

L^AT_EX

Volunteer work for the L^AT_EX3 project

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1 Introduction

This is a call for volunteers to help in the development of L^AT_EX3. There are many tasks needing to be done in support of the L^AT_EX3 project which can be worked on concurrently with the development of the L^AT_EX3 kernel. Furthermore, some tasks require special expertise not found among the core programming team. Initial research, analysis, and work on these tasks by volunteers can greatly speed up the process of integrating a number of desirable features into L^AT_EX3. Many of these features can be extensively developed and tested under L^AT_EX2.09 even before the L^AT_EX3 kernel is available.

Therefore we are publishing a list of tasks to the L^AT_EX user community through various channels and we ask readers to consider contributing some time and effort (particularly, but not exclusively, readers with expertise in the various areas touched on). The task list is distributed in the form of a L^AT_EX article; it is fairly readable in electronic form, and it can be printed on paper if desired.

If you are interested in working on a particular task, see Appendix A for details on how to volunteer.

The task list will be updated at regular intervals. For instructions on obtaining a copy from the public archives, see Appendix B.¹

2 General tasks

2.1 Volunteer list management

Organization, publication and maintenance of the general volunteer task list.

List manager: George Greenwade.

2.2 Validating L^AT_EX2.09

Writing test files for regression testing: checking bug fixes and improvements to verify that they don't have undesirable side effects; making sure that bug fixes really correct the problem they were intended

¹ Editor's note: This summary is based on version 5.1 of the task list, dated 15 October 1992. The archived list contains some information not included here, such as time estimates and the names of volunteers other than the task coordinators.

to correct; testing interaction with various document styles, style options, and environments.

We would like three kinds of validation files:

1. General documents.
2. Exhaustive tests of special environments/modules such as tables, displayed equations, theorems, floating figures, pictures, etc.
3. Bug files containing tests of all bugs that are supposed to be fixed (as well as those that are not fixed, with comments about their status).

A procedure for processing validation files has been devised; details will be furnished to anyone interested in this task.

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3 Syntax questions

3.1 .sty metacomments for smart editors

Develop conventions for documentation of styles which could be picked up by editor packages to provide editing help.

The idea is to place metacomments in .sty files which smart text editors (in particular) can use to get information about the 'exported' (user interface) macros for that particular style. The information would be useful for word completion and spelling checking, at least. (The auc-tex package for GNU Emacs currently has such information hard-wired for a number of common styles.) If the editor has access to the `\documentstyle` line or suitable alternative instructions it can poke about in the appropriate style files rather than using its own database.

Such information could be written out by a run with `doc.sty` on the basis of `\Describe {Macro, Env}` commands in the .doc file and subsequently included in the `docstrip`'ped .sty file. That's easy enough, but if it's to be generally useful the result ought to be somewhat standardized and in a form suitable for use by as many editors or other tools as possible.

Would conventions for supplying other information this way be useful (along the lines of the PostScript structuring conventions)?

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3.2 Syntax proposal for bibliographical commands

Extensions of current L^AT_EX syntax for `\cite` commands and bibliography commands. A number of specialties have conventions for citations and bibliographies that L^AT_EX 2.09 is ill equipped to handle.

David Rhead published several papers concerning the handling of bibliographies and citations [Rhe90, Rhe91a, Rhe92a, Rhe92b]. Some of them have been distributed via the `latex-1` mail list. Counter-proposals or further argumentation for David Rhead's ideas would be useful.

Coordinator: Open

3.3 Research on syntax for tables

What features are important (and not covered)? Logical representation of tabular material versus visual representation. Syntax proposal and report.

About tabular material presentation many interesting papers are published. For example, general articles [Bea86, Bea85]; \LaTeX related [Car90, Car91, Rhe91b]; logical table representation [Van92]. Important work was done by Michael Spivak in [Spi89] and of course in his "Tables to die for" (T2D4). Standard books on typesetting ([But81, McL80, Chi82, Whi88], to name only a few) also usually contain important information about tabular typesetting. What is necessary is a survey of the requirements for tabular material in printing, a proposal for an extended standard syntax, and perhaps a proposal for syntax of extra features that could be provided through a separate 'super tables' module that is not loaded until the user requests it.

Coordinator: Ed Szynter `ews@babel.com`

3.4 Research on syntax for chemistry

The typography of chemical texts is rather different from, say, mathematics. We need a taxonomist to classify the primary elements of an article or book on chemistry and suggest syntax for user commands to handle each element. What proportion of chemical diagrams can be constructed with primitive line graphics such as given by the \LaTeX `picture` environment (with suitable extensions)? Or should diagrams just always be done in some other graphics language and imported via `\special`?

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3.5 Research on syntax for commutative diagrams

Commutative diagrams occur often enough in mathematical literature that even the first version of \LaTeX back in 1981 or so included a rudimentary facility for constructing rectangular commutative diagrams. Since then several people have produced various alternatives, most involving special fonts with line segments slanted at various angles, and arrow heads. The commutative diagram macros

of \LaTeX have arrow directions specified as vectors with the units being rows and columns rather than distances, e.g., `\arrow (1,2)` means a diagonal arrow from the current element to the element one row over and two columns down.

There is a `catmac.sty` by Michael Barr that uses the line fonts of \LaTeX for drawing slanted arrows. The `XY-pic` package by Kristoffer Rose is reportedly usable with \LaTeX and comes with its own line and arrowhead fonts.

For \LaTeX3 we would like to see an analysis of the logical structure of commutative diagrams and recommendations on user syntax.

Coordinator: Paul Taylor `pt@doc.ic.ac.uk`

4 Research tasks

4.1 Experimenting with `\emergencystretch`

Testing the new features of \TeX3 where no experience is available so far. Writing up a report.

Research on `\emergencystretch`, in particular, is an important area where the \TeX community doesn't have enough experience so far, e.g., what are good values in what situations, why? What happens if... and so on. This would also make a good article for *TUGboat* if the report were given some finishing touches afterwards.

Coordinator: Open

4.2 Research on indexing commands

What kinds of indexes are needed for various fields? What kinds of indexes are needed for various specialties? What kinds of `\index` commands/syntax need to be provided for marking entries? What kinds of commands need to be provided for printing indexes after they have been processed by a program like `MakeIndex`?

Coordinator: Open

4.3 Research footnote/endnotes conventions

What conventions are used for various specialties? What user commands and syntax would be recommended? Report on the results.

Coordinator: Open

4.4 Syntax diagrams

Designing a command syntax (and implementation in \LaTeX2.09) for syntax diagrams used to illustrate programming language syntax.

Reference: Michael F. Plass, Charting your grammar with \TeX . *TUGboat*, 2(3):39-56, November 1981.

The described syntax is probably not appropriate for L^AT_EX and the implementation needs refinement since it was done for T_EX78 but it is a good starting point.

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4.5 BNF notation

Designing command syntax and prototype L^AT_EX-2.09 implementation for BNF (Backus-Naur) notation used to describe syntax of programming languages.

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5 Research tasks (cont.)

5.1 Research on use of shorthand forms

In SGML there is a concept called 'short ref' which means for example that the double quote character " can be defined to produce directional quotes, blank line can be interpreted as end of paragraph, and so forth.

What kind of similar shorthand forms in ASCII files may be desirable for L^AT_EX users, e.g., => to be converted to ⇒, /= or <> to be converted to ≠, ' ? to be converted to upside-down Spanish question mark, "u to be converted to umlaut ü, and so forth. What conventions are currently in use for various kinds of documents?

Something along these lines is currently done in A_MS-T_EX with the @ character: @- is a shorthand meaning 'nonbreaking hyphen', @, is a shorthand meaning one-tenth of a thinspace, @> is a shorthand for an extensible right arrow, and so forth.

It is envisioned that in L^AT_EX3 the user will be allowed to designate certain characters to be shorthand initiator characters. For efficiency reasons, the set of allowed initial characters will probably be restricted to nonalphanumeric only.

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5.2 Research on figures and captions

What rules are in common use for placement and formatting of floating figures and their associated captions? Propose syntax for user commands. Write report.

Placement rules for floats and their captions are so far very limited in batch formatters like T_EX. We are interested in rules for such placement which are used in practice, algorithms, and possible user syntax. What could be a good user syntax for putting captions above, below, on the side, centered or top or bottom or left or right? Do we need to allow dif-

ferent action for different classes of floats? What do we need for multi-figure groups and their captions?

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5.3 Research on the use of ^^ conventions

Check the actual use of the ^^ convention for special characters in the L^AT_EX community by polling as many users, organizations, mail-lists, usenet groups, etc., as possible. Write report.

In T_EX the ^^ notation is sometimes used for access to unusual characters (< 32 or > 126). It would be useful to separate this function from the superscript function by assigning it to some character other than ^, if that would not be too large an inconvenience for users. One approach, for example, would be to change ^ and _ to be active characters so that they can always keep track of current math style, which would allow a better definition for \mathchoice and simplify many things having to do with math fonts. It seems that the ^^ notation is indispensable only when the character is used in a control sequence name or as a macro argument delimiter (or in hyphenation patterns?). Note: document styles are of less concern since they will have to be mostly rewritten for L^AT_EX3 anyway.

Coordinator: Open

5.4 Research on typographic conventions and requirements in multilingual environments

Typographic conventions differ from one language/country to another. Collect information about such conventions and try to identify the basic data-types and operations required in L^AT_EX3, so that most or, ideally, all features necessary for the support of many languages can be implemented in the L^AT_EX3 programming language.

It would be helpful also to include anything whose provision is already supported by the babel system and/or other systems: e.g., hyphenation.

Coordinator: Open

6 Miscellaneous items

6.1 Math font handling

Test math font handling in the latest release of NFSS and write up detailed comments.

Last year there was some discussion among the L^AT_EX3 programmers and others on how to handle math fonts under an enhanced release of NFSS for L^AT_EX3. The discussion finally drifted off into areas that are far beyond the scope of the L^AT_EX3 project but the actual questions that were raised have not

yet been answered. The only contribution that came close was the detailed suggestion and experience report by Sebastian Rahtz about the alpha release for an extended text font handling which was sent around via the latex-1 list.

A related, but separate, subtask involves thinking about proper math font handling taking into account the papers already sent around.

Coordinator: Open

6.2 Converting numbers to textual form

Currently counter values can be displayed in certain styles, e.g., as roman numerals. But it may be interesting to extend the available commands by cardinal and ordinal representations, e.g., 5 → ‘five’ or ‘fifth’ (for example, if you wanted to refer to ‘the fifth item’ in a list using something like L^AT_EX’s \ref). Spivak’s L^AM_S-T_EX has \cardinal and \ordinal macros to do this, for handling cross-references such as ‘the fifth item in the list’ where ‘fifth’ is supposed to be generated by a \ref command. The main question: How much do we need this capability? Should it be standard, or merely a nice option for those who want it? Can it be easily extended to support various language conventions? Are there other significant uses besides the cross-reference idea?

Coordinator: Open

7 Miscellaneous items (cont.)

7.1 Rewrite MakeIndex in WEB

Convert/rewrite the C source code of MakeIndex. For consistency it would seem desirable to have all auxiliary programs designed for use with L^AT_EX3 to be compilable in the same way as T_EX. Currently this means use of the WEB language, with or without the CWEB intermediate step.

Furthermore, the MakeIndex program could use some work to deal with a few shortcomings that have become evident with the passing of time and extended usage.

Coordinator: Open

7.2 Write other auxiliary programs

Create programs for support tasks related to L^AT_EX documents but not part of the primary typesetting functions.

Question: what other auxiliary programs do we need? Conjectures: Compiled version of docstrip? Programs to help designers in creating document styles? Program for dealing with graphics files in various formats (e.g., read Bounding Box comments from a PostScript file and compute scaling

and translation numbers for passing to a L^AT_EX \special command)? Checksum utility by R. Solovay for updating Nelson Beebe’s standardized file headers. Auxiliary program to help in constructing complicated tables (decimal point alignment, row spanning, other fancy effects that are hard to do in T_EX currently)? Auxiliary program similar to Type & Set to do interactive page-breaking/float placement?

Coordinator: Open

7.3 Bibliography style programming

Write bibliography styles for BIB_TE_X1. The current version of BIB_TE_X is 0.99. A reimplementaion of BIB_TE_X for L^AT_EX3 is under way, by Oren Patashnik. When this is finished, or perhaps even before, suitable standard bibliography styles for L^AT_EX3 need to be written.

Pending because of status of BIB_TE_X1

7.4 Bibliography style requirements

Collect available BIB_TE_X0.99 styles and, if possible, further journal and publisher requirements regarding bibliographies and analyze them. Summarize the functionality of each style, whether or not it is easily programmable with the current BIB_TE_X, what special functions would be helpful, etc.

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7.5 Survey of existing L^AT_EX style options

Using David Jones’ TeX-Index (and any other useful sources), evaluate the status of the many L^AT_EX2.09 options currently available, e.g., whether they are up-to-date, whether the authors still support them, or if unsupported, whether they are interesting enough to make it worthwhile to seek a new maintainer for them.

Write a report indicating the status of each style option, a short description of its features and, if it is not maintained, if you think it is worth upgrading or maintaining it.

TeX-Index is an index of (L^A)T_EX macros. From its documentation:

The most recent version is always available by anonymous FTP from theory.lcs.mit.edu in the directory pub/tex/TeX-index.

Copies can also be obtained from the following locations:

archive.cs.ruu.nl TEX/DOC/TeX-index.Z

ftp.th-darmstadt.de pub/tex/documentation/
styles-and-macros.Index.Z

ftp.math.utah.edu pub/tex/tex-index