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Subject: Re: Specify the degree of accuracy of a floating point number  
Posted by [Brian Larsen](#) on Thu, 22 Feb 2007 20:43:44 GMT  
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David,

hmmm...

```
>
> IDL> a = 432.49584738273845D
> IDL> print, round_off(a, 0.0000001)
>     2.9991178
>
> Huh!? What did I do wrong?
```

This is what it does for me (and I do have datatype)

```
IDL> a = 432.49584738273845D
IDL> print, round_off(a, 0.0000001)
% Compiled module: ROUND_OFF.
    -214.74836
% Program caused arithmetic error: Floating illegal operand
IDL> print, round_off(a, 0.0000001d)
    -214.74836
% Program caused arithmetic error: Floating illegal operand
IDL> help, a
A      DOUBLE =    432.49585
IDL> print, round_off(a, 0.0001)
    432.49580
```

I think the answer is in the warning (% Program caused arithmetic error: Floating illegal operand)

look at this chunk of the code:

```
num = abs(num)
if acc lt 1.0 then begin
    factor = round(1.0/acc)
    x = long((num+0.5*acc)*factor)/double(factor)
endif else begin
    x = long((long((num+acc/2.)/acc))*acc)
endelse
;; and add in a help statement
HELP, x, acc
```

I then get:

```
IDL> a = 432.49584738273845D
IDL> print, round_off(a, 0.0000001)
X      DOUBLE =    -214.74836
```

```
ACC      FLOAT  = 1.00000e-07
-214.74836
% Program caused arithmetic error: Floating illegal operand
```

Is it something to do with dividing a long by a double??  
x = long((num+0.5\*acc)\*factor)/double(factor)

Or something to do with?  
[http://www.dfanning.com/math\\_tips/sky\\_is\\_falling.html](http://www.dfanning.com/math_tips/sky_is_falling.html)

Odd that it works with smaller number of digits...

```
IDL> print, round_off(a, 0.000001)
X      DOUBLE  = 432.49585
ACC    FLOAT   = 1.00000e-06
432.49585
IDL> print, round_off(a, 0.0000001)
X      DOUBLE  = -214.74836
ACC    FLOAT   = 1.00000e-07
-214.74836
```

I bet you are in a better position to understand this than I am  
however...

Brian

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