Subject: Re: correct way to use INTERPOLATE function
Posted by David Fanning on Fri, 21 Sep 2007 18:42:52 GMT
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Ryan. writes:

> I want to plot two arrays of different sizes so I am trying to use
> INTERPOLATE on the smaller array to make it the same size as the large
> one. I can't seem to use the INTERPOLATE function correctly and there
> isn't very much documentation on how to generalize it's use. I need
> help in generalizing its use. All I get as a result is the first
> element repeated (the same result I would get if I used the REPLICATE
> function). I want to do this in the general case because I need to do
> it a few times. Here is a simpler version of what I am doing:
>
> smallarray = [10.3, 9.6, 9.2, 8.5, 7.7, 6.9, 5.8, 5.4, 4.7, 4.1]
> largearray = FINDGEN(1000)*0.5
>
> smsize = N_ELEMENTS(smallarray)
> lasize = N_ELEMENTS(largearray)
>
> interpped = INTERPOLATE(smallarray, smsize/(lasize-1)*FINDGEN(lasize))
>
> PLOT, interpped, largearray
>
> One feature of the small array is that it is decreasing throughout and
> has approximately 100 elements. The large array has several thousand
> elements. I believe there is an error in the equation I have in the
> second argument.

It's not clear to me exactly what you are hoping to do,
but it seems clear INTERPOLATE isn't the way to do it. :-)

I think something like this will work:

```
PLOT, Congrid(smallarray, N_Elements(largearray)), largearray
```

This will not change the values in smallarray that get plotted.
If you want to interpolate the values, set the INTERP keyword
to CONGRID.

Cheers,

David
--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Sepore ma de ni thui. ("Perhaps thou speakest truth.")

---

Subject: Re: correct way to use INTERPOLATE function
Posted by rchughes on Fri, 21 Sep 2007 19:24:05 GMT
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> PLOT, Congrid(smallarray, N_Elements(largearray)), largearray

If I do that I get the same result:
PLOT, CONGRID(smallarray, N_ELEMENTS(largearray), 1, 1) <- With our
without the INTERP keyword

I want to *stretch* the small array so that it has the same number of
elements as the large one so I can plot it and all the new points to
be interpolated linearly between each point. Evenly spaced points is
fine for my purposes.

Ryan.

---

Subject: Re: correct way to use INTERPOLATE function
Posted by David Fanning on Fri, 21 Sep 2007 19:30:45 GMT
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Ryan. writes:

> If I do that I get the same result:
> PLOT, CONGRID(smallarray, N_ELEMENTS(largearray), 1, 1) <- With our
> without the INTERP keyword

The INTERP keyword will be set like this:

Plot, Congrid(sm, N_Elements(large), /INTERP)

Or, like this:

Plot, Congrid(sm, N_Elements(large), INTERP=1)

Cheers,

David
--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Sepore ma de ni thui. ("Perhaps thou speakest truth.")

---

Subject: Re: correct way to use INTERPOLATE function
Posted by rchughes on Fri, 21 Sep 2007 19:37:57 GMT
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> The INTERP keyword will be set like this:
>
> Plot, Congrid(sm, N_Elements(large), /INTERP)
>
> Or, like this:
>
> Plot, Congrid(sm, N_Elements(large), INTERP=1)

I'm aware of how to set it. I guess my comment wasn't too clear. I meant to say that I get the same result whether I use the INTERP keyword or not.

Does your statement work as it is? If I use the statement like you wrote it, it asks me for additional arguments (Error: % Variable is undefined: Y. % Error occurred at: CONGRID 135). Therefore I need to add the Y and Z arguments which I just put values of 1.

Ryan.

---

Subject: Re: correct way to use INTERPOLATE function
Posted by David Fanning on Fri, 21 Sep 2007 19:51:28 GMT
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Ryan. writes:

> I'm aware of how to set it. I guess my comment wasn't too clear. I
> meant to say that I get the same result whether I use the INTERP
> keyword or not.
>
> Does your statement work as it is?

No, this is pseudocode. :-)

Try this:

```
s = [10.3, 9.6, 9.2, 8.5, 7.7, 6.9, 5.8, 5.4, 4.7, 4.1]
l = Findgen(100) * 0.5
P.MULTI=[0,1,2]
Window
Plot, Congrid(s, N_Elements(l))
Plot, Congrid(s, N_Elements(l), /INTERP)
!P.MULTI=0
```

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Sepore ma de ni thui. ("Perhaps thou speakest truth.")

---

Subject: Re: correct way to use INTERPOLATE function
Posted by pgrigis on Fri, 21 Sep 2007 20:26:10 GMT
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Ryan. wrote:
>> PLOT, Congrid(smallarray, N_Elements(largearray)), largearray
>
> If I do that I get the same result:
> PLOT, CONGRID(smallarray, N_ELEMENTS(largearray), 1, 1) <- With our
> without the INTERP keyword
>
> I want to *stretch* the small array so that it has the same number of
> elements as the large one so I can plot it and all the new points to
> be interpolated linearly between each point. Evenly spaced points is
> fine for my purposes.

For that purpose, you can also use INTERPOL (rather than INTERPOLATE).
Here's an example:

```
x=findgen(6)/5
y=[0.,2,2,5,6,10]

;first data set
plot,x,y,psym=-6

x2=findgen(100)/100
z=interpol(y,x,x2)
;the z array is interpolated linearly from the point in y

oplot,x2,z,psym=-4
```

Is that waht you are trying to do?

Cheers,
Paolo

PS: switching to google groups as it turns out newsgroup server

are not supported at my new institution... at least the RSS feed
can be shown in thunderbird in such a way as to look kind of
similar as it should when using a real newsgroup server... but
I am wondering whether there is a way of using a fixed size font
in the google groups "post message" interface...

>
> Ryan.

---

Subject: Re: correct way to use INTERPOLATE function
Posted by David Fanning on Fri, 21 Sep 2007 20:49:19 GMT
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pgrigis@gmail.com writes:

> For that purpose, you can also use INTERPOL (rather than INTERPOLATE).
> Here's an example:
>
> x=findgen(6)/5
> y=[0.,2,2,5,6,10]
>
> ;first data set
> plot,x,y,psym=-6
>
> x2=findgen(100)/100
> z=interpol(y,x,x2)
> ;the z array is interpolated linearly from the point in y
>
> oplot,x2,z,psym=-4
>
> Is that waht you are trying to do?

Ah, interesting. After some playing around with CONGRID
keywords, I discovered that this interpolation method
is virtually identical to this:

```
nelem = N_Elements(x2)
OPLOT, x2, CONGRID(y, nelem, /INTERP, /MINUS_ONE)
```

Could be an interesting article in here somewhere. :-)

Cheers,

David

--
David Fanning, Ph.D.
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---

Subject: Re: correct way to use INTERPOLATE function
Posted by rchughes on Fri, 21 Sep 2007 21:06:13 GMT
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> Is that waht you are trying to do?

Thanks Paolo and David. That's not what I wanted to do but it did
help me out to produce the plot I want. I want to create a smallarray
vs. largearray plot but If I just tried to plot it, IDL will do what
it does best and plot only the first N_ELEMENTS(smallarray) points.
The code that I did come up with is as follows (It is very close to
what Paolo had):

```
l = FINDGEN(100)*0.5
s = [10.3, 9.6, 9.2, 8.5, 7.7, 6.9, 5.8, 5.4, 4.7, 4.1]
ns = N_ELEMENTS(s)
nl = N_ELEMENTS(l)

x = FINDGEN(ns)/(ns-1)
x2 = FINDGEN(nl)/nl

z = INTERPOL(s, x, x2)

PLOT, z, l, PSYM=-6
```

Thanks for your help,
Ryan.

---

Subject: Re: correct way to use INTERPOLATE function
Posted by R.G.Stockwell on Fri, 21 Sep 2007 21:16:37 GMT
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"Ryan." <rchughes@gmail.com> wrote in message
news:1190408773.723336.302670@o80g2000hse.googlegroups.com.. .
>> Is that waht you are trying to do?
>
> Thanks Paolo and David. That's not what I wanted to do but it did
> help me out to produce the plot I want. I want to create a smallarray

> vs. largearray plot but If I just tried to plot it, IDL will do what
> it does best and plot only the first N_ELEMENTS(smallarray) points.
> The code that I did come up with is as follows (It is very close to
> what Paolo had):
>
> l = FINDGEN(100)*0.5
> s = [10.3, 9.6, 9.2, 8.5, 7.7, 6.9, 5.8, 5.4, 4.7, 4.1]
> ns = N_ELEMENTS(s)
> nl = N_ELEMENTS(l)
>
> x = FINDGEN(ns)/(ns-1)
> x2 = FINDGEN(nl)/nl
>
> z = INTERPOL(s, x, x2)
>
> PLOT, z, l, PSYM=-6

Hi Ryan,

I took a quick glance, and for the life of me i can't figure out
what it is that you really want to do. You are plotting the
"l" array here as a function of your "z" (which is
based on your original "s"). I don't think that means
anything.

I assume you have a watered down example of your
original problem, but it just seems like
1) you have it backwards (i.e. you want to plot
> plot l,z

and 2)
you probably shouldn't be doing that in the first place.

My point would be that the elements of "s" should have some
ordinate related to them. Select the proper ordinate to pair with
the "s"es and just plot that.

Or if you need to interpolate, then interpolate both in the exact
same way.

Cheers,
bob

---

Subject: Re: correct way to use INTERPOLATE function
Posted by pgrigis on Fri, 21 Sep 2007 21:35:31 GMT

R.G. Stockwell wrote:
> "Ryan." <rchughes@gmail.com> wrote in message
> news:1190408773.723336.302670@o80g2000hse.googlegroups.com.. .
>>> Is that waht you are trying to do?
>>
>> Thanks Paolo and David. That's not what I wanted to do but it did
>> help me out to produce the plot I want. I want to create a smallarray
>> vs. largearray plot but If I just tried to plot it, IDL will do what
>> it does best and plot only the first N_ELEMENTS(smallarray) points.
>> The code that I did come up with is as follows (It is very close to
>> what Paolo had):
>>
>> l = FINDGEN(100)*0.5
>> s = [10.3, 9.6, 9.2, 8.5, 7.7, 6.9, 5.8, 5.4, 4.7, 4.1]
>> ns = N_ELEMENTS(s)
>> nl = N_ELEMENTS(l)
>>
>> x = FINDGEN(ns)/(ns-1)
>> x2 = FINDGEN(nl)/nl
>>
>> z = INTERPOL(s, x, x2)
>>
>> PLOT, z, l, PSYM=-6
>
>
> Hi Ryan,
>
> I took a quick glance, and for the life of me i can't figure out
> what it is that you really want to do. You are plotting the
> "l" array here as a function of your "z" (which is
> based on your original "s"). I don't think that means
> anything.

Maybe I know what's happening here...

Let's assume you have a low-resolution circle
given by x1 and y1 coordinates:

```
n=10
t1=findgen(n)/(n-1)*!Pi*2
x1=sin(t1)
y1=cos(t1)
```

and a high resolution circle given by x2 and y2

```
n=64
t2=findgen(n)/(n-1)*!Pi*2
```

x2=sin(t2)
y2=cos(t2)

Then, assume that for some reason you have
access to x1 and to y2 and not to x2, and you
want to try to plot the best possible approximation
of the high-res circle. Then one may need to
do something like:

xx2=interpol(x1,t1,t2)

and plotting (xx2,y2) is an approximation
to the circle (of course, in such a case,
use of the /spline keyword to interpol may
make the plot nicer).

So, this may be something along the line
of what the OP is doing...

Ciao,
Paolo

>
> I assume you have a watered down example of your
> original problem, but it just seems like
> 1) you have it backwards (i.e. you want to plot
>> plot l,z
>
> and 2)
> you probably shouldn't be doing that in the first place.
>
> My point would be that the elements of "s" should have some
> ordinate related to them. Select the proper ordinate to pair with
> the "s"es and just plot that.
>
> Or if you need to interpolate, then interpolate both in the exact
> same way.
>
> Cheers,
> bob

Subject: Re: correct way to use INTERPOLATE function
Posted by rchughes on Fri, 21 Sep 2007 21:50:12 GMT
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> you probably shouldn't be doing that in the first place.

Hi Bob,

I was actually looking over the validity of what I was doing after I posted it. I wasn't certain that what I was doing correctly represented what I wanted. Thanks for confirming my thoughts. I got sidetracked on what I originally wanted to show. I got busy trying to debug my code and ended up doing something I shouldn't. I got sidetracked with IDL repeatedly crashing out on me because I was unintentionally Interpolating a string (Not a good idea, by the way) and spent much time on this. Then I got busy trying to get the INTERPOLATE or CONGRID functions to work properly. I will rethink my original intentions and hopefully stay on track this time. =)

Thanks for pointing it out,
Ryan.

---

Subject: Re: correct way to use INTERPOLATE function
Posted by R.G.Stockwell on Fri, 21 Sep 2007 21:59:30 GMT
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"Ryan." <rchughes@gmail.com> wrote in message
news:1190411412.834849.94160@g4g2000hsf.googlegroups.com...
>> you probably shouldn't be doing that in the first place.
>
> Hi Bob,
>
> I was actually looking over the validity of what I was doing after I
> posted it. I wasn't certain that what I was doing correctly
> represented what I wanted. Thanks for confirming my thoughts. I got
> sidetracked on what I originally wanted to show. I got busy trying to
> debug my code and ended up doing something I shouldn't. I got
> sidetracked with IDL repeatedly crashing out on me because I was
> unintentionally Interpolating a string (Not a good idea, by the way)
> and spent much time on this. Then I got busy trying to get the
> INTERPOLATE or CONGRID functions to work properly. I will rethink my
> original intentions and hopefully stay on track this time. =)
>
> Thanks for pointing it out,
> Ryan.

You are welcome.

I don't mean to overstate the "shouldn't do it" part. Interpolation is common and usually a fine thing to do.
The part that stood out for me was taking the original array with 10 elements and no x-values related to those 10 elements. That is fine, because most people use the index number as the x-coordinate of the data. So you have x = 0,1,2...9.

Then the example is "interpolating" the original data "s" onto an array "l" that goes from 0 to 49.5. That is outside the bounds of the original index (the 0,1,..9) so it doesn't make sense.

If you interpolated onto a finer scale than the integer index, (from 0,1,2...9 to a new x-value array of 0,0.1,0.2,0.3..... 9.0 then that would be fine). That's all I was really getting at.

Cheers,
bob

PS interpolating strings should be able to work
for instance
x = 'liberal'
x2='conservative'
z = interpol([x,x2], 0.5)
print, result
> moderate
sorry, dumb attempt at a joke

---

Subject: Re: correct way to use INTERPOLATE function
Posted by David Fanning on Fri, 21 Sep 2007 22:45:16 GMT
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Ryan. writes:

> I was actually looking over the validity of what I was doing after I
> posted it. I wasn't certain that what I was doing correctly
> represented what I wanted. Thanks for confirming my thoughts. I got
> sidetracked on what I originally wanted to show. I got busy trying to
> debug my code and ended up doing something I shouldn't. I got
> sidetracked with IDL repeatedly crashing out on me because I was
> unintentionally Interpolating a string (Not a good idea, by the way)
> and spent much time on this. Then I got busy trying to get the
> INTERPOLATE or CONGRID functions to work properly. I will rethink my
> original intentions and hopefully stay on track this time. =)

I experience the same problem when I try to write IDL programs

with the EMACS editor. :-)

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/
Sepore ma de ni thui. ("Perhaps thou speakest truth.")

---