Subject: Re: HISTOGRAM, binsize, and max
Posted by penteado on Wed, 18 May 2011 14:16:13 GMT
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On May 18, 11:05 am, andry <andry_will...@hotmail.com> wrote:
> My main concern is the number of elements returned by the function.
> The only difference between the 2 command is that I multiplied the
> binsize and max with 100. BUT they return 7 and 8 elements?
>
> I would expect they both return the same number of elements.

http://www.idlcoyote.com/math_tips/razoredge.html

Subject: Re: HISTOGRAM, binsize, and max
Posted by David Fanning on Wed, 18 May 2011 14:23:25 GMT
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andry writes:

> Can somebody explain why the following gives different number of
> elements with the HISTOGRAM function?
>
> IDL> hist_spd= HISTOGRAM(velocity[indb],binsize= .20,min=0.,max=1.40)
> IDL> print,hist_spd
> 6 16 23 0 0
> 0 0
> IDL> hist_spd= HISTOGRAM(velocity[indb],binsize= 20.,min=0.,max=140.)
> IDL> print,hist_spd
> 45 0 0 0 0
> 0 0 0
>
> (whatever velocity content is)
> My main concern is the number of elements returned by the function.
> The only difference between the 2 command is that I multiplied the
> binsize and max with 100. BUT they return 7 and 8 elements?
>
> I would expect they both return the same number of elements.

People expect a lot of things from computers, but the
computers don't always oblige. I think this is just the normal
weirdness with how computers represent numbers. It
turns out this is different from how humans apparently
do it. :-)

http://www.idlcoyote.com/math_tips/sky_is_falling.html
http://www.idlcoyote.com/math_tips/razoredge.html

Cheers,

David

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

Subject: Re: HISTOGRAM, binsize, and max
Posted by pgrigis on Wed, 18 May 2011 15:22:48 GMT
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On May 18, 10:23 am, David Fanning <n...@idlcoyote.com> wrote:
> andry writes:
>> Can somebody explain why the following gives different number of
>> elements with the HISTOGRAM function?
>
>> IDL> hist_spd= HISTOGRAM(velocity[indb],binsize= .20,min=0.,max=1.40)
>> IDL> print,hist_spd
>> 6 16 23 0 0
>> 0 0
>> IDL> hist_spd= HISTOGRAM(velocity[indb],binsize= 20.,min=0.,max=140.)
>> IDL> print,hist_spd
>> 45 0 0 0 0
>> 0 0 0
>
>> (whatever velocity content is)
>> My main concern is the number of elements returned by the function.
>> The only difference between the 2 command is that I multiplied the
>> binsize and max with 100. BUT they return 7 and 8 elements?
>
>> I would expect they both return the same number of elements.
>
> People expect a lot of things from computers, but the
> computers don't always oblige. I think this is just the normal
> weirdness with how computers represent numbers. It
> turns out this is different from how humans apparently
> do it. :-)
>
> http://www.idlcoyote.com/math_tips/sky_is_falling.html
> http://www.idlcoyote.com/math_tips/razoredge.html

When I try that I always get 8 bins no matter what.

I don't see how you could get 7 bins in that situation...

IDL> hist_spd= HISTOGRAM(randomn(seed,10)*200,binsize= .
20,min=0.,max=1.40) & help,hist_spd
HIST_SPD   LONG   = Array[8]

IDL> hist_spd= HISTOGRAM(randomn(seed,10)*200,binsize=
20.0,min=0.,max=140.0) & help,hist_spd
HIST_SPD   LONG   = Array[8]

Ciao,
Paolo

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

Subject: Re: HISTOGRAM, binsize, and max
Posted by war on Wed, 18 May 2011 17:08:53 GMT

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Hi Paolo,

I guess this has to do with the fact that different computers don't
behave the same way. What OS and which version of IDL are you with?

Mine is actually a
{ x86 linux unix linux 8.0 Jun 18 2010   32   64}

> When I try that I always get 8 bins no matter what.
> I don't see how you could get 7 bins in that situation...
>
> IDL> hist_spd= HISTOGRAM(randomn(seed,10)*200,binsize= .
> 20,min=0.,max=1.40) & help,hist_spd

> HIST_SPD LONG = Array[8]
>
> IDL> hist_spd= HISTOGRAM(randomn(seed,10)*200,binsize=
> 20.0,min=0.,max=140.0) & help,hist_spd
> HIST_SPD LONG = Array[8]
>
> Ciao,
> Paolo
>
>
>
>> Cheers,
>
>> David
>
>> --
>> David Fanning, Ph.D.
>> Fanning Software Consulting, Inc.
>> Coyote's Guide to IDL Programming:http://www.idlcoyote.com/
>> Sepore ma de ni thui. ("Perhaps thou speakest truth.")
>
>

Subject: Re: HISTOGRAM, binsize, and max
Posted by pgrigis on Wed, 18 May 2011 18:33:08 GMT
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On May 18, 1:08 pm, andry <andry_will...@hotmail.com> wrote:
> Hi Paolo,
>
> I guess this has to do with the fact that different computers don't
> behave the same way. What OS and which version of IDL are you with?
>
> Mine is actually a
> { x86 linux unix linux 8.0 Jun 18 2010 32 64}

Maybe you have conversion to doubles enabled by default?

With floats you always get 7+1 bins:

```
IDL> print,1.4/0.2,format='(f20.15)'
   7.000000000000000
IDL> print,140.0/20.0,format='(f20.15)'
   7.000000000000000
```

With doubles you will get different numbers of bins:

IDL> print,1.4d/0.2d,format='(f20.15)'
  6.999999999999999
IDL> print,140d/20d,format='(f20.15)'
  7.000000000000000

Ciao,
Paolo

>
>
>
>
>
>
>
>> When I try that I always get 8 bins no matter what.
>> I don't see how you could get 7 bins in that situation...
>
>> IDL> hist_spd= HISTOGRAM(randomn(seed,10)*200,binsize= .
>> 20,min=0.,max=1.40) & help,hist_spd
>> HIST_SPD LONG = Array[8]
>
>> IDL> hist_spd= HISTOGRAM(randomn(seed,10)*200,binsize=
>> 20.0,min=0.,max=140.0) & help,hist_spd
>> HIST_SPD LONG = Array[8]
>
>> Ciao,
>> Paolo
>
>>> Cheers,
>
>>> David
>
>>> --
>>> David Fanning, Ph.D.
>>> Fanning Software Consulting, Inc.
>>> Coyote's Guide to IDL Programming:http://www.idlcoyote.com/
>>> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: HISTOGRAM, binsize, and max
Posted by pgrigis on Wed, 18 May 2011 18:41:25 GMT
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On May 18, 2:33 pm, Paolo <pgri...@gmail.com> wrote:

> On May 18, 1:08 pm, andry <andry_will...@hotmail.com> wrote:
>
>> Hi Paolo,
>
>> I guess this has to do with the fact that different computers don't
>> behave the same way. What OS and which version of IDL are you with?
>
>> Mine is actually a
>> { x86 linux unix linux 8.0 Jun 18 2010 32 64}
>
> Maybe you have conversion to doubles enabled by default?
>
> With floats you always get 7+1 bins:
>
> IDL> print,1.4/0.2,format='(f20.15)'
> 7.000000000000000
> IDL> print,140.0/20.0,format='(f20.15)'
> 7.000000000000000
>
> With doubles you will get different numbers of bins:
>
> IDL> print,1.4d/0.2d,format='(f20.15)'
> 6.999999999999999
> IDL> print,140d/20d,format='(f20.15)'
> 7.000000000000000
>
> Ciao,
> Paolo
>
>
>
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>
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>
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>
>
>>> When I try that I always get 8 bins no matter what.
>>> I don't see how you could get 7 bins in that situation...
>
>>> IDL> hist_spd= HISTOGRAM(randomn(seed,10)*200,binsize= .
>>> 20,min=0.,max=1.40) & help,hist_spd
>>> HIST_SPD LONG = Array[8]
>
>>> IDL> hist_spd= HISTOGRAM(randomn(seed,10)*200,binsize=
>>> 20.0,min=0.,max=140.0) & help,hist_spd
>>> HIST_SPD LONG = Array[8]

to clarify:

```
IDL> hist_spd= HISTOGRAM(float(randomn(seed,
10)*200),binsize=20.0,min=0.0,max=140.0) & help,hist_spd
HIST_SPD        LONG      = Array[8]
IDL> hist_spd= HISTOGRAM(double(randomn(seed,
10)*200),binsize=20d,min=0d,max=140d) & help,hist_spd
HIST_SPD        LONG      = Array[8]
IDL> hist_spd= HISTOGRAM(float(randomn(seed,10)*200),binsize=.
20,min=0.,max=1.40) & help,hist_spd
HIST_SPD        LONG      = Array[8]
IDL> hist_spd= HISTOGRAM(double(randomn(seed,10)*200),binsize=.
20d,min=0.d,max=1.40d) & help,hist_spd
HIST_SPD        LONG      = Array[7]
```

Float is consistent, double not.
The reason seems to be the different value you get when dividing
max-min by binsize, caused by the well known issues with floating
representation of numbers.

Ciao,
Paolo

```
>
>>>  Ciao,
>>>  Paolo
>
>>>>  Cheers,
>
>>>>  David
>
>>>>  --
>>>>  David Fanning, Ph.D.
>>>>  Fanning Software Consulting, Inc.
>>>>  Coyote's Guide to IDL Programming:http://www.idlcoyote.com/
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```