Subject: Re: How to apply a function to an array?
Posted by Timm Weitkamp on Fri, 13 May 2005 09:25:51 GMT
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Today at 11:05, Antonio Santiago wrote:

> W. Eremeev wrote:
>> Suppose, I have a function with one scalar argument, returning a scalar
>> and an array of values.
>> I want to get another array with the same dimensions, containing
>> results of application of my function to the values in the first array.
>>
>> R (www.r-project.org) has such functions (apply, lapply, sapply).
>> They take vectors or matrices and functions as arguments and return
>> arrays.
>>
>> What about IDL?
>>
> R is a functional programming language whereas IDL not. This means the
> working philosophy is pretty diferent.
>
> Sorry :(, but I dont know if there is a function or procedure in IDL
> that executes an specified function over a set of data. Perhaps you must
> think in terms of loops.

That said, any IDL function that returns a scalar expression for a single
scalar argument should (and usually does) also accept an array as the
argument, and return an array of the same dimensions. (Which eliminates
the need for an "apply" function.)

Example: the SIN function.

```
  IDL> a = !pi/4
  IDL> print, sin(a)
      0.707107

  IDL> b = [0, !pi/4, !pi/2]
  IDL> print, sin(b)
      0.00000    0.707107     1.00000

  IDL> c = findgen(2,3,4)
  IDL> help, sin(c)
  <Expression>   FLOAT    = Array[2, 3, 4]
```

The situation is different for functions that reduce the dimensions of the
input array (such as MAX or TOTAL). Some of these functions (the number is
growing with every release of IDL) allow the user to specify a specific
dimension of the input array to which the function should be applied. For

those functions that don't, it is useful to have a look at Craig
Markwardt's CMAPPLY routine.

Cheers,
Timm

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