Subject: Re: Weird MIN behavior
Posted by David G. Grier on Sun, 20 Feb 2005 22:28:26 GMT
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Hi There,

Michael Wallace wrote:

> Can someone explain this?

[snip]

> Abnormal case; why doesn't this work?
>
> IDL> a = [1.0, 2.0, 3.0, 4.0, 5.0]
> IDL> r = dblarr(2)
> IDL> r[0] = min(a, MAX = r[1])
> % MIN: Expression must be named variable in this context: <DOUBLE ((
> 0.00000, 0.00000))>.

The error message says it all: r[1] is an element of an array
rather than a variable. Here's a version that works:

IDL> r[0] = min(a, MAX = b)
IDL> r[1] = b

TTFN,

David

Subject: Re: Weird MIN behavior
Posted by Mark Hadfield on Sun, 20 Feb 2005 22:42:03 GMT
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Michael Wallace wrote:
> Can someone explain this?
>
>
> Normal case; everything works as you expect.
>
> IDL> a = [1.0, 2.0, 3.0, 4.0, 5.0]
> IDL> b = min(a, MAX = c)
> IDL> print, b, c
> 1.00000 5.00000
>
>
> Abnormal case; why doesn't this work?

>
> IDL> a = [1.0, 2.0, 3.0, 4.0, 5.0]
> IDL> r = dblarr(2)
> IDL> r[0] = min(a, MAX = r[1])
> % MIN: Expression must be named variable in this context: <DOUBLE ((
> 0.00000, 0.00000))>.

It's complaining about the argument passed to the MAX keyword. As it says, this must be a named variable, and a subscripted variable does not qualify because it is passed by value. You're lucky that IDL tells you that it doesn't accept a subscripted variable here--in other situations it quitely leaves the value unmodified and let's you puzzle it out later.

See IDL documentation on "Parameter Passing Mechanism". Also David Fanning's site has relevant material, eg see the info about the correct use of the ARG_PRESENT function in

http://www.dfanning.com/tips/keyword_check.html

and also

http://www.dfanning.com/tips/read_subscripted_array.html

--
Mark Hadfield "Ka puwaha te tai nei, Hoea tatou"
m.hadfield@niwa.co.nz
National Institute for Water and Atmospheric Research (NIWA)

Subject: Re: Weird MIN behavior
Posted by Michael Wallace on Mon, 21 Feb 2005 01:12:21 GMT
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Mark Hadfield wrote:
> Michael Wallace wrote:
>
>> Can someone explain this?
>>
>>
>> Normal case; everything works as you expect.
>>
>> IDL> a = [1.0, 2.0, 3.0, 4.0, 5.0]
>> IDL> b = min(a, MAX = c)
>> IDL> print, b, c
>> 1.00000 5.00000
>>
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>> Abnormal case; why doesn't this work?
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>> IDL> a = [1.0, 2.0, 3.0, 4.0, 5.0]
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>> 0.00000, 0.00000))>.
>
>
> It's complaining about the argument passed to the MAX keyword. As it
> says, this must be a named variable, and a subscripted variable does not
> qualify because it is passed by value. You're lucky that IDL tells you
> that it doesn't accept a subscripted variable here--in other situations
> it quitely leaves the value unmodified and let's you puzzle it out later.

Thanks. I had no clue what the message meant by "named variable." You wouldn't believe how long I stared at that error message trying to figure out what it meant. I knew things would work when I used non-subscripted variables, but the message still didn't make sense. Now, the message could have said "Look you idiot, a subscripted variable is sent by value, so the function can't modify the value. This probably isn't what you want." Now that makes sense. ;-)

I guess I had gotten it into my head that since you can change primitive values within a function by using KEYWORD = value, you must also be able to change array elements as well. It shouldn't surprise me that IDL is backwards. In every other language, arrays and array elements are passed by reference and primitives are passed by value.

This will get added to my ever growing list of gotchas.

-Mike

Subject: Re: Weird MIN behavior
Posted by David Fanning on Mon, 21 Feb 2005 01:31:04 GMT
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Michael Wallace writes:

> In every other language, arrays and array elements are
> passed by reference and primitives are passed by value.

Really!? Yet one more reason to put off learning C++. :-)

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Weird MIN behavior
Posted by Michael Wallace on Mon, 21 Feb 2005 01:56:31 GMT
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>> In every other language, arrays and array elements are
>> passed by reference and primitives are passed by value.
>
>
> Really!? Yet one more reason to put off learning C++. :-)

Yes. Really. In C/C++, primitives are sent by value. If you need to modify the value from within the function, you have to send the reference to the variable instead. Arrays are automatically passed by reference. In fact, it's possible to work with an array just like it's a contiguous series of references.

Java is similar, except all primitive variables are passed by value. Always. There's no way around this. All objects (including arrays) are sent by reference.

Other languages, except IDL, have similar ideas when it comes to pass by reference and value.

-Mike

Subject: Re: Weird MIN behavior
Posted by James Kuyper on Tue, 22 Feb 2005 00:13:47 GMT
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Michael Wallace wrote:
...
> backwards. In every other language, arrays and array elements are
> passed by reference and primitives are passed by value.

The two languages I'm most familiar with are C and C++. In both of those languages, whether an array element is passed by reference only if it has an array type. If the element type is a scalar, it's passed by value, not by reference.

Subject: Re: Weird MIN behavior
Posted by Michael Wallace on Tue, 22 Feb 2005 00:49:06 GMT
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>> backwards. In every other language, arrays and array elements are
>> passed by reference and primitives are passed by value.
>
>
> The two languages I'm most familiar with are C and C++. In both of
> those languages, whether an array element is passed by reference only
> if it has an array type. If the element type is a scalar, it's passed
> by value, not by reference.
>

Ah, yes. I misspoke. A lot of the time I work with the arrays elements
as pointers, so I just begin to think that everything is a pointer. But
yes, if an array element is a scalar, it will be passed by value.

-Mike

Subject: Re: Weird MIN behavior
Posted by David Fanning on Tue, 22 Feb 2005 00:56:11 GMT
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Michael Wallace writes:

> Ah, yes. I misspoke. A lot of the time I work with the arrays elements
> as pointers, so I just begin to think that everything is a pointer. But
> yes, if an array element is a scalar, it will be passed by value.

I know the feeling. I told someone the other day that
I thought I had completely forgotten how to write a
real widget program. Everything I touch these days are
objects. What a wonderful world to live in. :-)

Cheers,

David

P.S. Well, it *would* be wonderful if I could count on
"as advertised" consistencyy. But the programs running on
my machine are things of beauty. :-)

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/
