

Laplace

PIK

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COLLABORATORS

	<i>TITLE :</i> Laplace		
<i>ACTION</i>	<i>NAME</i>	<i>DATE</i>	<i>SIGNATURE</i>
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Chapter 1

Laplace

1.1 usage

- Laplace Manual ↔

----- Usage -

3) Using Laplace

Laplace works much like a shell, you enter an expression, press return and Laplace gives you the result (after some time;-).

To learn about the input format that is used to tell Laplace, what it should do, have a look at the expression syntax.

When a new window is opened, Laplace confronts you with an empty environment. In most cases you will include the standard libraries using `include("init.lh");`, that's why this expression is always inserted as a default. You just have to press return to execute this expression, and continue with your work.

To avoid confusion, a line (consisting of your input and the result) is from now on called an entry, because itself may consist of several lines.

Each entry consists of two parts: your input and the result. Your input may consist of several line and always starts at an input prompt.

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1.2 structure

- Laplace Manual ----- Hierarchical structure -

3.1) Hierarchical structure

Laplace works strictly hierarchically. This means that all the results of an entry can only influence the following entries. There is usually no way to have a backward effect. If you define a variable or function, it can only be referenced from the following entries. In the preceding entries it's just unknown. If you later assign a new value to this variable, the old value is not discarded; it can still be used in the intervening entries, e.g.

```

> ...      (a is unknown here)
> a := 5;  (a evaluates to 5)
> ...
> ...
> a := 7;  (a now evaluates to 7, but remains 5 in the preceding entries)
> ...

```

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1.3 gui

- Laplace Manual ----- The graphical ↔
interface -

3.2) The graphical interface

Laplace presents you a (hopefully) comfortable graphical interface. You can

open as many windows as you want, each window has it's own environment and you can work with several projects simultaneously.

Laplace features bubble help. Just leave the mouse pointer on an item and wait a moment and a short description will be shown.

Edit windows

Each window is separated into three major parts: the toolbar at the top, an statusbar at the bottom and the main editing area in the middle.

The leftmost field of the statusbar just displays whether you modified the current project since the last time that you saved it. It's right neighbour is a cycle gadget that lets you select the current editmode . The remaining space is filled by a text-field that displays the current cursor position.

But the most interesting thing is the big area that fills up most of the window. Here the action takes place. You can scroll around in this area using the two sliders at the right and bottom. Laplace works just like a shell, you enter a command line, Laplace displays the result and you advance to the next line and so on. The main difference is that you can move up and make some modifications that may influence the results of the following lines.

The scheduler window

Apart from the windows, where you enter your formulas, there is one small window that always appears, while Laplace is running. It's something like a main-control-panel . At the bottom is a text field that displays the state of Laplace's calculation engine. Each time when a calculation has finished, the elapsed time is displayed. The abort-button can only be used with asynchron calculation; it will interrupt the current calculation.

The scheduler window has it's own menu:

- Project
 - About - Show some information about Laplace.
 - New window - Open a new and empty window.
 - Preferences... - This will open the preferences window. See preferences for more information.
 - Quit - Close all windows and exit Laplace. If there are recent changes, you will be asked whether you want to save the changes, but you cannot abort this operation.
- Hidden This menu has a special meaning. If you hide an edit window, it's title will appear in the menu. Selecting this entry will reopen the window.

1.4 editmodes

- Laplace Manual ----- Editmodes -

3.3) Editmodes

Sometimes you want to enter a long expression or a definition of a procedure. It would be quite annoying to do this in a single line. Laplace offers two different modes for this reason (the only difference is the handling of the return-key). If you are in singleline mode, pressing return tells Laplace to evaluate the expression, return the result to you and advance to the next entry. In multiline mode return adds a new line to the current entry in the same way as you know it from a usual text editor. You can split an expression at every point, where a space is allowed, Laplace doesn't distinguish between spaces and line breaks.

Holding down the shift key reverses the effect: press shift-return to evaluate an expression while you are in multiline mode, or to split a line while you are in singleline mode.

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1.5 history

- Laplace Manual ----- History -

3.4) History

Laplace offers an easy way to copy some input that you already used before. Hold down the control key and press the up or down key. Then the contents of the succeeding or preceding entry will be copied to the current entry. By repeatedly pressing the up/down key you can move further up or down in the list of entries.

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1.6 clipboard

- Laplace Manual ----- ↩
Clipboard -

3.5) Clipboard

Laplace supports the global clipboard. You can mark some text using the mouse and then cut it out or just copy it to the clipboard. You can ↩ later paste in the contents of the clipboard at the cursor position. Since the clipboard is global to all applications you can easily exchange short parts of

text between different programs. Laplace uses the clipboard unit zero.

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1.7 menu

- Laplace Manual ↔

----- The menu -----

3.6) The menu

A menu is connected to each window. Some actions only apply to the active window, but some are global to all windows (e.g. Quit ;-).

Many menu items have a keyboard shortcut, e.g. A-l for Load...: Holding down the right AMIGA-key and pressing l works just like activating the item with your mouse.

Some menu items are marked by some trailing dots, like Save as.... This means that more user input is required, if you select this entry. Otherwise some action is immediately performed.

The menustrip is now fully configurable. At this place I will give you a description of the default configuration.

The Project menu

- About - Show some information about Laplace.
- New window - Open a new and empty window.
- Open... - Opens a requester where you can choose a project to be opened. If the current window is empty, it will be used, otherwise a new window is opened.
- Load... - Similar to Open..., except that it will always use the current window.
- Save - Save the current project under it's old name. If you haven't chosen a name for it, this works just like Save as...
- Save as... - Opens a requester where you can choose the path and name for the current project and save it. The selected name will be used if you select Save at a later moment.
- Import... - Read a project from an ASCII file.
- Export... - Write the current project as an ASCII file.
- Hide - This will temporarily close the current window. A new menu item in the Hidden-menu of the scheduler window. Selecting this item will re-open the window.
- Close - Close the current window. If there are some recent changes that are not saved, you will be asked what should be done. When you close the last window, Laplace will quit.
- Quit - Close all windows and exit Laplace. Again you will be asked, if there are recent changes, but you cannot abort this operation.

The Edit menu

- Mark all - This marks all characters of the current entry, just as if you used the mouse for this.

- Unmark - If there is some text marked in the current entry, this mark will be removed.
- Cut - Cut out the currently marked text and copy it to the clipboard
- Copy - Copy the currently marked text to the clipboard and leave it where it is.
- Paste - The text from the clipboard is inserted at the current cursor position.

The Entries menu

- Insert - Insert a blank entry just before the current one, and make the new one active.
- Remove - Removes the current entry including it's result (if there is one).
- Remove all - Clear all entries in the current window.
- Clear result - Discard the result of the current entry. This will also remove all definitions, options etc. associated with this entry.
- Clear all results - Discard the results of the all entries. This will also remove all definitions, options etc.

The Preferences menu

- Global... - This will open the preferences window. See preferences for more information.
- Plotter... - Open the settings window for the plotter. You can edit the global settings that are used as default when a new plotter is opened.

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1.8 toolbar

- Laplace Manual ----- ↩
The toolbar -

3.7) The toolbar

The toolbar at the top of each window offers you a fast access to some functions that are usually available in the menu.

Just like the menu strip, you can configure the toolbar freely. Again, this is only a description of the default configuration.

- Cut - Cut out the currently marked text and copy it to the clipboard.
- Copy - Copy the currently marked text to the clipboard and leave it where it is.
- Paste - The text from the clipboard is inserted at the current cursor

- position.
- Preferences - This will open the preferences window. See preferences for more information.

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1.9 keyboard

- Laplace Manual ----- ↔
The keyboard -

3.8) The keyboard

Probably most work is done using your keyboard. I think that most functions are straight ahead as you would expect it (and know it from common text editors), but you may adjust the keyboard mapping to your own requirements.

If you are working with asynchron calculation, you can interrupt the current calculation by pressing control-c. You cannot change this key combination.

If you enable erase block in the preferences window and there is some text marked, this text is replaced by your input. Without erase block the mark is abolished.

There are two unusual keys that Laplace uses: \times and \pm . \times ↔
 \times is not the usual ↔
x, but can be entered by alt-x. To enter the \pm sign press alt-y on ↔
German key- ↔
boards or alt-z on other boards (the same key, just another label).

Here is the key mapping of the default configuration:

- left, right, up, down - Cursor movement. If you move across the border of the current entry, you jump to the next/previous entry.
- shift-left, shift-right - Jump to the next/previous word.
- alt-left, alt-right - Jump to the beginning/end of the current line.
- shift-up, shift-down - Jump to the first/last line of the current entry.
- alt-up, alt-down - Jump to the entry that is just above/below the visible part.
- shift-alt-up, shift-alt-down - Jump to the first/last entry.
- control-up, control-down - Move one step forward/backward in the history buffer.
- shift-control-up, shift-control-down - Move to the first/last entry in the history buffer.
- backspace - Delete the preceding character.
- shift-backspace - Delete to the beginning of the current line.
- delete - Delete the succeeding character.
- shift-delete - Delete to the end of the current line.

- alt-delete - Clear the result of the current entry.
- enter - Singleline mode : Evaluate the current line and proceed to the next entry. Multiline mode : Insert a new line to the current entry.
- shift-enter - Singleline mode : Insert a new line to the current entry. Multiline mode : Evaluate the current line and proceed to the next entry.

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1.10 mouse

- Laplace Manual ----- About mice ↔
and men... -

3.9) About mice and men...

You can use the mouse to change the active entry or to mark some text, thereby you can then make use of the clipboard

.

If you make a double click on an entry, this has the same effect as pressing return: The expression will be evaluated and the result is shown.

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1.11 preferences

- Laplace Manual ----- The preferences window -

3.10) The preferences window

Almost everything configureable...

Sorry, no docs written now. But I think, most parts should be self-explaining.

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1.12 projects

- Laplace Manual ↔

----- Projects -

3.11) Projects

Projects are usually placed in the Projects directory.

Laplace uses now a binary file format. This offers the new possibility to load a project in (almost) exactly the same state as you saved it, including all results, definitions and options. You can enable this feature in the

preferences
window.

If you still want to import a project in your favorite ASCII editor, you can use the Export... function from the Project menu. This will create a file only with the input lines, each one separated by a blank line. You can also Import... such an ASCII file.

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