# Matrix#hermitian? failing to check diagonal elements

04/14/2012 03:48 AM - kernigh (George Koehler)

**Status:** Closed  
**Priority:** Normal  
**Assignee:** marcandre (Marc-Andre Lafortune)  
**Target version:** 2.0.0  
**ruby -v:** ruby 2.0.0dev (2012-04-14 trunk 35320) [x86_64-openbsd5.0]

**Description**

A Hermitian matrix is equal to its own conjugate transpose.

\[ \text{matrix} = \text{matrix} \text{.conj.t} \]

The bug is that Matrix#hermitian? fails to check the diagonal elements of the matrix. For example, the matrix in the next script is \((\text{not}\ (\text{not})\) Hermitian:

```ruby
require 'matrix'
i = Complex::I
p Matrix[[[-2, -3-i, 3+i], [-3+i, 3, -5-7*i], [3-i, -5+7*i, 9-4*i]].hermitian?
```

This script prints \((\text{true})). I expected \((\text{false})), because 9\cdot4\cdot i \neq 9+4\cdot i. Each diagonal element must equal its own conjugate (so, its imaginary part must be zero).

Matrix#symmetric? can skip the diagonal elements, because each number equals itself. Matrix#hermitian? must not skip the diagonal elements, because some number might not equal its own conjugate.

I attach a git diff with a simple fix to Matrix#hermitian?, and some test.

=end

**Associated revisions**

Revision b62792e5 - 04/16/2012 03:17 AM - marcandre (Marc-Andre Lafortune)

- lib/matrix.rb (hermitian?): Bug fix, patch by George Koehler [Bug #6290] [rubyspec:4b9573d7613]

git-svn-id: svn+ssh://ci.ruby-lang.org/ruby/trunk@35344 b2dd03c8-39d4-4d8f-98ff-823fe69b080e

Revision 35344 - 04/16/2012 03:17 AM - marcandre (Marc-Andre Lafortune)

- lib/matrix.rb (hermitian?): Bug fix, patch by George Koehler [Bug #6290] [rubyspec:4b9573d7613]

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History

#1 - 04/14/2012 03:53 AM - marcandre (Marc-Andre Lafortune)
- Category set to lib
- Status changed from Open to Assigned
- Assignee set to marcandre (Marc-Andre Lafortune)
- Target version set to 2.0.0

#2 - 04/16/2012 12:17 PM - marcandre (Marc-Andre Lafortune)
- Status changed from Assigned to Closed
- % Done changed from 0 to 100

This issue was solved with changeset r35344.
George, thank you for reporting this issue.
Your contribution to Ruby is greatly appreciated.
May Ruby be with you.

Files

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<th>File</th>
<th>Size</th>
<th>Date</th>
<th>Author</th>
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<tr>
<td>hermitian-fix.diff</td>
<td>1.24 KB</td>
<td>04/14/2012</td>
<td>kernigh (George Koehler)</td>
</tr>
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