Re: Matlab −− Venting, Plus Miscellaneous Questions

Source: http://sci.tech−archive.net/Archive/sci.math.symbolic/2006−02/msg00076.html

- *From*: "David Wilkinson" <david@xxxxxxxxxxxxxxxxxxxxxxxxxxxxx>

- *Date*: Tue, 21 Feb 2006 07:20:09 −0000

Have you looked at MathCad? You just type the equations in directly in mathematical form as they would appear in a textbook or you would write them on paper. There are no command lines. Numbers of decimal places shown are easily set globally from a menu. It even works out the units for you.

"Steven O." <null@xxxxxxxx> wrote in message
news:pt9kv1tccsu6iequ9a1g8svobcuojlo5kt@xxxxxxxxxx

> I appreciate the detailed reply, and will look at some of the
> additional help resources and online resources you mention.
>
> In general, however, my comment would be that your reply confirms some
> of my misgivings. For example, in order to change the number of
> decimal places in the output of a symbolic calculation, I −− lazy user
> that I am −− I don't want to type in a special command syntax each
> time. I want global menu settings (via dialog boxes) that I can use
> to set this just once, and have it remain that way.
>
> Matlab is obviously intensively command−driven −− which means, I have
> to master a significant number of commands to use it. It's like
> learning a programming language, always a time−consuming process.
>
> I prefer software that lets me do as many things as possible via
> dialog boxes, popup menus, etc, and this software is apparently not
> designed with that in mind. I'm sure it's great for many
> calculations, and obviously I'll have to learn something about it for
> my class. But for anyone searching the web for info on Matlab, if
> they come across this thread, at least they'll have some idea of what
> to expect from the software.
>
> Regards,
> Steve O.
>
> On Mon, 20 Feb 2006 02:52:56 −0500, "Steven Lord"
> <slord@xxxxxxxxxxxxx> wrote:
>
>> "Steven O." <null@xxxxxxxx> wrote in message

news:llniv1h7lra4d50bmspigite2nsul5kavb@xxxxxxxxxx

> I have just started using Matlab the past two weeks for a class. You
> know, sometimes you get a new package of software, and start using it,
> and right off the bat it seems pretty intuitive. That doesn't mean
> you never have to look in the manual, or check the Help, but most
> things that you seem to need appear right at hand on the menus, or on
> context−sensitive pop−up menus, etc.
>
> Matlab is not one of those programs. So far, as far as I'm concerned,
> it's a total piece of shit, at least in the user−friendliness
> category. It may very well be able to do extraordinary math things,
> once you know the program well enough. But nothing that I need to do
> is readily apparent, and hunt as I might, I can't seem to find the
> answers to many (most?) of the questions that I have in either the
> print or online documentation. Damn, I hate programs like this, you
> waste more energy trying to figure them out than you put into actually
> using the piece of crap.

If you have any suggestions for ways that we could make MATLAB more user−friendly, please let us know. Our usability, documentation, and development staff are always interested in hearing user feedback. You can use this form to submit your feedback, or contact technical support if you have comments/questions that you'd like to speak to someone about in a more
real−time manner:

http://www.mathworks.com/support/contact_us/ts/ebd/enhance_bug_doc_1.html

> Okay, I've vented −− and other buyers, beware −− and now maybe some
> users will be good enough to help me with some questions.
>
> 1. I want to reduce the number of decimal characters the program
> shows. I found how you could do that under Preferences for numeric

> calculations, but symbolic calculations keep showing some ridiculous
> number of decimal places, I haven't even counted. Is there a way to
> fix that? Here's some of what I mean:

There are two ways. To change the number of decimal places to which all symbolic expression are displayed, use the DIGITS function.

http://www.mathworks.com/access/helpdesk/help/toolbox/symbolic/digits.html

To display a specific symbolic expression to a certain number of places, use
the VPA function.

http://www.mathworks.com/access/helpdesk/help/toolbox/symbolic/vpa.html

Note that neither of these will work with numeric expressions, just with symbolic expressions.

```
EDU>> 2/3
ans =
0.66667 %This is okay.
```

Yes, this is a normal double precision computation; no symbolic expressions
involved.

```
EDU>> eqn = '4/s = (3000 + .033*s + (10^9)/s) * I';
EDU>> Ifr = solve(eqn,'I')
Ifr = 4000./(3000000.*s+33.*s^2+1000000000000.)
```

The Symbolic Math Toolbox, in which the SOLVE function is included, is trying to represent the coefficients you entered as close to exactly as it can.

```
EDU>> Itd = ilaplace(Ifr)
Itd =
.721335707733945831678152852202 28e−3*exp(−45454.545454545454545454545454545*t)
% This is NOT okay!!!!
```

The default value for the DIGITS function is 32 digits, and it looks like that's what is being displayed. [I haven't counted.] Try:

```
Itd = vpa(ilaplace(Ifr), 5)
```

You should receive this:

```
Itd =

.72134e−3*exp(−45455.*t)*sin(.16804e6*t)
```

> 2. Matlab does not seem willing to plot symbolic
> expressions, or to
> convert symbolic expressions to regular numeric expressions.
> Using
> the example just above, can anyone tell me how to get the
> program to
> plot "ltd" as a function of time? (FYI, the calculations come
> up in
> the process of finding the time behavior of a simple RLC
> circuit.)

There are a couple of ways. One is to use the EZPLOT function:

```
ezplot(Itd, [0 pi]) % EZPLOT the function from t=0 to t=pi
```

Note that the large negative coefficient of t in the EXP call causes the function to drop down close to 0 pretty quickly.

An alternate way to plot this function is to substitute values into the expression using the SUBS function, then call the normal PLOT function.

```
t = 0:1e−4:1;
Itd_double = subs(Itd, 't', t);
plot(t, Itd_double)
```

Adjust the increment or contents of the t vector to show the part of the function that you want to see.

> 3. If you have a symbolic expression like
> '4/5*exp(−t)*sinh(t)', how
> do you tell Matlab to convert the 'sinh(t)' to it's exponential
> parts,
> and then carry through the multiplication with the 'exp(−t)'
> term?

There isn't an automated way to do this, but you can call the SIMPLE function on the expression, then copy the expression that's displayed in the
simple(exp) section and use the EXPAND function on it.

```
syms t
s = sym('4/5*exp(−t)*sinh(t)');
simple(s)
% copy and paste part of the result of the SIMPLE call
expand(4/5*exp(−t)*(1/2*exp(t)−1/2/exp(t)))
```

> 4. Let's say I do the following:
>
> ```
> EDU>> eqn2 = 'x = y + 3'
> eqn2 = x = y + 3
> EDU>> y=1:2:10;
> EDU>> eqn2
> eqn2 =
> x = y + 3
> ```
>
> But wait, that's not what I want! I want a list: 4 6 8, etc. How do I make that happen? And then on the other hand...

I'm not exactly sure what you want, but I think you can either use SUBS:

```
eqn2 = 'x=y+3';
y = 1:2:10;
subs(eqn2, 'y', y)
```

or EVAL:

```
eqn2 = 'x=y+3';
y = 1:2:10;
eval(eqn2);
x
```

> 5. Suppose I now enter:
>
> ```
> EDU>> z = y+3
> z =
> 4 6 8 10 12
> ```
>
> Okay, that's good... but suppose I want to be reminded of my definition of z? How do I get that back again, without have to scroll
> through the command history?

The way you've defined it, you can't. MATLAB evaluates the expression y+3 then assigns the result to the variable z. If you defined it as:

```
z = sym('y')+3
```

then evaluating sym('y')+3 gives you y+3, which gets assigned to z.

> 6. Is there any way to tell the command history to stay at the currently highlighted command, rather than autoscrolling to the bottom
> each time I enter a new command?

No, not as far as I am aware. That would be a good enhancement request to fill in the form at the link I posted above.

> 7. Is there a way to save and restore, not the data, but the sequence of commands and responses in the command window? So that I
> can open the command windows, and fully restore all those commands?

You can either create an M−file and write your commands there, or use the DIARY function, or (if you're using version 7.0 or later of MATLAB) use the
publishing functionality of the MATLAB Editor. There are sections of the MATLAB documentation covering each of these capabilities:

Creating and using M−files
http://www.mathworks.com/access/helpdesk/help/techdoc/learn_matlab/ch5pgmgm.html#14154.

The DIARY function
http://www.mathworks.com/access/helpdesk/help/techdoc/ref/diary.html

Publishing capabilities
http://www.mathworks.com/access/helpdesk/help/techdoc/matlab_env/notebook.html#22454

> That's all for now. (I'll spare you my plotting problems, at least
> for now.) I'm sure there will be more to follow. I'm looking forward
> to hating this program even more as time goes by.

I have a few suggestions. The first five questions you asked were about the
functionalities of the Symbolic Math Toolbox −− if you were looking in the main MATLAB documentation for information on those capabilities, you probably wouldn't have found much. In the Help Browser (which you can access using the DOC function or the question mark in the toolbar at the top

of the desktop, among other locations) look at the Symbolic Math Toolbox documentation instead of the MATLAB documentation when working with symbolic
expressions.

Secondly, we have written a section of the documentation specifically targetted to help new users up the learning curve of MATLAB a bit easier. You might find it easier to understand than the full documentation, as the full documentation tries to cover both basic functionality and advanced usage, while the Getting Started documentation helps you, well, get started.
The online version of the Getting Started documentation for the latest version of MATLAB is here:

http://www.mathworks.com/access/helpdesk/help/techdoc/learn_matlab/learn_matlab.html

It's also available in your Help Browser

Finally, there's a newsgroup specifically for MATLAB that tends to be (more
or less) friendly to new users, as long as you don't post a question like "I
need full code on exactly how to do X [advanced image processing or signal processing, speech recognition, etc.] for my project! My project is due in
a week, so send it to me immediately!". The name of that newsgroup is comp.soft−sys.matlab (often called CSSM by regular readers), and you can access it from The MathWorks website:

http://www.mathworks.com/matlabcentral/

The plotting function comments/questions/rants that you alluded to would probably be better suited for CSSM than sci.math.symbolic, and who knows −−
with CSSM's help, you might just find you like (or at least are able to use
more effectively) MATLAB.

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