Subject: CHECK_MATH and exp()
Posted by jeyadev on Mon, 26 Aug 2002 23:15:46 GMT
View Forum Message <> Reply to Message

Could someone please explain this:

```
WAVE> junk = check_math(1,0)
WAVE> print, junk
      0
WAVE> y = exp(-9.2^2)
WAVE> print, y, check_math(1,0)
  1.74307e-37           0
WAVE> y = exp(-9.3^2)
WAVE> print, y, check_math(1,0)
  2.74074e-38           0
WAVE> y = exp(-9.4^2)
% Program caused arithmetic error: Floating underflow
% Program caused arithmetic error: Floating illegal operand
WAVE> print, y, check_math(1,0)
  4.22418e-39           0
```

I first ran into the problem in a set of loops, and narrowed down the

```
% Program caused arithmetic error: Floating illegal operand
```

error to a call to the exp() function. A little fooling around resulted in getting to the above. It appears that when the argument reaches -9.4^2, the underflow occurs, but I cannot understand the "illegal operand". Also, why does CHECK_MATH() not catch the underflow.

And, now for more:

```
WAVE> .run
- for i=90,100 do begin
-   x = i/10.0
-   y = exp(-x^2)
-   print, x, y, check_math(1,0)
- endfor
- end
% Compiled module: $MAIN$.
      9.00000  6.63968e-36        128
      9.10000  1.08661e-36        128
      9.20000  1.74307e-37        128
      9.30000  2.74074e-38        128
% Program caused arithmetic error: Floating underflow
```

```
% Program caused arithmetic error: Floating illegal operand
      9.40000  4.22418e-39         160
% Program caused arithmetic error: Floating underflow
% Program caused arithmetic error: Floating illegal operand
      9.50000  6.38150e-40         160
% Program caused arithmetic error: Floating underflow
% Program caused arithmetic error: Floating illegal operand
      9.60000  9.44966e-41         160
% Program caused arithmetic error: Floating underflow
% Program caused arithmetic error: Floating illegal operand
      9.70000  1.37159e-41         160
% Program caused arithmetic error: Floating underflow
% Program caused arithmetic error: Floating illegal operand
      9.80000  1.95201e-42         160
% Program caused arithmetic error: Floating underflow
% Program caused arithmetic error: Floating illegal operand
      9.90000  2.71852e-43         160
% Program caused arithmetic error: Floating underflow
% Program caused arithmetic error: Floating illegal operand
      10.0000  3.78351e-44         160
```

Again, I can see the problem for x > 9.3. But, what is the CHECK_MATH() doing? First, it seems to say that there is an "floating point operand error", and then it is that *plus* and underflow. What is the "floating point operand error" that the code 128 is indicating?

I am running PV-WAVE CL Version 6.01 (sun4 solaris sparc) on a Sun Ultra 10 under Solaris 8.

thanks

--

Surendar Jeyadev jeyadev@wrc.xerox.bounceback.com

Remove 'bounceback' for email address