Subject: Re: Large File Plotting
Posted by davidf on Thu, 28 Sep 2000 07:00:00 GMT
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Pavel Romashkin (promashkin@cmdl.noaa.gov) writes:

>> What is needed is
>> something that can detect file size and
>> only display to the pixel resolution of the
>> screen.
>
> I think this is exactly what you need. At 1024 x 768, a monitor is
> capable of producing not better than 85 points per inch. Resample your
> large array to the desired resolution and plot it. PLOT will do this
> anyway (on a visual level), but a lot less efficiently.
>
> If the axis you plot against is 5" long, then the maximum number of
> points you'll be able to see is < 500. Use CONGRID for plotting:
>
> plot, congrid(a, 500)
>
> works very fast.

Another suggestion along this line is to use the NSUM
keyword on the PLOT command. This indicates how many
adjacent points IDL is to average in order to reduce
the number of plotted points.

If you are in to widget programming, I think you
should also be able to write something along the
lines of ZPLOT on my web page that allows you to
"zoom" into your data at different "resolutions".
Some combination of resampling the actual data
points and restricting the independent data range
should work. I don't think this would be too hard
to write.

Cheers,

David
--
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Coyote's Guide to IDL Programming: http://www.dfanning.com/
Toll-Free IDL Book Orders: 1-888-461-0155

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Posted by promashkin on Thu, 28 Sep 2000 07:00:00 GMT
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Cheers,
Pavel

Subject: Re: Large File Plotting
Posted by Mark Hadfield on Thu, 28 Sep 2000 20:52:11 GMT
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"Mark Przeslawski" <MarkPrzeslawski@ncodeinc.com> wrote in message news:st78offfa3gm3b@corp.supernews.com...
> Does anyone have an example of plotting
> very large time history data files. I tried
> creating a 1 million point file and it plotted
> okay. I tried a 10 million point file with
> various plotting routines and it hung my
> Windows 2000 machine (PIII, 700MHz,
> 256Mb RAM). I tried plot, live_plot,
> and some of the coyote plotting
> routines to no avail.

That's interesting. On my machine (not too different from yours: NT 4.0, PII, 400 MHZ, 256 MB RAM) I find that if I can create the array I can plot it:

IDL> plot, findgen(1000000)
IDL> plot, findgen(10000000)
IDL> plot, findgen(20000000)
IDL> plot, findgen(50000000)

% Unable to allocate memory: to make array.
% Execution halted at: $MAIN$

Of course, speed is an issue: about 3 s per million floating-point values on my machine.

> ... What is needed is
> something that can detect file size and
> only display to the pixel resolution of the
> screen.

That's pretty much what the Direct Graphics plotting commands do. They just write pixels to the screen as they go; they don't keep a copy of the data or the plotting primitives. This is why IDL Direct Graphics is so good for plotting really large datasets, and why it is so frustratingly limited in some ways.

When plotting such large datasets you should avoid Object Graphics (including LIVE_PLOT) and also Direct Graphics wrapper systems (like David's XWINDOW) that copy the data. You will also need to be careful about processing the data to avoid redundant copies, e.g. this generates two 10000000-element arrays

```
a = findgen(10000000)
b = a
```

but this generates only one

```
a = findgen(10000000)
b = temporary(a)
```

People other than me are more competent to advise you on handling large datasets.

Mark Hadfield
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