Subject: Re: rounding
Posted by thompson on Wed, 04 Sep 2002 14:59:05 GMT
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Amar Nayegandhi <anayegan@csee.usf.edu> writes:

> Hi,
> IDL seems to round off large decimal numbers. For e.g.,
> IDL> x = 284.766117
> IDL> print, format='(I11)',x*1000000L
> 284766112

> IDL> x = 284.766119
> IDL> print, format='(I11)',x*1000000L
> 284766112

> Is there any way around this?

This isn't IDL, it's just the way binary computers work. To get around it, use double precision instead of single precision.

```
IDL> x = 284.766117d0
IDL> print, format='(I11)',x*1000000L
  284766117
```

Another way to look at what's going on is to print out the floating point numbers to high precision.

```
IDL> x = 284.766117
IDL> print, format='(F22.11)',x
      284.76611328125
IDL> x = 284.766117d0
IDL> print, format='(F22.11)',x
      284.76611700000
IDL> print, format='(F27.16)',x
      284.7661170000000100
```

It isn't that IDL rounds off the numbers, it's that some precision is lost in converting back and forth between the decimal notation that people use and the binary notation that computers use internally. Double precision numbers have the same problem, as shown above, only not so bad.

William Thompson