
Subject: Interesting property of sort

Posted by [cmancone](#) on Wed, 16 May 2007 12:41:05 GMT

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while attempting to build a faster star matching algorithm, I "discovered" an interesting property of sort - or, an interesting use for it. Of course, you guys have all probably seen this before anyway, but I thought I would share it because it can be very useful. Essentially, I found the easy way to make a sort lookup table. So, let's say you have the array:

```
test = [5,4,1,3,2]
```

and you sort it:

```
sortindex = sort(test)
sorted = test[sortindex]
```

now, what if you want to know where the 5 (or any other number) ended up in the sorted array? It turns out that you can make a lookup table by simply sorting sortindex.

```
lookup = sort(sortindex)
```

so, if you wanted to know where the first element of test ended up in the sorted list, you would say:

```
print,lookup[0]
; prints "4"
print,sorted[lookup[0]]
; prints "5"
```

In retrospect, I suppose this result isn't suprising, and probably should have been immediately obvious. Still, I thought I'd share.

Subject: Re: Interesting property of sort

Posted by [David Fanning](#) on Wed, 16 May 2007 13:50:21 GMT

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cmancone@ufl.edu writes:

```
> excellent point, thanks for the tip. Out of curiosity, does bsort add
> a lot of overhead compared to a regular sort?
```

I don't know. I rarely sort a million things. :-)

My experience with NASA Astronomy routines is that

there are fewer IDL programs any better. This is a bubble sort. Not the fastest sorting algorithm in the world, probably. But at least you know it is accurate.

Cheers,

David

--

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: Interesting property of sort

Posted by [cmancone](#) on Wed, 16 May 2007 14:23:53 GMT

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Ahhh... Bsort = bubble sort (duh!). I glanced at the code for bsort real fast, but I didn't look in depth. I thought it used the built in IDL sort routine and then added some code to force it to keep stuff in the proper order. I didn't realize it's a whole new implementation of a bubble sort. Do you happen to know what type of sort the built in idl sort routine implements?

On May 16, 9:50 am, David Fanning <n...@dfanning.com> wrote:

> cmanc...@ufl.edu writes:

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>> a lot of overhead compared to a regular sort?

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> I don't know. I rarely sort a million things. :-)

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> Cheers,

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> David

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Subject: Re: Interesting property of sort
Posted by [David Fanning](#) on Wed, 16 May 2007 14:37:30 GMT
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cmancone@ufl.edu writes:

> Ahhh... Bsort = bubble sort (duh!). I glanced at the code for bsort
> real fast, but I didn't look in depth. I thought it used the built in
> IDL sort routine and then added some code to force it to keep stuff in
> the proper order. I didn't realize it's a whole new implementation of
> a bubble sort. Do you happen to know what type of sort the built in
> idl sort routine implements?

Humm. Well, I haven't looked at it in a long time.
Looks to me like BSORT uses the IDL SORT command to
get the initial cut. (And I have NO idea what algorithm
is used for that. It is the standard OS SORT routine,
I'm sure.) Then, the equal "clumps" are processed to
put the values in the right order.

It looks like it uses a WHERE and SHIFT to find the
clumps of equal values. So there would be *some*
additional overhead. I guess it will depend on how
many overlaps you have.

If you were sorting integers, it might be faster to
use some kind of HISTOGRAM method, but this looks fine
to me as a general purpose sort of any data type.

Cheers,

David

--

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Subject: Re: Interesting property of sort
Posted by wlandsman@jhu.edu on Wed, 16 May 2007 15:55:32 GMT
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> get the initial cut. (And I have NO idea what algorithm
> is used for that. It is the standard OS SORT routine,

> I'm sure.)

>

That's right, the IDL SORT uses the sort algorithm of the OS, so the way it treats equal values depends on the OS. From previous discussions here, I believe that most Linux systems preserve order for equal values, but Windows and Mac OSX do not. I've been tempted to update bsort.pro to just call SORT if the user is on the "right" OS, but that sort (pun intended) of coding is difficult to maintain. --
Wayne

Subject: Re: Interesting property of sort

Posted by [cmancone](#) on Wed, 16 May 2007 16:52:24 GMT

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Interesting. That explains a lot. I had checked the results of my sort to see whether or not it maintained order for equal value points, and I didn't see any loss of order. When it was suggested to use bsort to maintain the order, I just assumed that sort happened to get it right for the things I checked. I guess I really just didn't have to worry, since I'm on linux.

On May 16, 11:55 am, "wlands...@jhu.edu" <wlands...@gmail.com> wrote:

>> Humm. Well, I haven't looked at it in a long time.

>> Looks to me like BSORT uses the IDL SORT command to

>> get the initial cut. (And I have NO idea what algorithm

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> equal values, but Windows and Mac OSX do not. I've been tempted to
> update bsort.pro to just call SORT if the user is on the "right" OS,
> but that sort (pun intended) of coding is difficult to maintain. --
> Wayne

Subject: Re: Interesting property of sort

Posted by [David Fanning](#) on Wed, 16 May 2007 17:01:42 GMT

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cmancone@ufl.edu writes:

> I guess I really just didn't have

> to worry, since I'm on linux.

I would say you don't have to worry if the software is running on YOUR machine. You will have to worry a great deal if it ever sneaks onto another machine.

Cheers,

David

P.S. People make a BIG mistake thinking they will be the only ones to run their software, no matter how badly the software is written. I'm looking at a piece of software right now that no one imagined would be running on MY machine. :-)

--

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Subject: Re: Interesting property of sort

Posted by [cmancone](#) on Thu, 17 May 2007 17:55:33 GMT

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That is a very good point. Actually, I should have realized that myself. Although my machine is a linux box, my machine is also a very old linux box. I often ssh into other computers on my network to steal their unused processor cycles (shh!!! don't tell anyone). My favorite is my advisor's - he's got a very nice mac with a dual core G5. It's very nice to be able to ssh into his computer and get an instant 5x speed up.

p.s. I'm not actually stealing processor cycles. My advisor is well aware that I do this :)

On May 16, 1:01 pm, David Fanning <n...@dfanning.com> wrote:

> cmanc...@ufl.edu writes:

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>> to worry, since I'm on linux.

>

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