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Subject: Re: Inaccuracies

Posted by [Jackel](#) on Tue, 14 Nov 1995 08:00:00 GMT

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In article <30A7BC4D.7018@cdc.noaa.gov> Andy Loughe <afl@cdc.noaa.gov> writes:

> Ok, I am sure this has been discussed before, but let  
> me start this thread again. I wish to create a 15-element  
> vector which contains the numbers -1.4 to 1.4 by an increment  
> of 0.2 I also wish the sum of these elements to be zero  
> (No, this isn't the new math). Here is what I tried...

Well, this works:

```
a= (INDGEN(29) - 14) / 10.0d0
```

but that still doesn't address the fundamental problem. Start with

```
a= 7.0d0 * 0.2d0      which when PRINTed gives  1.4000000
```

then

```
b= a - 1.4000000d0    when PRINTed gives 2.2204460e-016
```

but

```
c= a  
b= a - c      gives 0.0
```

(note that c= 1.4000000d0, then b=a-c gives a non-zero result). So, it looks like the internal representation of 7.0d0\*0.2d0 is not quite 1.4, but for display purposes IDL does a bit of rounding (truncation?).

So, try

```
PRINT,a,FORMAT='(f27.25)'
```

and get

```
1.40000000000000001000000000
```

which has a 1d-16 difference. The rest of the puzzle is solved by PRINTing 1.4d0 (with the FORMATING as above):

```
1.39999999999999990000000000
```

Basically, it looks like a combination of the usual representation error, combined with a short default format for output.

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