
Subject: Check if coordinate is in array

Posted by [Thomas Gutzler](#) on Thu, 20 Feb 2003 03:34:03 GMT

[View Forum Message](#) <> [Reply to Message](#)

Hi again.

Here is the daily riddle:

Is there a faster way to check, if a coordinate (2-element array) is element of an array of coordinates (2,n-element array) than this:

```
FUNCTION is_element_of_2D, x, arr
  xidx = WHERE(arr[0,*] EQ x[0], c1)
  yidx = WHERE(arr[1,*] EQ x[1], c2)
  IF (c1 + c2 GT 0) THEN tmp = WHERE(MATRIX_MULTIPLY(xidx, $
    1./TRANPOSE(yidx)) EQ 1, c3) ELSE c3 = 0
  RETURN, c3 NE 0
END
```

Example:

```
arr = [[1,2], [3,4], [3,2]]
```

```
x = [3,4]
```

```
y = [2,3]
```

```
print, is_element_of_2D(x, arr)
```

```
print, is_element_of_2D(y, arr)
```

Tom

Subject: Re: Check if coordinate is in array

Posted by [Chris\[1\]](#) on Thu, 20 Feb 2003 14:36:48 GMT

[View Forum Message](#) <> [Reply to Message](#)

"Thomas Gutzler" <tgutzler@ee.uwa.edu.au> wrote in message
news:3E544CAB.6020006@ee.uwa.edu.au...

> Hi again.

>

> Here is the daily riddle:

> Is there a faster way to check, if a coordinate (2-element array) is

> element of an array of coordinates (2,n-element array) than this:

>

> FUNCTION is_element_of_2D, x, arr

> xidx = WHERE(arr[0,*] EQ x[0], c1)

> yidx = WHERE(arr[1,*] EQ x[1], c2)

> IF (c1 + c2 GT 0) THEN tmp = WHERE(MATRIX_MULTIPLY(xidx, \$

> 1./TRANPOSE(yidx)) EQ 1, c3) ELSE c3 = 0

> RETURN, c3 NE 0

> END

>

Wouldn't it be faster to do the following:

```
:: initialize the return value
c2 = 0
;; find the matching first coordinates
xidx = where(arr[0,*] eq x[0],c1)
;;search only among coordinates where the first matches
if c1 gt 0 then yidx = where(arr[1,xidx] eq x[1],c2)
return, c2 gt 0
```

Note also that it is possible that an element of your yidx might be zero, which is going to cause you some problems.

Chris

Subject: Re: Check if coordinate is in array
Posted by [condor](#) on Thu, 20 Feb 2003 22:30:22 GMT
[View Forum Message](#) <> [Reply to Message](#)

Thomas Gutzler <tgutzler@ee.uwa.edu.au> wrote in message
news:<3E544CAB.6020006@ee.uwa.edu.au>...

> Hi again.

>

> Here is the daily riddle:

> Is there a faster way to check, if a coordinate (2-element array) is
> element of an array of coordinates (2,n-element array) than this:

>

> FUNCTION is_element_of_2D, x, arr

> xidx = WHERE(arr[0,*] EQ x[0], c1)

> yidx = WHERE(arr[1,*] EQ x[1], c2)

> IF (c1 + c2 GT 0) THEN tmp = WHERE(MATRIX_MULTIPLY(xidx, \$

> 1./TRANPOSE(yidx)) EQ 1, c3) ELSE c3 = 0

> RETURN, c3 NE 0

> END

>

> Example:

> arr = [[1,2], [3,4], [3,2]]

> x = [3,4]

> y = [2,3]

> print, is_element_of_2D(x, arr)

> print, is_element_of_2D(y, arr)

>

> Tom

I don't know the context of this snippet of code, but in my math background there is the strong notion that all plane geometry should

always be done in complex numbers as you get the whole world of Wirtinger calculus for free.

In IDL you get this:

```
IDL> help,f,g
F      COMPLEX = ( 1.00000, 2.00000)
G      COMPLEX = Array[4]
IDL> print,g,format='(10(2i2,3x))'
 3 4  8 3  1 2  4 5
IDL> print,where(g eq f)
      2
```

So if you could keep your coordinates in complex variables from the beginning, you can match them and compare them to each other and such...
