

Laplace

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	<i>TITLE :</i> Laplace		
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REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME

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Chapter 1

Laplace

1.1 historylog

- Laplace Manual ----- History -

1) History

Release V0.1 (Evaluation version) released 9.3.1996 :

- First public release.

Release V0.2 (Evaluation version) released 27.3.1996 :

- 14.3.1996:
Improved simplification of expressions.
 - 18.3.1996:
remove bug when displaying floatpoints (why the hell is IEEEEDPPow(x, y)
 y^x and not x^y ???).
more optimizations:
 $(-x)^n$ with n even real $\rightarrow x^n$,
 $(a*b)^x \rightarrow a^x * b^x$
display a/b now as fraction, not as $a*b^{-1}$
 - 19.3.1996:
Added Preference window.
Shell now uses selectable pens.
Laplace crashed when selecting Project/Quit instead of closing the win-
dow to quit.
Doesn't use string-gadget as input anymore.
 - 20.3.1996:
Double click now evaluates expression (suggested by Thomas Schraitle).
German catalog added.
Window size and position is now remembered.
Added ARexx port.
Added ARexx command EVALUATE.
 - 21.3.1996:
Added clipboard support.
`diff()` almost works ;-)
 - 22.3.1996:
Graphical output looks now much better.
-

Puuh, found that nasty bug in `diff()` .
Added `acot()` , `asinh()` , `acosh()` , `atanh()` and `sign()` .

Release V0.3 (Evaluation version) released 05-APR-1996 :

- 28.3.1996:
 - Bug in e.g. `1/(-0.5)` removed.
 - Bug in window update removed, which sometimes caused object not to be drawn again.
 - Added Help menu.
 - Removed usage of `Laplace:`, uses `PROGDIR:` instead (suggested by Lars Bischoff).
 - 30.3.1996:
 - Added some ARexx commands.
 - `sin(neg(a))` -> `neg(sin(a))`
 - `cos(neg(a))` -> `cos(a)`
 - `sinh(neg(a))` -> `neg(sinh(a))`
 - `cosh(neg(a))` -> `cosh(a)`
 - `ln(a ^ b)` -> `b *ln(a)`
 - 31.3.1996:
 - Bug in floatpoint display removed.
 - Added object and function popup lists.
 - Bug in `OP_MUL` display removed.
 - Added tootype support.
 - Added greek letter support.
 - Added equation class.
 - Added `eq()` , `eqlleft()` , `eqlright()` commands.
 - 1.4.1996:
 - It's not a joke, it's a...
 - Display is now built up in background.
 - Bug in `OP_NEG` display removed.
 - Bug in `neg(matrix)` removed.
 - Avoid 'key-eater' problem by moving Insert/Remove into menu.
 - Added some edit functions.
 - 2.4.1996:
 - Added simplify method.
 - Added simplify option.
 - If there is a default project icon, it should be used ;-)
 - Converts floats to fraction, if possible.
 - Added precision option.
 - `sqrt()` , `sin()` etc. on reals only evaluated, if wanted/possible.
 - `sqrt()` now look like a real square root (not too pretty though..)
 - 3.4.1996:
 - Evaluation now uses at look up table instead of directly coded pattern matching. Reduces size of the executable by 20k and source by 80k!! 80k source are now replaced by a small 2k ASCII file and ~17k source to handle it :-O
 - It's a small step for the user, but it's a great step for the coder. - N.Armstrong
 - 4.4.1996:
 - Added `fak()` , `taylor()` .
 - Added F-Key support.
-

Release V0.4 (Evaluation version) released 20.6.1996 :

- 15.4.1996:
Use DICE V2.07 now, featuring pragmas !! (This was my free update, ehem...)
- 18.4.1996:
Fixed bug in `diff(pot(a,b))` with `b` containing parameter (reported by Mario Kemper).
- 21.4.1996:
Added adjustable exponential display.
- 1.5.1996:
Added set class.
Added adjustable display precision.
Added function `set()` .
Function popup now uses external list.
Added functions `count()` , `average()` , `sigma()` , `error()` .
Added control codes in F-key strings.
- 3.5.1996:
Added functions `vprod()` , `dim()` , `norm()` .
- 4.5.1996:
Added functions `cols()` , `rows()` , `orthogonal()` , `norm()` for matrices.
- 5.5.1996:
Added functions `cvector()` , `rvector()` .
- 7.5.1996:
Improved real evaluation a bit.
- 12.5.1996:
Added 'putting outside the brackets' (Is there really no shorter english word for this??), but still not perfect.
- 17.6.1996:
Renamed `rang()` to `rank()` ;-)
Matrix inversion works again. Use `invert(matrix)` instead of `inv(matrix)` .
- 20.6.1996:
Small bug removed when adding to set object.

Release V0.5 (Evaluation version) released 7.8.1996 :

- 21.6.1996:
Added boolean class.
 - 22.6.1996:
Added `isreal()` , `isvector()` , `ismatrix()` , `isset()` , `isequation()` , `isboolean()` , `isatomar()` , `if()` , `for()` , `drop()` commands.
Added new operators `&&` , `||` , `!` , `==` , `!=` , `>` , `>=` , `<` , `<=` .
 - 24.6.1996:
Added automatic error calculation. WOW!! Quite experimental feature, but really fantastic ;-)
 - 25.6.1996:
Vector product now as operator, no function anymore.
Improved atomar evaluation a bit.
Reorganized options menu.
Open projects directly by shift-click 'em on WB.
 - 28.6.1996:
Drop a project icon into window to load it.
Added project identifier to project files.
 - 29.6.1996:
-

- Rewrote preferences handling.
- Added customizable ARexx menu.
- 2.7.1996:
 - Added some ARexx commands.
- 3.7.1996:
 - Internal handling of pi , e and i implemented.
- 7.7.1996:
 - OP_ADD, OP_MUL now as binary operators. Lost a lot of simplification features ;-(
- 10.7.1996:
 - Improved evaluation and simplification. Still lots of features not reimplemented ;-(
- 14.7.1996:
 - Removed vector() and matrix() functions, use [...] instead.
- 16.7.1996:
 - Some internal changes.
- 17.7.1996:
 - Fonts are now configureable.
- 19.7.1996:
 - Started translation of manual to german.
- 21.7.1996:
 - Still not perfect, but almost...
- 22.7.1996:
 - Added random() , irandom() , randomseed() .
 - Cursor flash rate adjustable.
- 23.7.1996:
 - Added better ASCII output. Not useful now, but for later use..
- 27.7.1996:
 - Source totally reorganized. Took some long nights... I think it's much faster now... Didn't do any benchmarks so far... Everything is ready now for an UN*X port...
- 6.8.1996:
 - Uses RevUp for revision control.
 - Some minor fixes.
- 7.8.1996:
 - Added nice startup picture.:
 - Added support for MWB palette.

Release V0.6 (Evaluation version) released 27.8.1996 :

- 12.8.1996:
 - β 1 : added installer script.
 - β 6 : added Contribution file to installation.
 - 13.8.1996
 - β 7 : removed usage of avop.library.
 - β 10 : optimization of LPPM_Laplace_DoEvaluate.
 - 14.8.1996:
 - β 20 : sets and equation need not to be on the left side anymore.
 - β 21 : remove LPPM_Laplace_Evaluate/Simplify.
 - 15.8.1996:
 - β 30 : rewrote diff() .
 - β 31 : rewrote combine() .
 - β 32 : reimplemented float to fraction conversion.
 - β 33 : optimized LPPM_Laplace_ExtractRefs.
 - β 40 : rewrote lk_FatalError() .
-

- ß 50 : fixed bug in real multiplication (caused strange error ranges).
- ß 51 : removed strange bug in orthogonal() .
- ß 52 : added def_Presets icon.
- 16.8.1996:
 - ß 58 : fixed taylor() .
 - ß 59 : fixed fak() .
 - ß 60 : improved sum sorting.
 - ß 72 : added gadget for debugmode.
- 18.8.1996:
 - ß 75 : added DVI manual.
- 22.8.1996:
 - ß 77 : reimplemented $\sin(\pi)=0$, $i^2=-1$ etc.
 - ß 83 : π is now shown as greek letter.
 - ß 85 : fixed search-path for docs (reported by Christoph Dahlen and Ken Tyler).
- 23.8.1996:
 - ß 90 : improved DVI manual.
- 24.8.1996:
 - ß 91 : added Format class for later use.
 - ß 95 : removed About class, uses Format class instead.
 - ß 97 : removed Error class, uses Format class instead.
- 25.8.1996:
 - ß 100 : bugfix in product simplification.
 - ß 110 : sum simplification should be on the old level now ;-)
 - ß 111 : fixed multrow() .
 - ß 112 : fixed umatrix() .
- 26.8.1996:
 - ß 117 : Added external tool BreakLaplace.
- 27.8.1996:
 - release it.

Release V0.7 (Evaluation version) released 19.8.1996

- 27.8.1996:
 - ß 3 : moved about message to startup window.
- 28.8.1996:
 - ß 9 : removed name conflict with OS.
 - ß 10 : replaced about window by startup window.
 - ß 18 : added complex class. See 'Manual', Section 3.7 'Types'.
 - ß 23 : new type handling.
 - ß 28 : removed constshow class, use format instead.
 - ß 30 : removed show class, use format instead.
 - ß 32 : seperate catalog file for kernel.
 - ß 36 : improved format class.
- 29.8.1996:
 - ß 41 : removed showgroup class, use format instead.
 - ß 45 : new about picture.
 - ß 50 : fixed bug with nested references.
 - ß 53 : new function arc() . See 'Functions'.
- 30.8.1996:
 - ß 59 : new function im() , re() and conj() . See 'Functions'.
 - ß 61 : added menu item Iconify.
- 1.9.1996:
 - ß 75 : new settings handling.

- β 77 : added dynamic options. See 'Manual', Section 3.10 'Options'.
- β 79 : new commands showhelp() , quickhelp() . See 'Functions'. fast onlinehelp with ?keyword and ??keyword. See 'Manual', Section 3.11 'Online help'.
- β 83 : added null class.
- 5.9.1996:
 - β 87 : changed Installer script NOT to use my own Lha... Sorry for this embarrassing mistake!
 - β 88 : add Copyright file to installation.
 - β 98 : implemented new system for fraction/floatpoint handling.
- 6.9.1996:
 - β 123 : removed obsolete tags.
 - β 138 : improved simplification of things like $2*\sqrt{3}$.
- 7.9.1996:
 - β 147 : finally solved (I hope..) problems with nested references.
 - β 148 : added Delete menuitem. icons are saved with preset files.
- 8.9.1996:
 - β 154 : Unknown vars are not always declared as constant number objects. See 'Manual', Section 3.8 'Definitions'
 - β 155 : a function reference without parameters now uses default parameters: $f \rightarrow f(x)$, if you declared $f(x)=...$ before. See 'Manual', Section 3.8 'Definitions'
 - β 156 : added c001 sound to about requester.
- 9.9.1996:
 - β 157 : fixed taylor() .
 - β 158 : new syntax for taylor() . See 'Functions'.
 - β 159 : new syntax for diff() . See 'Functions'.
- 14.9.1996:
 - β 160 : added Help/ARexx menu. added bubblehelp for the settings requester.
- 19.9.1996:
 - Release it!!

Release V0.8 (beta-release) released 13.3.1997

- 20.9.1996:
 - β 1 : added matrix() and vector() . See 'Functions' for command syntax.
 - 21.9.1996:
 - β 2 : yo, that was a long night!! One of these 'changing-almost-everything' session... still not complete, but that's enough for now, I'm hungry...
 - 22.9.1996:
 - β 3 : wow, seems to work. Some bugs, of course, but I didn't expect it would work at all! Now sets and equations should be handled correctly.
 - β 4 : fixed bug in matrix operations.
 - β 5 : fixed bug in taylor() .
 - β 6 : optimized equation and set handling.
 - 30.9.1996:
 - β 7 : changed to Texinfo 2.145 and a modified version of makeinfo 1.63. improved documentation outfit.
 - 1.10.1996:
 - β 8 : improved simplification of $\cos(2*\pi)$ etc.
-

- 13.10.1996:
 - β 9 : expression parser has been completely rewritten. much more powerful than ever before!!
 - 15.10.1996:
 - β 10 : it will now start up even if the startupwindow can't be opened. startupwindow closes after a few seconds without userinput.
 - 24.10.1996:
 - β 11 : added dynamic option $\$$ rowvectors. suggested by Daniel van Gerpen. see 'Manual', Section 3.10. 'Options'.
 - 25.10.1996:
 - β 13 : added dynamic options $\$$ centered, $\$$ widelines. suggested by Christoph Rickers. see 'Manual', Section 3.10. 'Options'.
 - β 14 : changed directory tree.
 - β 15 : fixed help in function popup.
 - β 16 : added function element() . see 'Functions'.
 - 26.10.1996:
 - β 17 : added dynamic option $\$$ thicklines. suggested by Christoph Rickers. see 'Manual', Section 3.10. 'Options'.
 - β 18 : packed all textfiles of the contribution archive into one guide.
 - 30.10.1996:
 - β 19 : removed bug with 'power of integer', e.g. $70000 \wedge 4$.
 - β 20 : prepared code for scaleable fonts.
 - 5.11.1996:
 - β 21 : removed bug in complex display. reported by Fredrik Orinius.
 - 10.11.1996:
 - β 22 : startup window is centered on visible part of screen. suggested by Christoph Rickers. he also told me how to do it!
 - β 23 : added ToolType QUIETSTARTUP. See 'Manual', Section 2.3 'Tooltypes'. suggested by Christoph Rickers.
 - β 24 : startup window is erased in a subtask.
 - β 25 : set busypointer in startup window.
 - 15.11.1996:
 - β 26 : implemented TeX export, but currently without frontend-command.
 - 19.11.1996:
 - β 27 : puhh, that was quite difficult, but I think the new parser is now working (after the third or fourth complete new attempt...). the next step is the evaluation of the generated token list... this could be even more work... I will see...
 - β 28 : btw. β 9 doesn't say the truth... that was just the first step..
 - 22.11.1996:
 - β 29 : Some cosmetic changes of the dvi-manual ;-)
 - 24.11.1996:
 - β 30 : added string class.
 - β 31 : added function export() . see 'Functions'.
 - β 32 : added functions fopen() , fclose() , freadln() , fwriteln() , eof() . see 'Functions'.
 - 25.11.1996:
 - β 33 : Added 'Prefs.dat' file. Not documented yet...
 - 29.11.1996:
 - β 34 : You can now press CTRL-C during startup to abort Laplace.
 - 11.12.1996:
 - β 35 : bugfix: startupwindow could get wider than expected. re-
-

- ported by Christoph Rickers.
- 16.12.1996:
 - β 36 : You can now use any expression for a dynamic option.
 - β 37 : Can now query the value of a dynamic option.
 - 17.12.1996:
 - β 38 : added functions `prefsset()` , `prefsget()` , `prefsdel()` and `interpret()` .
 - 21.12.1996:
 - β 39 : Yeah! Procedures now work!
 - 23.12.1996:
 - β 40 : new parser seems to work properly. kicked out the old one! say goodbye to about 100k of source!!!!
 - 24.12.1996:
 - β 41 : rearranged internal handling of complex numbers.
 - β 42 : rearranged internal handling of error distribution.
 - 27.12.1996:
 - β 43 : kicked out handling of real number. now everything works with complex numbers.
 - 28.12.1996:
 - β 44 : now I'm using binomic development for 'power of complex number' with small integer exponents. => e.g. i^2 is now exact -1 ;-)
 - 29.12.1996:
 - β 45 : numbers with an error are now always shown as floatpoint even if they are internally a fractional.
 - β 46 : Values with error are now always enclosed in square brackets.
 - 30.12.1996:
 - β 47 : new option `$iref`. If set to TRUE, you must enter `li` to get the number, while `i` is interpreted as a reference.
 - β 48 : added option `$denumwidth`.
 - 31.12.1996:
 - β 49 : new online-help mode `?!keyword`
 - 11.1.1997:
 - β 50 : Once again some major changes. This time I completely rewrote the GUI. And once again, it's only partially implemented.
 - 12.1.1997:
 - β 51 : added block marking facility.
 - 15.1.1997:
 - β 52 : added subexpression feature in reference names. See documentation for details (not written yet ;-)
 - 16.1.1997:
 - β 53 : optimized matrix and vector operations.
 - β 54 : added boolean operation for vectors and matrices.
 - 18.1.1997:
 - β 55 : a large set now splits into several lines, if it doesn't fit into the window.
 - 25.1.1997:
 - β 56 : concat strings by adding them.
 - 11.2.1997:
 - β 57 : bugfix: $a^y * a^x$ with $x+y=1$ resulted to 1 . Reported by Michele Berionne.
 - β 58 : bugfix: somehow the `pi` in expressions like $3\pi/2$ got lost...
 - 12.2.1997:
 - β 59 : Texinfo suxx!!!!
 - 6.3.1997:
-

- β 60 : optimized startup window a bit.

Release V0.9 (beta-release) released 9.1.1998

----- NOW IT'S SHAREWARE!!! -----

- 7.5.1997:
 - β 4 : Now uses CGFonts for displaying. Terribly slow, have to rewrite the routines..
 - β 7 : wow, really nice looking brackets ;-)
- 21.6.1997:
 - β 17 : finally kicked out this fuckin' Texinfo! now I'm using my own textprocessing-system 'TeXas'. boring slow but incredibly flexible!
- 7.9.1997:
 - β 25 : One of the biggest problems that you encounter, if you are a coder, is that you are constantly learning new programing techniques. Because if you do so, you don't want to use the old way. I just started coding in C++ (after buying 16MB, so I can use the GCC compiler). This means that it's absolutely impossible for me, to continue writing in ANSI-C. The only possible solution is to rewrite Laplace completely in C++... This may take some time...
- 8.9.1997:
 - β 26 : Can you imagine this: this stupid guy wants to rewrite the whole code of Laplace in C++!! 55000 lines!! I wonder what would happen, if he could direct this work on his physic studies...
- 9.1.1998:
 - β 27 : Oh shit... Three fuckin' month are gone... But here it is... V0.9, ready for release!!!!
- 11.1.1998:
 - β 28 : german error messages weren't up-to-date. Removed files 'Data/Catalogs/deutsch/#?'. Now uses english messages by default.
 - β 29 : rewrote startup window code. Now it's loaded as an external module.
 - β 30 : preferences now support presets. german menus are now available

Release V0.10 (beta-release) released 29.1.1998

- 14.1.1998:
 - β 1 : Changed array() to newarray() . I need array for something else.
 - β 2 : New function genarray() .
 - β 3 : Invented new type system. Changes syntax of procedure declaration, e.g. number p(vector x) { x * x; } .
- 15.1.1998:
 - β 4 : There was an endless loop, when simplifying $1/\sqrt{x}$.
 - β 5 : Startup window now uses AHI for sound replay.
 - β 6 : A plotter is coming... I can see him at the horizon!
- 16.1.1998:
 - β 7 : After a long, long night (I could say 'good morning' to a flatmate...), a basic function plotter is working.
- 22.1.1998
 - β 8 : Startupwindow: AHI kicked out again, now uses datatypes

(which might use AHI, if installed...)

- β 9 : Animated plots!!! Wasn't very difficult, a first version worked after 20mins o' codin'...
- 23.1.1998:
 - β 10 : You may even show multiple plot anims... >KILL YOUR PROCES-SOR!!!!<
- 28.1.1998:
 - β 11 : Well, the plotter seems to work so far, time for a new re-lease...

Release V0.11 (beta-release) released 27.2.1998

- 29.1.1998:
 - β 2 : You can use array(...) for creating arrays again.
- 30.1.1998:
 - β 3 : You can now edit some global plotter settings. These are used, when a new plotter is opened. If you modify some local plot-ter settings, the global settings are updated, too. So you always get the settings of the last plotter, if you open a new one.
- 2.2.1998:
 - β 4 : Restructured internal plotter handling, making further ex-tensions easier.
 - β 5 : Reimplemented image caching for faster display update. Still to be improved.
 - β 6 : Added prompt, seperator thickness and center results to preferences. These were options before, what didn't make sense...
- 3.2.1998:
 - β 7 : Plotter settings for functions (color, precision etc.) are now saved, too.
 - β 8 : You can now remove functions from a plotter in the settings window.
 - β 9 : Added the ability to plot functions $[x(t),y(t)]$, $t=a\dots b$ instead of normal functions $\dots[x,y(x)]$, $x=a\dots b$
 - β 10 : Cool!! Animated Lissajous-figures.
- 4.2.1998:
 - β 11 : Changed syntax of some functions, now using intervals:


```
> genarray(a=1 .. 2, f(a))
> genvector(a=1 .. 2, f(a))
> genmatrix(a=1 .. 2, b=1 .. 2, f(a,b))
```
 - β 12 : Function graph thickness implemented. Currently only 1, 2 or 3.
 - β 13 : New class integral. Currently there are no operations available for it, but numerical integration is comming up next.
 - β 14 : Repaired my shoes... no money for new ones.
 - β 15 : And here it is... Numerical integration. Try something like:


```
> A = integral( x^2, x=0..1 )
> nint(A)
```

 Adjust precision with \$intprec, the higher the better.
- 5.2.1998:
 - β 16 : Now you can use intervals in indeces: $A[2 .. 3, 2 .. 3]$ -> fetch a 2x2 matrix from the bigger matrix A
- 6.2.1998:
 - β 17 : Now generates an error message, if you use arguments for a reference, which is itself an argument, e.g. $f(x) = x(2)$. Thanx

- to Myk Hoole for is bug report.
- β 18 : Cursor is now blinking again...
 - β 19 : Fonts and colors are now updated correctly, when modified in the preferences.
 - β 20 : Display for greek letters in the preferences window used wrong font.
- 16.2.1998:
- β 21 : As reported, the startup window still causes problems. If nothing helps, it can be turned off completely.
 - β 22 : Fixed a bug when displaying things like x^1/a . Reported by Rolf Kabbe.
 - β 23 : Fixed a bug of the vector product. Reported by Sascha Werth.
 - β 24 : It is now possible to export a project as ASCII even without a keyfile. The import function is disabled instead.
- 17.2.1998:
- β 25 : You can set the x-range directly with with `plot()` command:
`plot(f(x), x=a..b)`
- 18.2.1998:
- β 26 : `derive(x ^ x, x)` was wrong. Not the bug reported by Rolf Kabbe, but is report was a hint...
 - β 27 : Simplification of x^{a+1} caused an endless loop. This was the bug reported by Rolf Kabbe.
- 21.2.1998:
- β 28 : Improved syntax of `animate()`, e.g.
`> animate(f(x,t), x=-1..1, t=0..10)`
Intervals are optional.
 - β 29 : Fixed and improved image caching (for buttons and Pierre's face).

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1.2 todo

- Laplace Manual ----- To do -

2) To do

As I said before, this is only an beta version, so there are still some things left to do, before I release the first full version 1.0 of Laplace, but the countdown is constantly running down.

If you have any suggestions, you are invited to send me a note!!

Here is a list of some major things:

- some smaller adjustments of the plotter (function labels, font adjustment).
- use integers of arbitrary length
- export formulas and plotters as PS/EPS or bitmap file.
- complete and update documentation in english and german.
- a whole bunch of small improvements...

And here are some ideas for the beyond-V1.0 future:

- 3D plotter, density-plots, vector-plots and other crazy things.
- symbolic integration (still a hard one, need some more time for it).
- port Laplace to other operating systems (X11, OS/2, Win95, BeOS...).

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1.3 knownbugs

- Laplace Manual ----- Known bugs -

3) Known bugs

If you find a bug, not documented feature etc. don't hesitate, TELL ME. Laplace became a quite gigantic project and consists now of about 55000 line of program code. It is absolutely impossible to keep such an enormous program bug free. Another problem is that Laplace is quite difficult to debug. The GNU debugger GDB would need about 25MB of free memory to load Laplace (I have 16MB and VIRTUAL MEMORY is terribly slow), but the current version doesn't work anyway (GDB is for some reason not able to set breakpoints...). Instead of a source-level debugger, I have to use MONAM, the assembler debugger from the DEVPAC package... did you ever see the internal representation of a C++ label...

Here are those nasty things I know, but didn't manage to remove 'em (for now):

- The startup-window seems to be problematic in some systems. If this is the case on your configuration, it is possible to disable it completely. To do this, you have to modify the file Laplace, which is a small shell-script. Load it to you favorite ASCII-editor and replace the line bin/Laplace by bin/Laplace -q. If you start the installer-script in expert mode, this can be done by the installer-script.
- Rexx port is currently not working, and I don't know, whether I will reimplement it.
- There are still some thing that look like bugs, but are just features that are not yet implemented. I was too lazy, to list them all (and perhaps even forgot them myself), so don't hesitate to report things that do not work as described in the manual.
- Asynchron calculation is still in an experimental state. Not all structures are protected for simultaneous access by different tasks, but I didn't have any problems. I have to check out, if there could be some conflicts.
- Laplace doesn't check for out of memory conditions, it assumes that a memory allocation always succeeds. If an allocation fails, Laplace simply quits, but this leads to a crash, if the allocation routine is called from a sub task.

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1.4 competitors

- Laplace Manual ----- Competitors -

4) Competitors

There are many other math programs for different operating systems, but I will only look at those available for AMIGA. Well most of them are quite professional projects, with lots of studied coders and mathematicians behind, so I cannot compete with them. But just have a look at them.

MAPLEV

Well, what to say about it? I didn't see the AMIGA version, but I know the UN*X version, and I think there are not many differences, at least I think the mathematical functionality is the same.

MAPLEV does almost everything for you, you can think of. Integrals, differential equations, eigenvectors, function plotting etc. If there would not be a small problem, I would have never written Laplace: the price. DM1500.- is a lot of money, which I cannot afford. This was probably the main reason to create Laplace. Although there is a cheaper student version for AMIGA systems, I will continue my work, 'cause it's too much work to be wasted! If the price is not a problem for you, don't hesitate to erase Laplace from your harddisk.

PARI

PARI is a freeware project of the university of Bordeaux, France. It lacks a graphical user interface, but offers some interesting features. The biggest advantage is: it's really fast! PARI's best sides are algebraic calculus, polynomials and power series. On the other side, it is not able to integrate functions other than polynomials. For transcendental functions a Taylor expansion will be integrated, which is at least a good approximation, but it just gives up on broken rational functions. It has a simple function plotter and basic online help, plus a 500k dvi-manual.

PARI is available on AMINET, it's splitted into two files misc/math/gpamiga_1_38_3.lha (binary) and misc/math/pari_1_38_3.lha (source and docs). Versions for other operating system can be found at megrez.ceremab.u-bordeaux.fr (147.210.16.17) and math.ucla.edu (FTP). You can contact the authors via e-mail at pari@ceremab.u-bordeaux.fr.

MuPAD

MuPAD is also free project of the university of Paderborn, Germany. The AMIGA version is still an alpha release and lacks a graphical user interface. It requires an FPU (which I don't own), so I wasn't able to test it. There might be an UN*X version that I can test.

All files related to MuPAD can be found at
 math-ftp.uni-paderborn.de/pub/MuPAD/ (FTP) and
 http://math-www.uni-paderborn.de/MuPAD/ (WWW).

1.5 biography

- Laplace Manual ----- Biography -

5) Biography

Not available now...

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1.6 readme-mui

- Laplace Manual ----- Readme.mui -

6) Readme.mui

This application uses

MUI - MagicUserInterface

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MUI is a system to generate and maintain graphical user interfaces. With the aid of a preferences program, the user of an application has the ability to customize the outfit according to his personal taste.

MUI is distributed as shareware. To obtain a complete package containing lots of examples and more information about registration please look for a file called muiXXusr.lha (XX means the latest version number) on your local bulletin boards or on public domain disks.

If you want to register directly, feel free to send

DM 30.- or US\$ 20.-

to

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Eduard-Spranger-Straße 7
80935 München
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Support and online registration is available at

<http://www.sasg.com/>

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