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Preface

The value of a body of knowledge depends very much on whether it is accessible; more precisely, on how well it is accessible. Very roughly the value of 46 volumes of The Journal of Logic Programming (JLP), representing 509 articles, is practically zero if it is just standing on the shelves in the library, and one has no way to selectively find information in it. One potentially valuable tool is a comprehensive index. Here are (subject and author) indexes for volumes 1–46 of the journal JLP, in which precisely 509 articles appeared. Please note that The Journal of Logic Programming changed its title to The Journal of Logic and Algebraic Programming from volume 47 onwards. This index covers all volumes published under the old title.

Other similar indexes are planned; for instance in algebra. There already exist indexes for the first 200 volumes of Theoretical Computer Science (some 42 000 terms),[1] the first 89 volumes of Artificial Intelligence (some 18 000 terms),[2] the first 91 volumes of the Discrete Applied Mathematics (some 20 500 terms),[3] the first 200 volumes of Discrete Mathematics (some 60 000 terms),[4] and the first 75 volumes of Information Processing Letters (some 30 000 terms).[5] These are the first steps in an attempt to build up an adequate (controlled and standardized) *phrase vocabulary* for mathematics and computer science. A dictionary of *words* is of but very limited use for information retrieval purposes in science (as can already be guessed from the numbers just quoted).

The numbers behind the key phrases in the index itself refer to the 509 articles that have appeared in these 46 volumes (there are some empty numbers). They are numbered in more or less historical order. This volume also contains the thus numbered list of these articles giving author(s), titles, volume numbers, and page numbers. There are a few gaps in the numbering sequence; that is just the result of the procedure that assigns numbers to articles and does not mean that there are any articles missing; the list is complete.

The index was generated from titles and abstracts only (and keywords, in the low percentage of cases that these were available; these author supplied key phrases were usually far from adequate to describe the article in question).

There are some 6100 different 'index phrases' and some 9400 'citations' (= reference numbers), for an average of about 1.5 citations average per index phrase. That is reasonable for this type of index which is in first instance for human use (as opposed to computer

[1] Theoretical Computer Science 213/214 (1999) 1–659.
[2] Artificial Intelligence 96 (1997) 1–302.
[3] Discrete Applied Mathematics 106 (2000) 1–261.
[4] Discrete Mathematics 227/228 (2001) 1–648.
[5] Information Processing Letters 78 (2001) 1–448.

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use), but a bit on the low side, perhaps reflecting that the field is in vigorous development and not very well settled in terms of standard terminology. Meaningful single words, like 'algorithm' occur quite frequently in the material at hand. They are of little use to (computer-less) humans but have been retained. But they have not been separately cited if they also occur in a cited compound phrase.

The index is 'reference-complete' in the following sense: if a phrase occurs in the index then all occurrences are listed, taking account of such obvious linguistic variations as occurred, unless the phrase was part of a larger index phrase. It is also reference-complete in the sense that it has been tested against the 129 000 item phrase list of all the previously made indexes (see above) together.

I also believe that this index is pretty much complete as regards meaningful phrases from Logic Programming. One way to try to judge completeness of an index for a given field is on the basis of a simple stochastic model that is briefly explained in [6]. The saturation phenomenon that that model predicts (for a currently complete index; most scientific fields continue to grow; and this one is growing fast) seems to start being present in the case of the present index, suggesting that this index goes some way towards completeness. How far is hard to say. Precise statistical tools for judging such matters are being developed. [7]

Let me make a few remarks on the lexicographic ordering that has been used. Basically, that one is: numerals first, then funny symbols like %, &, #, \, etc., (space) and (tab), punctuation signs and quotation marks, various kinds of brackets and slashes, and then the alphabet itself; (space) comes before (hyphen). Upper case and lower case letters and letters with diacriticals are basically folded together; more precisely, by way of an illustrative example, part of the ordering sequence is: c ç D d E É e é è ê ë F f and another part is A Á À Ä Ã Å a á à â ä ã å Æ æ B b. This means, by way of an example from Discrete Mathematics, that 'Fan' (a proper name) comes before 'fan' (a technical concept) but that 'fan' comes before 'Fan condition'. E.g.

Fan 2374, 3626, 3693, 4943, 5042, 5294
fan 3747, 4453
fan argument 5158
Fan condition 5906
Fan condition for Hamiltonicity 3693
fan sequence 1759
Fan type condition 3838

Mathematical symbols are usually largely ignored in an index like this (partially because the various fonts that are available order very differently). In the present case practically none occur except ∞ and a few Greek letters. The glyph ∞ falls somewhere between 9 and A, and the Greek letters are treated as if they were written out: thus α is treated like alpha, ϕ like phi, etc.

When looking for something like '*P-complete', look just after 'P-complete'.

The hyphen is at the end of the sorting order. Thus to find something like 'p-selective', or 'P-complete', look at the very end of the items in the section 'P'.

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[6] Michiel Hazewinkel, Topologies and metrics on information spaces, CWI Quarterly 12(2) (1999) 93–110.

[7] Institute of Mathematics and Informatics, Lithuanian Academy of Sciences, Vilnius, Lithuania. Paper (Hazewinkel, Rudzkis) to appear in Acta Appl. Math. (2001).

A reasonable amount of effort has gone in identifying and lumping together linguistic variations and spelling differences. Thus of singular and plural versions just one occurs in the index with the singular preferred if that made sense. If both American and English spellings occur a *see also* reference directs the user to orthographic variants; thus, for example: 'colorable, *see also* colourable'. Hyphenated versions and 'written together versions' have been treated similarly. For instance 'fixpoint', 'fixed point', 'fixed-point', 'fix-point', with, in this case, 'fixed point' preferred. In my opinion, hyphens are used far too much in scientific writing.

However, there certainly remain quite a few instances of phrases that occur separately, are further apart linguistically, but really have the same mathematical meaning.

Most items start with a lower case letter. The exceptions are: acronyms (all capital letters), proper names (initial upper case letter), names of programs, computer languages, ..., such as Prolog, Algol, Scheme, Cell (initial upper case letter); of course in the case of Scheme and Cell the lower case versions can also occur separately as technical concepts.

If a concept name derives from a proper name an upper case letter is used; for instance 'Abelian', 'Boolean'. In compound words this leads to the use of hyphens as in 'anti-Horn expression'.

Like the various other indexes already mentioned, this one is a first attempt, an offering to the community, to be used, criticized, improved, and enlarged.

Michiel Hazewinkel
E-mail address: mich@cwi.nl
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