

A THOROUGHLY DEMONSTRATIVE MATHEMATICAL ARTICLE USING \LaTeX

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ABSTRACT. We indicate the means by which one may construct both snazzy-looking titles in \LaTeX , suitable for submission to honest-to-goodness math journals, *and* automatically cross-referencing bibliographic citations and entries.

1. SNAZZIFICATION

Now that you've had a chance to start playing with \LaTeX , you might want to know about a couple of built-in tools that'll help make a math paper look all professional-like:

- (1) The command “`\maketitle`”, and
- (2) automatic bibliographic indexing.

Let's take 'em one at a time, shall we?

2. MAKING A TITLE

The command “`\maketitle`” enables to you input the following data concerning your paper, compile it all, and output it in the format demonstrated on this here first page:

- (1) “`\title`” This first command allows you to input a title. If you look at this raw text file, you'll notice that there are two “options” included with this command. The first, in square brackets, is truly optional; the text included here (in this paper, “A short title”) is called the “running title” that appears at the top of odd-numbered pages. Usually this is included if your actual title is too long to look nice (or even fit) at the top of individual pages. If you omit this optional option, the command just uses the actual title, included in curly braces, as the running title, too. As you can very well imagine, the actual title is the one that's splayed largely across the front page, as above.
- (2) “`\author`” Here's where you give yourself credit. Again, you've got the option of including a longer, standard, name to appear on the first page, and an optional “running title” sort of name that'll appear at the top of every even-numbered page. Generally I make this the same as my full name, though you could make it just your last name, or your last name with first initial (like “P. Bahls”), especially if you're writing a multi-author paper. For multiple authors, you'll need to include a separate “`\author`” command for each author.
- (3) “`\address`” This command correctly paginates the mailing address you want to include, generally your home department's address. (Note the rather sparse information I included

2000 *Mathematics Subject Classification*. XXXXX.

Key words and phrases. demonstrations, MATH 280, \LaTeX , general silliness.

The author was supported by an NSF-sponsored REU grant provided to the University of North Carolina, Asheville during the writing of this paperlet.

above.) If you're writing a multi-author paper, you'll add an `"\address"` command for each author separately, each one placed after the corresponding `"\author"` command.

- (4) `"\email"` This command works just like the previous one. I'll let you figure it out.
- (5) `"\keywords"` This is the first command that might seem a wee bit puzzling. "Keywords" are any words (or short combinations of words) that sum up the topic covered by your paper. These words end up getting used by databases like MathSciNet and MathReviews to allow folks to search for your paper on-line, so you'll wanna make sure the words you choose are descriptive and relevant. Generally you'll include anywhere from one or two to perhaps five or six words or phrases.
- (6) `"\subjclass"` This command refers to the *MSC Subject Classification* code, consisting of two digits, then a letter, then two more digits, that defines the topic or topics covered by your paper. For example, 20XXX is group theory, 05XXX is combinatorics, 06XXX is order theory, and so forth. A more refined example would be 05C40, which refers to graph connectivity. I'll show you how to track down the correct codes if you ever need to do so. Note that when the command is entered (as above), I've included an "optional" option in brackets: the "2000" here refers to the date of the classification schema being used. Right now it's best to use 2000, though they'll be updating it in 2010, I was just informed.
- (7) `"\abstract"` The *abstract environment*, much like a theorem environment or proof environment, allows you to create an automatically-formatted abstract, a brief encapsulation of your results, your proof techniques, and your applications.
- (8) `"\thanks"` This command enables you to provide formal acknowledgment of support, generally either institutional or financial.

Once you've got all of those commands in place, you can wrap it all up nicely with the command `"\maketitle"` itself, which puts it all together and spits it out, as you see above. Swanky, no?

3. AUTOMATIC BIBLIOGRAPHIES

So you've written your paper, but in doing so you've torn your hair out over your references: numbering them, making the citations in the body look nice, including a well-structured bibliography at the end...you've had it!

Help is on its way: with the *"thebibliography" environment*, referencing is a snap.

Let's say you really need to refer to the ground-breaking work on orderability written by me and an old REU student of mine from the University of Illinois, Tyler Smith. In the text of your paper, what you'd want it to say is "Bahls and Smith, in [1], introduced the idea of..." Here, the "[1]" refers to the order in which the reference is given in the bibliography (something taken care of automatically, no need to juggle those indices!). This citation is generated by the command `"\cite"`. With the understanding that within the "thebibliography" environment at the end of the paper (see the raw text file that generates this document) we've given our paper the label "bahlssmith", all we have to do whenever we want to refer to this paper is type `"\cite{bahlssmith}"`. The numbering is taken care of for us, all is well: check it out!

As you note when you examine the raw text for this document, there's nothing too complicated about "thebibliography" itself. (By the way, don't worry about that weird "99": just include that, and you should be fine.) For each reference you've included, include the tag `"\bibitem"` along with the corresponding label you chose for that item, and then include your reference. The command `"\textsc"` puts text in the "small capitals" face, commonly used for titles of papers, chapters, and sections, and for authors' names in bibliographies, the boldface and italics commands you've seen

already. The two references I've included below are given in a pretty standard bibliographic form for mathematics sources, so if you copied this style, you'd be safe: the first is a journal article, and the second is a book.

Happy writin'!

REFERENCES

- [1] BAHLS, P. and SMITH, T.G., "Rewriting systems and orderings on Artin monoids," *Internat. J. Algebra Comput.* **17** (2007) no. 1, 61–75.
- [2] MAGNUS, W., KARASS, A., and SOLITAR, D., *Combinatorial group theory*, Dover, 1976.

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