! you are welcome to
>> comments!
>
>> return, fix(abs(input)/input)
>
> IDL> input=0 & help, fix(abs(input)/input)
> <Expression> INT = 0
> % Program caused arithmetic error: Integer divide by 0
>

> I think SIGNOF() should not cause an arithmetic error for finite numbers.
>
> regards,
> lajos

This is expected in my algorithm, as the sign of 0 is considered to be 0. although there is an error in the IDL language, however 0/0=0, is still true. the power of this in array calculation

```
IDL> a=[[1,0],[-1,0]]
IDL> print,signof(a)
   1  0
  -1  0
```

Ding Yuan

Subject: Re: SIGN function: signof(num or array of num)
Posted by [Carsten Lechte](#) on Tue, 16 Mar 2010 15:35:58 GMT
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H. Evans wrote:
> Could be either + or -ve:
> IDL> print,!values.f_nan, - !values.f_nan
> NaN -NaN

Then, a totally different approach might be necessary to get it completely right.

FINITE() tells you if you have a NaN, but since every comparison that involves NaNs evaluates to FALSE, you cannot find out if it's + or -NaN be equating to !VALUES.F_NAN.

One would have to extract the sign bit (assuming IEEE format, taking into account endianness, precision etc.) and base the calculation on that.

For my private version, I will add a term + (FINITE(x) EQ 0) so all NaNs are assumed positive, since the one value that SIGNUM(NaN) should not have is 0.

I wonder in what situation one would care about the correct sign of something that is not a number.

chl

Subject: Re: SIGN function: signof(num or array of num)

Posted by [Ding](#) on Tue, 16 Mar 2010 15:43:49 GMT

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On Mar 16, 10:51 am, Ding <gardener_2...@hotmail.com> wrote:

```
> Dear IDL users,
>
> I cannot find the SIGN function in IDL procedures, but one in
> Solarsoft ssw/maths/ SIGN which occupy the name, but different
> purpose( sign(a)*b). so I wrote the SIGNOF() function which is to get
> the sign of a number or array,
>
> Hopefully I am not repeating someone' work! you are welcome to
> comments!
>
> ; return the sign of the input data in an array of the same size
> ; -1 for negative elements
> ; 1 for positive elements
> ; 0 for 0 and complex number
> ; only works for numerics
```

```
return the sign of the input data in an array of the same size
```

```
-1 for negative elements
```

```
1 for positive elements
```

```
0 for 0 and complex number
```

```
only works for numerics
```

```
>a=[[1,-2],[0,3]]
```

```
> print, signof(a)
```

```
1      -1
```

```
0      1
```

```
>
```

More notes:

although signof(0) cause algorithm error, since 0/0 is defined as 0,

signof(0)=0, signof(Inf)=0. it can be used in an expression

signof(numeric variable or array)*10.0/5. etc.

Subject: Re: SIGN function: signof(num or array of num)

Posted by [Carsten Lechte](#) on Tue, 16 Mar 2010 15:46:34 GMT

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Ding wrote:

```
> IDL> a=[[1,0],[-1,0]]
```

```
> IDL> print,signof(a)
```

```
> 1 0
```

```
> -1 0
```

Still, you should mention under RESTRICTIONS that the input must be an integer type:

```
IDL> a=[[1,0],[-1,0]]
IDL> print, signif(a)
      1      0
     -1      0
% Program caused arithmetic error: Integer divide by 0
IDL> print, signif(double(a))
      1 -32768
     -1 -32768
% Program caused arithmetic error: Floating illegal operand
IDL> print, signif(complex(a))
      1 -32768
     -1 -32768
% Program caused arithmetic error: Floating illegal operand
```

chl

Subject: Re: SIGN function: signif(num or array of num)
Posted by [Ding](#) on Tue, 16 Mar 2010 16:17:54 GMT
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On Mar 16, 3:46 pm, Carsten Lechte <c...@toppoint.de> wrote:

```
> Ding wrote:
>> IDL> a=[[1,0],[-1,0]]
>> IDL> print,signif(a)
>>      1  0
>>     -1  0
>
> Still, you should mention under RESTRICTIONS that the
> input must be an integer type:
>
> IDL> a=[[1,0],[-1,0]]
> IDL> print, signif(a)
>      1      0
>     -1      0
> % Program caused arithmetic error: Integer divide by 0
> IDL> print, signif(double(a))
>      1 -32768
>     -1 -32768
> % Program caused arithmetic error: Floating illegal operand
> IDL> print, signif(complex(a))
>      1 -32768
>     -1 -32768
> % Program caused arithmetic error: Floating illegal operand
```

```
>
> chl
```

This is all the information I have, including the !version:

```
IDL> print,!version
{x86_64 linux unix linux 6.4 Apr 26 2007    64    64}
IDL> print,a
  1    0
 -1    0
IDL> print,double(a)
  1.0000000  0.0000000
 -1.0000000  0.0000000
IDL> print,complex(a)
(  1.00000,  0.00000)(  0.00000,  0.00000)
( -1.00000,  0.00000)(  0.00000,  0.00000)
IDL> print,signof(a)
  1    0
 -1    0
% Program caused arithmetic error: Integer divide by 0
IDL> print,signof(double(a))
  1    0
 -1    0
% Program caused arithmetic error: Floating illegal operand
IDL> print,signof(complex(a))
  1    0
 -1    0
% Program caused arithmetic error: Floating illegal operand
IDL>
```

Let's compare the version of the result and see if it is IDL or processor that cause the difference!

Subject: Re: SIGN function: signof(num or array of num)
Posted by [Carsten Lechte](#) on Tue, 16 Mar 2010 16:25:45 GMT
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Ding wrote:

```
> IDL> print,!version
> { x86_64 linux unix linux 6.4 Apr 26 2007    64    64}
```

Mine is:

```
{ x86    linux unix linux 6.4 Apr 26 2007    32    64}
```

and I confirmed your results on a 64bit machine.

chl

Subject: Re: SIGN function: signof(num or array of num)
Posted by [Carsten Lechte](#) on Tue, 16 Mar 2010 16:36:54 GMT
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I wrote:

- > One would have to extract the sign bit (assuming IEEE format,
- > taking into account endianness, precision etc.) and base the
- > calculation on that.

Alternatively, one could read the documentation and discover the
SIGN keyword to the FINITE() function ;-)

chl

Subject: Re: SIGN function: signof(num or array of num)
Posted by [Foldy Lajos](#) on Tue, 16 Mar 2010 16:41:33 GMT
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On Tue, 16 Mar 2010, Ding wrote:

- > although signof(0) cause algorithm error, since 0/0 is defined as 0,
- > signof(0)=0, signof(Inf)=0. it can be used in an expression
- > signof(numeric variable or array)*10.0/5. etc.

0/0 is undefined in mathematics.

regards,
lajos
