Subject: Re: How to calculate the curve area?
Posted by Benjamin Hornberger on Tue, 21 Jun 2005 19:49:04 GMT
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Julio wrote:
> Hello!
>
> Although my question is very simple, I haven't got it.
> I'm using PLOT command to plot curve from a 2D matrix. My problem is I
> need to calculate the area bellow the curve.
>

How about using TOTAL() on the dataset (if it is equally spaced)?

Benjamin

Subject: Re: How to calculate the curve area?
Posted by Julio[1] on Tue, 21 Jun 2005 20:04:19 GMT
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Hi Benjamin.

The total command returns me returns the sum of the elements of an
array. However, I need to find the area of the curve.

I found the TSUM.PRO routine (see below), it calculates the integrated
area of a curve. I think it is what I need,
Thanks at any rate,
Julio

http://idlastro.gsfc.nasa.gov/ftp/pro/math/tsum.pro

Subject: Re: How to calculate the curve area?
Posted by Benjamin Hornberger on Tue, 21 Jun 2005 20:19:48 GMT
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Julio wrote:
> Hi Benjamin.
>
> The total command returns me returns the sum of the elements of an
> array. However, I need to find the area of the curve.
>

Well, as long as the dataset is equally spaced on the X axis, the result
from TOTAL is proportional to the area under the curve. If it's not

equally spaced, you could interpolate. It's just a question of the units
on each axis. Or am I missing something?

Benjamin

Subject: Re: How to calculate the curve area?
Posted by Paul Van Delst[1] on Tue, 21 Jun 2005 20:30:32 GMT
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Julio wrote:
> Hi Benjamin.
>
> The total command returns me returns the sum of the elements of an
> array. However, I need to find the area of the curve.
>
> I found the TSUM.PRO routine (see below), it calculates the integrated
> area of a curve. I think it is what I need,
> Thanks at any rate,
> Julio
>
> http://idlastro.gsfc.nasa.gov/ftp/pro/math/tsum.pro
>

You could use the INT_TABULATED IDL function.

Or use Simpson's rule. I have a integral.pro routine that does this. From the header:

```
; CALLING SEQUENCE:
;       result = integral( x, y )
;
; INPUTS:
;       x:  Vector of abscissa points. Elements must be unique and monotonically
;           increasing.
;
;       y:  Vector of corresponding ordinate points.
;
; EXAMPLE:
;       Define 11 x-values on the closed interval [0.0 , 0.8].
;
;         IDL> x = [ 0.0, .12, .22, .32, .36, .40, .44, .54, .64, .70, .80 ]
;
;       Define 11 f-values corresponding to x(i).
;
;         IDL> f = [ 0.200000, 1.30973, 1.30524, 1.74339, 2.07490, 2.45600, $
;         IDL>       2.84299,  3.50730, 3.18194, 2.36302, 0.231964 ]
;
;       Compute the integral:
```

```
;
;       IDL> result = integral( x, f )
;       IDL> HELP, result
;       RESULT          DOUBLE    =       1.6274544
;
;     In this example, the f-values are generated from a known function,
;     (f = .2 + 25*x - 200*x^2 + 675*x^3 - 900*x^4 + 400*x^5)
;
;     The Multiple Application Trapezoid Method yields;  result = 1.5648
;     The Multiple Application Simpson's Method yields;  result = 1.6036
;          IDL User Library INT_TABULATED.PRO yields;  result = 1.6232
;                           INTEGRAL.PRO yields;  result = 1.6274
;       The Exact Solution (4 decimal accuracy) yields;  result = 1.6405
```

paulv

--
Paul van Delst
CIMSS @ NOAA/NCEP/EMC

Subject: Re: How to calculate the curve area?
Posted by Julio[1] on Tue, 21 Jun 2005 21:23:40 GMT
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Now I'm using int_tabulated.pro (from IDL library). It's working
fine...

Best Regards!
Julio
