

## Ruby master - Bug #13078

with Integer a and b, a.fdiv(b) sometimes inaccurate than Rational(a, b).to\_f

12/27/2016 06:36 AM - metanest (Makoto Kishimoto)

<b>Status:</b> Closed	
<b>Priority:</b> Normal	
<b>Assignee:</b>	
<b>Target version:</b>	
<b>ruby -v:</b>	<b>Backport:</b> 2.2: REQUIRED, 2.3: REQUIRED, 2.4: DONE
<b>Description</b> For example, <pre>a = 3 b = 0x20_0000_0000_0001 p a.fdiv(b) p Rational(a, b).to_f  #=&gt; 3.3306690738754696e-16 3.330669073875469e-16</pre> <p>I'm hacking to solve this problem, see diff view. <a href="https://github.com/ruby/ruby/compare/trunk...metanest:fdiv_spike">https://github.com/ruby/ruby/compare/trunk...metanest:fdiv_spike</a></p>	

### Associated revisions

#### Revision 1778ed59 - 12/28/2016 04:40 AM - nobu (Nobuyoshi Nakada)

numeric.c: reduce fdiv

- numeric.c (rb\_int\_fdiv\_double): reduce first for more precise result. [ruby-core:78886] [Bug #13078]

git-svn-id: svn+ssh://ci.ruby-lang.org/ruby/trunk@57227 b2dd03c8-39d4-4d8f-98ff-823fe69b080e

#### Revision 57227 - 12/28/2016 04:40 AM - nobu (Nobuyoshi Nakada)

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#### Revision ea52cac1 - 03/11/2017 01:03 PM - naruse (Yui NARUSE)

merge revision(s) 57227: [Backport #13078]

```
numeric.c: reduce fdiv
```

```
* numeric.c (rb_int_fdiv_double): reduce first for more precise
result. [ruby-core:78886] [Bug #13078]
```

git-svn-id: svn+ssh://ci.ruby-lang.org/ruby/branches/ruby\_2\_4@57840 b2dd03c8-39d4-4d8f-98ff-823fe69b080e

#### Revision 57840 - 03/11/2017 01:03 PM - naruse (Yui NARUSE)

merge revision(s) 57227: [Backport #13078]

numeric.c: reduce fdiv

```
* numeric.c (rb_int_fdiv_double): reduce first for more precise
result. [ruby-core:78886] [Bug #13078]
```

## History

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### #1 - 12/28/2016 03:00 AM - wanabe (\_ wanabe)

The accuracy of Rational(a, b).to\_f seems to be due to reduction of fraction.  
How about using Rational object, or its internal function f\_gcd() and f\_idiv()?

### #2 - 12/28/2016 03:11 AM - nobu (Nobuyoshi Nakada)

I thought the reduction would be slower, but actually not significant.

```
$ ruby -rbenchmark -e 'a = 3; b = -0x20_0000_0000_0001; n=10_000_000; Benchmark.bm(13) {|x|x.report("Integer#f
div"){n.times{a.fdiv(b)}}; x.report("Rational#to_f"){n.times{Rational(a, b).to_f}}}'
          user      system      total      real
Integer#fdiv   3.420000    0.000000    3.420000 ( 3.446264)
Rational#to_f  3.450000    0.010000    3.460000 ( 3.465592)
```

### #3 - 12/28/2016 04:41 AM - nobu (Nobuyoshi Nakada)

- Status changed from Open to Closed

Applied in changeset r57227.

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numeric.c: reduce fdiv

- numeric.c (rb\_int\_fdiv\_double): reduce first for more precise result. [ruby-core:78886] [Bug #13078]

### #4 - 12/30/2016 12:53 PM - metanest (Makoto Kishimoto)

pull requested

<https://github.com/ruby/ruby/pull/1508>

### #5 - 03/11/2017 01:03 PM - naruse (Yui NARUSE)

- Backport changed from 2.2: UNKNOWN, 2.3: UNKNOWN, 2.4: UNKNOWN to 2.2: UNKNOWN, 2.3: UNKNOWN, 2.4: DONE

ruby\_2\_4 r57840 merged revision(s) 57227.

### #6 - 03/13/2017 02:30 AM - nagachika (Tomoyuki Chikanaga)

- Backport changed from 2.2: UNKNOWN, 2.3: UNKNOWN, 2.4: DONE to 2.2: UNKNOWN, 2.3: REQUIRED, 2.4: DONE

### #7 - 03/23/2017 03:26 AM - usa (Usaku NAKAMURA)

- Backport changed from 2.2: UNKNOWN, 2.3: REQUIRED, 2.4: DONE to 2.2: REQUIRED, 2.3: REQUIRED, 2.4: DONE