Subject: Re: How to handle gaps in plot?
Posted by Paul Van Delst[1] on Thu, 11 Aug 2005 15:14:40 GMT

caitouer wrote:
> Hi, everyone,
> I have a question about gaps in data array. Normally when there are
> gaps in data array, people would fill the gap with extraordinary large
> or small number. Then when you use plot, IDL will detect gap
> automatically and will not connect two intervals when data is
> available. However, sometimes the data format is not so friendly. For
> example, the data file is not filled with extraordinary large or small
> number. You do not know when you have gap and how large the gap is.
> Even worse, the time is irregular. Is there a easy way to plot the
> valid data only?

Well, it's easy to find the valid data, e.g. for given MIN_VALUE and MAX_VALUE parameters for your
dependent data,

```
Idx = WHERE( YData GT MIN_VALUE AND YData LT MAX_VALUE, Count )
IF ( Count GT 0 ) THEN $
  PLOT, XData[Idx], YData[Idx] $
ELSE $
  MESSAGE, 'No valid data!'
```

Is this the sort of thing you mean?

paulv

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

Subject: Re: How to handle gaps in plot?
Posted by caitouer on Thu, 11 Aug 2005 16:06:49 GMT

Thanks for your quick reply. It is true that it is easy when you have
filled the gap with some values. However, I am trying to figure out
how to plot when you do not fill the gap. Here is an example:

X (time):[1,2,3,5,6,7,10,11,12,19,20,21,22,23,24]
        ;Hourly data in one day. There are several gaps in the data
        ;array. You do not know when you will have gap nor
        ; how large the gap is. The actual data is not so regular and
        ;huge. So it is not practical to fill the data.

Y (some values):
 [1.1,0.9,1.3,1.6,2.1,0.7,2.3,0.1,0.3,0.6,0.9,1.4,1.3,1.7,1.8]
       ; these are the measurements you take at above time.

Then when you type:
plot,x,y
There will have lines between the intervals. However, these lines are
meaningless.

I just want know if we plot the valid intervals only without those
extra lines.

Thanks,
Caitouer

Subject: Re: How to handle gaps in plot?
Posted by Paul Van Delst[1] on Thu, 11 Aug 2005 16:40:59 GMT
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caitouer wrote:
> Thanks for your quick reply. It is true that it is easy when you have
> filled the gap with some values. However, I am trying to figure out
> how to plot when you do not fill the gap. Here is an example:
>
> X (time):[1,2,3,5,6,7,10,11,12,19,20,21,22,23,24]
>   ;Hourly data in one day. There are several gaps in the data
>   ;array. You do not know when you will have gap nor
>   ; how large the gap is. The actual data is not so regular and
>   ;huge. So it is not practical to fill the data.
>
> Y (some values):
> [1.1,0.9,1.3,1.6,2.1,0.7,2.3,0.1,0.3,0.6,0.9,1.4,1.3,1.7,1.8]
>   ; these are the measurements you take at above time.
>
> Then when you type:
> plot,x,y
> There will have lines between the intervals. However, these lines are
> meaningless.
>
> I just want know if we plot the valid intervals only without those
> extra lines.

Ahh... so you don't actually have invalid data in these gaps, just irregularly spaced data. The
simplest solution is to use the PSYM keyword to plot just symbols and no connecting lines at all
(since the lines between the regular, hourly data are also meaningless... at least depending on the

variabiliy of your data).

Another option would be to create a regularly spaced array of x-data (based on yout x(time) data),

copy in the y-data to a simialrly spaced array and fill the y-data gaps with !values.d_nan. E.g.

```
IDL> x=dindgen(20)
IDL> y=dindgen(20)
IDL> y[5:8]=!values.d_nan
IDL> plot, x, y
```

Insty-gap in the data plot.

paulv

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

___

Subject: Re: How to handle gaps in plot?
Posted by peter.albert@gmx.de on Fri, 12 Aug 2005 06:13:35 GMT
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Hi,

if you know a priori what the "good" interval should be, i.e. a
threshhold for intervals between x values that marks gaps, you could
identify those gaps and plot from one gap to the other using, please
forgive me, evil for loops.

In your example, this threshhold would be 1 (hour), and the example
code would look like this:

```
IDL> interval = 1
IDL> x=[1,2,3,5,6,7,10,11,12,19,20,21,22,23,24]
IDL> y=  [1.1,0.9,1.3,1.6,2.1,0.7,2.3,0.1,0.3,0.6,0.9,1.4,1.3,1.7,1.8 ]
IDL> gap=[-1,where(shift(x, -1)-x ne interval, n)]
IDL> plot, x, y, /nodata
IDL> for i=0,n-1 do oplot, x[gap[i]+1:gap[i+1]], y[gap[i]+1:gap[i+1]],
psym=-4
```

with the "shift" and "where" command I am checking where the interval
between adjacent x values exceeds the threshhold. The values in the
variable gap always give the last index of one connected x interval, so
in the following oplot command I am plotting from gap[i]+1 to gap[i+1].
Therefore we need the -1 as the first element in gap.

Best regards,

   Peter

Subject: Re: How to handle gaps in plot?
Posted by Craig Markwardt on Sat, 13 Aug 2005 04:16:40 GMT

"caitouer" <caitouer@yahoo.com> writes:
> Thanks for your quick reply. It is true that it is easy when you have
> filled the gap with some values. However, I am trying to figure out
> how to plot when you do not fill the gap. Here is an example:
>
> X (time):[1,2,3,5,6,7,10,11,12,19,20,21,22,23,24]
>   ;Hourly data in one day. There are several gaps in the data
>   ;array. You do not know when you will have gap nor
>   ; how large the gap is. The actual data is not so regular and
>   ;huge. So it is not practical to fill the data.
>
> Y (some values):
>   [1.1,0.9,1.3,1.6,2.1,0.7,2.3,0.1,0.3,0.6,0.9,1.4,1.3,1.7,1.8]
>   ; these are the measurements you take at above time.
>
> Then when you type:
> plot,x,y
> There will have lines between the intervals. However, these lines are
> meaningless.

I have a routine called GTISEG which groups data points into segments.
With that routine, it is up to you to decide how big of a time
separation is a gap.

Once you have the time segments, you can do a FOR loop and plot each
segment separately, i.e. use WHERE to find the points in each segment,
and then OPLOT those points onto your graph.

Craig

GTISEG can be found here:
  http://cow.physics.wisc.edu/~craigm/idl/arrays.html

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Craig B. Markwardt, Ph.D.   EMAIL: craigmnet@REMOVEcow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
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Subject: Re: How to handle gaps in plot?
Posted by caitouer on Mon, 22 Aug 2005 19:20:44 GMT
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Sorry to reply late. :)
Thanks, Craig. This is exactly what I need. Originally I calculated the time step one element by one element and also check if this gap is larger than the interval I set. It takes forever to plot. The GTISEG routine saves me a lot of computer time.
However, if we just want to plot the valid data, I agree with Peter and Paul. We can use PSM to plot out those valid data only.
Thank all of you again to help me to figure this problem out.
Caitouer