
Subject: Re: HISTOGRAM and the Razor's Edge.
Posted by [Craig Markwardt](#) on Thu, 12 Jun 2003 07:04:28 GMT
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timrobshaw@yahoo.com (Tim Robshaw) writes:

```
...
> IDL> print, histogram([-5.50,-5.45,-5.40,-5.35,-5.30,-5.25],min=-5.50,bin size=0.05)
>      1      2      0      2      0      1
>
> Wait a minute, this should be a uniform distribution!
...
>
> Well, there ya go. It's a roundoff error problem that results from
> trying to balance the values on a razor's edge... the subtraction and
> division knock a few values off balance. But, the result is still
> WRONG and I just don't know enough about roundoff error to know if
> this is an insurmountable problem (but my educated guess is: yes.) Is
> there some clever way to make HISTOGRAM behave properly in such
> situations?
```

Partial solution number one: use double precision.

Partial solution number two: multiply all values by $(1+EPS)$
where $EPS = (MACHAR()).EPS$ (or equivalent double version)
(assumes you always want to round "up" to the next bin)

Partial solution number three: add a random deviate to each value
(doesn't solve the razor's edge problem per se, but reduces the
chances that a human-entered quantity will land on a bin-edge, and
reduces the bias of always rounding "up" to the next bin)

Partial solution number four: work in powers of 2 instead of multiples
of 0.05.

Partial solution number five: learn to live with it.

Good luck!
Craig

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Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
