Subject: Re: Friday Afternoon Puzzler
Posted by pgrigis on Fri, 12 Jun 2009 21:07:38 GMT
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David Fanning wrote:
> Folks,
>
> If you've already had a beer, you may want to work
> on this one. Should we be concerned? Or is this just
> one more example for the Sky is Falling article?
> I've voiced my opinion, but it didn't satisfy the
> complainant. What say you?
>
> curly=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
> larry=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
> curly = curly*!PI/180.
> larry *= !PI/180.

I'd argue that you are multiplying curly bi pi and dividing the result
by 180
in the first line, and dividing pi by 180 first and multiplying larry
by the result
in the second line. Therefore, you are performing two different set of
floating
point operations, therefore I am not surprised they give slightly
different results.

Ciao,
Paolo

> diff=curly-larry
> print,diff
>
> curly=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
> larry=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
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> print,diff
>
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> curly *= !PI/180.
> larry *= !PI/180.
> diff=curly-larry
> print,diff
>
> The results:

>
> -3.72529e-009 0.000000 0.000000-9.31323e-010 0.000000
> 0.000000 0.000000
> 0.000000 0.000000 0.000000 0.000000 0.000000
> 0.000000 0.000000
> 0.000000 0.000000 0.000000 0.000000 0.000000
> 0.000000 0.000000
>
>
> Why aren't the first set of differences (where the assignment
> is made with the *= operator) *exactly* zero?
>
> Cheers,
>
> David
>
>
> --
> David Fanning, Ph.D.
> Fanning Software Consulting, Inc.
> Coyote's Guide to IDL Programming: http://www.dfanning.com/
> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Friday Afternoon Puzzler
Posted by Kenneth P. Bowman on Fri, 12 Jun 2009 21:09:09 GMT
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In article <MPG.249c6dccba4246d098a6e1@news.giganews.com>,
David Fanning <news@dfanning.com> wrote:

> Folks,
>
> If you've already had a beer, you may want to work
> on this one. Should we be concerned? Or is this just
> one more example for the Sky is Falling article?
> I've voiced my opinion, but it didn't satisfy the
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> curly = curly*!PI/180.
> larry *= !PI/180.
> diff=curly-larry
> print,diff
>
> Why aren't the first set of differences (where the assignment
> is made with the *= operator) *exactly* zero?

>
> Cheers,
>
> David

My guess is that the compiler/interpreter does the multiplication and division operations in a different order in the two statements in the first case. The other two cases are syntactically identical, so the operations should be carried out in the same order.

Why the operations are done in a different order is the meta-question.

Ken Bowman

Subject: Re: Friday Afternoon Puzzler
Posted by pgrigis on Fri, 12 Jun 2009 21:09:47 GMT
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Paolo wrote:
> David Fanning wrote:
>> Folks,
>>
>> If you've already had a beer, you may want to work
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> in the first line, and dividing pi by 180 first and multiplying larry
> by the result
> in the second line. Therefore, you are performing two different set of
> floating
> point operations, therefore I am not surprised they give slightly
> different results.

In other words, (a*b)/c is different than a*(b/c) with floats

Paolo

>
> Ciao,
> Paolo
>
>> diff=curly-larry
>> print,diff
>>
>> curly=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
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>> curly *= !PI/180.
>> larry *= !PI/180.
>> diff=curly-larry
>> print,diff
>>
>> The results:
>>
>> -3.72529e-009   0.000000   0.000000-9.31323e-010   0.000000
>> 0.000000   0.000000
>>   0.000000   0.000000   0.000000   0.000000   0.000000
>> 0.000000   0.000000
>>   0.000000   0.000000   0.000000   0.000000   0.000000
>> 0.000000   0.000000
>>
>>
>> Why aren't the first set of differences (where the assignment
>> is made with the *= operator) *exactly* zero?
>>
>> Cheers,
>>
>> David
>>
>>
>> --
>> David Fanning, Ph.D.
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>> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Friday Afternoon Puzzler

Paolo wrote:
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>> David Fanning wrote:
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>>>
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>>> on this one. Should we be concerned? Or is this just
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>> in the first line, and dividing pi by 180 first and multiplying larry
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>> floating
>> point operations, therefore I am not surprised they give slightly
>> different results.
>
> In other words, (a*b)/c is different than a*(b/c) with floats

```
IDL> a=0.32
IDL> b=!Pi
IDL> c=180.0
IDL> print,(a*b)/c-a*(b/c)
  4.65661e-10
```

It seems I can't resist to comment on my own posts today :)

Paolo

>
> Paolo
>
>>
>> Ciao,
>> Paolo
>>
>>> diff=curly-larry
>>> print,diff

>>>
>>> curly=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
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>>> larry = larry*!PI/180.
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>>> curly=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
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>>> curly *= !PI/180.
>>> larry *= !PI/180.
>>> diff=curly-larry
>>> print,diff
>>>
>>> The results:
>>>
>>> -3.72529e-009   0.000000   0.000000-9.31323e-010   0.000000
>>> 0.000000   0.000000
>>>   0.000000   0.000000   0.000000   0.000000   0.000000
>>> 0.000000   0.000000
>>>   0.000000   0.000000   0.000000   0.000000   0.000000
>>> 0.000000   0.000000
>>>
>>>
>>> Why aren't the first set of differences (where the assignment
>>> is made with the *= operator) *exactly* zero?
>>>
>>> Cheers,
>>>
>>> David
>>>
>>>
>>> --
>>> David Fanning, Ph.D.
>>> Fanning Software Consulting, Inc.
>>> Coyote's Guide to IDL Programming: http://www.dfanning.com/
>>> Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Friday Afternoon Puzzler
Posted by R.G. Stockwell on Fri, 12 Jun 2009 21:23:16 GMT
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"Paolo" <pgrigis@gmail.com> wrote in message
news:45fda197-6ddf-43c4-afe3-46d4bd1d4047@d38g2000prn.google groups.com...
>
>

> David Fanning wrote:
>> Folks,
...
>> curly=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
>> larry=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
>> curly = curly*!PI/180.
>> larry *= !PI/180.
>
> I'd argue that you are multiplying curly bi pi and dividing the result
> by 180
> in the first line, and dividing pi by 180 first and multiplying larry
> by the result
> in the second line.

oddly:

curly =[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
larry =[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
schemp =[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
curlyjoe=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]

curly = curly*!PI/180.
larry *= !PI
larry /= 180.

curlyjoe /= 180.
curlyjoe *= !PI

schemp *= !PI
schemp *= 1./180.

diff=curly-larry
diff2=curly-schemp
diff3=curly-curlyjoe

print,diff
print,diff2
print,diff3

IDL> .GO

0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000

0.000000 0.000000 1.86265e-009 9.31323e-010 4.65661e-010 4.65661e-010
1.86265e-009

0.000000 0.000000 1.86265e-009-9.31323e-010 0.000000 0.000000 0.000000

Subject: Re: Friday Afternoon Puzzler
Posted by R.G. Stockwell on Fri, 12 Jun 2009 21:30:44 GMT
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"R.G. Stockwell" <noemail87@please.com> wrote in message
news:h0uh0f$k2n$1@aioe.org...

specifically:

```
moe  = [-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
moe2 = [-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
moe3 = [-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]

moe *= 1. / 180.
moe2 /=180.
print, 'moe: ',moe - moe2
print, 'moe3: ',moe3 - moe3*1.
```

```
moe: 0.000000-9.31323e-010
 0.000000-4.65661e-010-1.16415e-010-1.16415e-010-4.65661e-010

moe3: 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000
```

Subject: Re: Friday Afternoon Puzzler
Posted by pgrigis on Fri, 12 Jun 2009 21:32:55 GMT
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R.G. Stockwell wrote:
> "R.G. Stockwell" <noemail87@please.com> wrote in message
> news:h0uh0f$k2n$1@aioe.org...
>
>
>
> specifically:
>
> moe = [-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
> moe2 = [-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
> moe3 = [-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
>
> moe *= 1. / 180.
> moe2 /=180.

The first line means: moe=moe*(1./180.)
The second line: moe=moe/180.

Different operations, again.

Ciao,
Paolo

> print, 'moe: ',moe - moe2
> print, 'moe3: ',moe3 - moe3*1.
>
>
> moe: 0.000000-9.31323e-010
> 0.000000-4.65661e-010-1.16415e-010-1.16415e-010-4.65661e-010
>
> moe3: 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000

Subject: Re: Friday Afternoon Puzzler
Posted by R.G. Stockwell on Fri, 12 Jun 2009 21:40:44 GMT
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"Paolo" <pgrigis@gmail.com> wrote in message
news:0d6bf583-80e0-4761-bc67-3c17aabe25ab@w35g2000prg.google groups.com...
>
>
> R.G. Stockwell wrote:
>> "R.G. Stockwell" <noemail87@please.com> wrote in message
>> news:h0uh0f$k2n$1@aioe.org...
>>
>>
>>
>> specifically:
>>
>> moe = [-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
>> moe2 = [-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
>> moe3 = [-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
>>
>> moe *= 1. / 180.
>> moe2 /=180.
>
> The first line means: moe=moe*(1./180.)
> The second line: moe=moe/180.
> Different operations, again.

Of course (doh) I simplified too much,

I found the difference between curlyjoe and schemp odd
in my previous post a bit odd, and tried to zero in on it.

cheers,
bob

Subject: Re: Friday Afternoon Puzzler
Posted by Michael Galloy on Fri, 12 Jun 2009 22:40:06 GMT
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Kenneth P. Bowman wrote:
> In article <MPG.249c6dccba4246d098a6e1@news.giganews.com>,
> David Fanning <news@dfanning.com> wrote:
>
>> Folks,
>>
>> If you've already had a beer, you may want to work
>> on this one. Should we be concerned? Or is this just
>> one more example for the Sky is Falling article?
>> I've voiced my opinion, but it didn't satisfy the
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>> diff=curly-larry
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>> Why aren't the first set of differences (where the assignment
>> is made with the *= operator) *exactly* zero?
>>
>> Cheers,
>>
>> David
>
> My guess is that the compiler/interpreter does the multiplication and
> division operations in a different order in the two statements in the
> first case. The other two cases are syntactically identical, so the
> operations should be carried out in the same order.

Yes, adding some parentheses makes the results agree:

```
IDL> curly=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
IDL> larry=[-1.912,-1.852,-1.386,-0.818,-0.343,-0.343,-1.233]
IDL> curly = curly*(!PI/180.)
IDL> larry *= !PI/180.
IDL> diff=curly-larry
IDL> print,diff
      0.00000      0.00000      0.00000      0.00000      0.00000
```

0.00000 0.00000

> *Why* the operations are done in a different order is the meta-
> question.

Well, in

```
curly = curly * !pi / 180.
```

operations are just done left to right since they all have the same precedence. In

```
larry *= some_value
```

some_value must first be calculated in order to use the *= operator.

Mike
--
www.michaelgalloy.com
Associate Research Scientist
Tech-X Corporation
