
Subject: Re: fastest way to find the first non-zero value in an array

Posted by [Clemens](#) on Tue, 08 Apr 2008 08:42:50 GMT

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it depends on the size of array. Small array is a simple loop.

Huge one can be :

```
index_arr = where( arr NE 0)
print, index_arr[0]
```

on very huge arrays you can divide arr into big peaces.

Clemens

<smasson@locean-ipsi.upmc.fr> schrieb im Newsbeitrag
news:ff3bf651-8707-47e8-8cff-5e694dd5622f@m71g2000hse.google groups.com...

> Hi,

>

> I want to find the first non-zero value of an array. Is there a faster
> way to do this than with the "where" command: (where(array ne 0))[0]
> "Where" will look for all non-zero values and I only need the first
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> as soon as it found one element...

>

> sebastien

Subject: Re: fastest way to find the first non-zero value in an array

Posted by [Spon](#) on Tue, 08 Apr 2008 13:03:51 GMT

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On Apr 8, 9:04 am, smas...@locean-ipsi.upmc.fr wrote:

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Hi Sebastien,

I can think of two separate ways of going about it:

Firstly, for certain arrays it may be perfectly sensible to use the
'inefficient', FORTRAN 101 route:

```

i = 0
WHILE Array[i] EQ 0 DO i++
RETURN, i

```

Secondly, I've attempted to do it using HISTOGRAM below.

```

; Is the first element non-zero?
; If it is, we can save ourselves a lot of
; hassle...
IF Array[0] NE 0 THEN RETURN, 0L

; We now know element 0 contains data = 0.
; Generate a histogram of the array such
; that this element will always be put in the
; first bin:
H = HISTOGRAM(CEIL(ABS(Array)), REVERSE_INDICES = RI)

; Are there non-zero elements in the array?
IF N_ELEMENTS(H) EQ 1 THEN MESSAGE, $
'Array contains only zeroes!'

; Array[0] is always going to be in the first bin.
; Get the contents of that bin:
BinContents = RI[RI[0]:RI[1]-1]

; How many drops in that bin?
NBC = N_ELEMENTS(BinContents)

; Where do the drop indices stop increasing linearly?
; That's where the first non-zero element must be.
Index = WHERE((LINDGEN(NBC) - BinContents) NE 0, Count)

; If all the zeroes in the array come before the first
; non-zero value, then we won't get any indices returned,
; but the next index will be the next element after the
; end of our BinContents vector. This must be non-zero.
IF Count EQ 0 THEN RETURN, NBC

; Otherwise, use the WHERE results to return
; the index of first non-zero element of the array.
RETURN, Index[0]

```

As far as I can tell, both methods work; and which is going to be faster (between these two and just using WHERE) is going to depend on your array.

Let us know how you get on,

Regards,

Chris

Subject: Re: fastest way to find the first non-zero value in an array

Posted by [Vince Hradil](#) on Tue, 08 Apr 2008 13:15:22 GMT

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On Apr 8, 3:04 am, smas...@locean-ipsi.upmc.fr wrote:

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> sebastien

Wow - I'd be interested in knowing how slow 'where' is. Are we talking the difference between 0.01 seconds and 0.05 seconds? Or even the difference between 1 and 5 seconds? Time is money, but at what point does our 'need for speed' end?

Subject: Re: fastest way to find the first non-zero value in an array

Posted by [David Fanning](#) on Tue, 08 Apr 2008 13:34:38 GMT

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Vince Hradil writes:

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> talking the difference between 0.01 seconds and 0.05 seconds? Or even
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I've gotten to the point where anything that takes less time than it takes to go get a cup of coffee is fast enough. I used to think fast, elegant programs were required. But when you are writing one-offs day after day, why bother? With Starbucks just across the street, I can afford to be a little loose with a FOR loop.

Cheers,

David

P.S. That said, I just spent the entire weekend re-working a program I inherited from someone else. It is generally a good idea to write a program in such a way that someone else can get it to work in less time than it takes to write the darn thing from scratch. :-)

--

David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: <http://www.dfanning.com/>
Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: fastest way to find the first non-zero value in an array
Posted by [Spon](#) on Tue, 08 Apr 2008 13:56:33 GMT
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On Apr 8, 2:15 pm, Vince Hradil <hrad...@yahoo.com> wrote:

> On Apr 8, 3:04 am, smas...@locean-ipsl.upmc.fr wrote:

>

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You make a good point, Vince.

If anyone can find an array that IDL actually searches faster using my Histogram-and-small-Where setup than by using "Where" on its own, let me know! :-)

Chris

Subject: Re: fastest way to find the first non-zero value in an array
Posted by [Vince Hradil](#) on Tue, 08 Apr 2008 14:02:38 GMT

On Apr 8, 8:34 am, David Fanning <n...@dfanning.com> wrote:

> Vince Hradil writes:
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> David Fanning, Ph.D.
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> Coyote's Guide to IDL Programming:<http://www.dfanning.com/>
> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Exactly - the google-mentality is making everyone think that 10 seconds is too long to wait for anything. But this makes sense to me: it take about 2-4 hours for the scientist to acquire the data for a certain experiment, it takes me about the same time to create the one-off and run the analysis for said experiment. Sure I could spend about 8 hours to tweak the analysis to make it run in 5 minutes instead of half-an-hour, but why bother. Unless, of course we need that extra half-hour? Then I end up writing some obfuscated code (http://en.wikipedia.org/wiki/Obfuscated_code) that uses histograms, and the next developer that comes along just says, 'unh?' and re-writes the whole thing.

Subject: Re: fastest way to find the first non-zero value in an array
Posted by [karo03de](#) on Wed, 09 Apr 2008 20:02:32 GMT
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On 8 Apr., 10:42, "Clemens" <yy...@hotmail.com> wrote:

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What about the system function ARRAY_EQUAL ?

Karsten