

## Re: MuPad 3.0 extraction of individual eigenvectors

**Source:** <http://sci.tech-archive.net/Archive/sci.math.symbolic/2004-11/0067.html>

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**Date:** 11/11/04

Date: Thu, 11 Nov 2004 09:56:16 -0600

Ralf Hillebrand wrote:

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> Hi Brad,
>
> Brad Cooper wrote:
>
>> In MuPad 3.0 I can find eigenvectors as follows:
>>
>> A := matrix([[1, 1, 1], [1, 1, 1], [1, 1, 1]]):
>> S := linalg::eigenvectors(A);
>>
>> I now want to extract the eigenvectors from S
>> to use linalg::orthog(S) to orthogonalise these
>> eigenvectors.
>
>
> Torsten provided a solution in his posting, here is a less
> verbose one.
>
> Use map with op to extract the 3rd operands of the resulting
> list:
>
>>> map(S, op, 3) // or map(S, x -> op(x, 3))
>
> --- + - + - + - + - - - + - + - - -
> ||| -1 || -1 ||| 1 |||
> ||| 1 ||, | 0 ||, || 1 |||
> ||| 0 || 1 ||| 1 |||
> --- + - + - + - + - - - + - + - - -
>
> And since you want a flat list of vectors another op will do.
> The command below is equivalent to 'map(S, x -> op(op(x, 3)))'
> but even shorter and more efficient:
>
```

```

> >> map(S, op@op, 3)
>
> -- +- -+ +- -+ +- -+ --
> || -1 || -1 || 1 ||
> ||| | | |
> || 1 |, | 0 |, | 1 ||
> ||| | | |
> || 0 || 1 || 1 ||
> -- +- -+ +- -+ +- -+ --
>
> This is a valid input for linalg::orthog:
>
> >> linalg::orthog(map(S, op@op, 3))
>
> -- +- -+ +- -+ +- -+ --
> || -1 || -1/2 || 1 ||
> ||| | | |
> || 1 |, | -1/2 |, | 1 ||
> ||| | | |
> || 0 || 1 || 1 ||
> -- +- -+ +- -+ +- -+ --
>
>
>
>> I have found the problem I usually have with MuPad
>> is taking the output from a command and making further
>> use of that output as input to another command. Just
>> a general observation.
>
>
> Thats a point. If you find such problems, please tell us.
> Our bug tracking system (http://www.mupad.de/bugs.shtml) is
> not only for there for sending bug reports, but also for making
> suggestions for improvements.
>
> We can't fix problems that we don't know of. So, please help
> us to improve MuPAD by providing suggestions for improvements.
> A note about problems you find will do, too. Maybe we find a
> solution. I have just added a suggestion for this problem under
> the bug number 1542.

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It's often tedious to see how many nested op's,? are needed to get the nugget desired. The magical solution would be to select the desired part with a mouse, press the F\_whatever key, and have the correct expression appear on the next line.

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john