# An Introduction to TeX and LaTeX:

# Lecture 3: Sense and sensibility

Thursday 2 November 2017

- A remark that is nothing to do with TEX
- Hyphens and dashes
- Stops
- Correct use of symbols
- Some suggestions about style

# Nothing to do with TEX

**Good practice:** ensure that all your work has

- title,
- author (yourself),
- date.

For a long work, such as a dissertation, a version number can also help you to know where you have reached with your revisions.

# Hyphen and dashes

Do not confuse or misuse hyphen -, en-dash –, em-dash —.

Hyphens are used if a word has to be broken at line end;
also used in compound adjectival phrases made from nouns as in
'a white-knuckle ride', 'a red-nosed reindeer';
also in double-barrelled names such as Heath-Brown and
Swinnerton-Dyer.

En-dash is used for ranges such as 1984–2009 or pp. 123–254.
Type two adjacent hyphens -- in TEX.

Em-dash is a form of punctuation used—much as parentheses
are—to mark off certain kinds of subordinate clauses.
Type three adjacent hyphens --- in TEX.

# More on en-dash

Mathematicians have acquired a habit of using en-dash to create eponymous names for theorems, conjectures, and the like: the Schröder–Bernstein Theorem; the Cantor–Schröder–Bernstein Theorem.

[To me this seems daft: to use what looks like a minus sign instead of & or +.]

In recent years I have seen authors go a step further and use a construction that makes no sense at all: 'the theorem of Cantor–Bernstein' or 'the conjecture of Birch–Swinnerton-Dyer' and even 'Birch–Swinnerton-Dyer's conjecture'.
In this context the conjunction MUST be 'and' or '&'.

# Stops

Full stop (period in American English) and abbreviation stop are typographically different.

Typographical convention expects extra space after a full stop and before the start of the following sentence, and TEX inserts such space automatically.

For an abbreviation stop, as seen in the works of D. E. Knuth for example (compare D. E. Knuth), we type `.\` or we use protected space (tie) by typing `.\~` if we wish to inhibit line-breaking after the stop. Or use thinspace by typing `\,`

# Correct use of symbols, I

**In mathmode we have all the correct symbols for mathematics: do not use the wrong ones. Compare**

$$| < a, b | a^2 = b^2 = (ab)^3 = 1 > | = 6 \quad \textbf{and} \quad e^{iy} = cosy + isiny.$$

**with**

$$|\langle a, b \mid a^2 = b^2 = (ab)^3 = 1\rangle| = 6 \quad \textbf{and} \quad \mathrm{e}^{\mathrm{i}y} = \cos y + \mathrm{i} \sin y.$$

# Correct use of symbols, II

- **Never use $<$ $>$ as angle brackets. As binary relation symbols they come with spaces fore and aft. Use `\langle` `\rangle` which give the genuine brackets $\langle$ $\rangle$.**

- **Use `\mid` for 'such that' in contexts such as $\{x \in \mathbb{R} \mid x^2 < 2\}$: it is spaced correctly, whereas vertical bar is not. (Or change your style and use colon $\{x \in \mathbb{R} : x^2 < 2\}$)**

# Correct use of symbols, III

- **Functions such as log, exp, cos, sin, max, min, are always printed in roman type in formulae. Use** `\log`, `\exp`, `\cos`, `\sin`, `\max`, `\min`, **and other such commands that are built into TEX.**

- **Functions like Hom, Aut, End, Tor, Sym, Alt should likewise be printed in roman type in formulae, as in**
  $\mathrm{Aut}\,(\mathrm{Alt}\,(n)) \cong \mathrm{Sym}\,(n)$.
  **For most of theseTEX does not have built in commands. Either use** `\mathrm` **each time or make definitions such as**
  `\newcommand{\Aut}{\mathrm{Aut}}`.

# Style, I

A selection of the advice written in about 1980 by the London Mathematical Society editors of the time, much of it still to be found on the LMS publications website:

- Mathematics should be written in grammatically correct language and should be properly punctuated, even in sentences that include formulae or displayed material.

- Words such as 'assume', 'suppose', 'show' and 'imply' should usually be followed by 'that'.

- Where 'if' introduces a conditional clause, it should usually be followed by 'then', as in 'if $x = 3$ then $y = 4$'.
  This is essential where omitting 'then' would result in juxtaposition of formulae, as in 'if $x = 3$, $y = 4$'.

# Style, II

Adjectives should not usually be used as nouns.

For example, ‘a unitary’ should not be used when what is meant is ‘a unitary operator’.

It is particularly obnoxious to use proper names such as Frobenius, Sylow as ordinary nouns by taking their eponymous adjectival uses and dropping the noun as in
‘(the) Frobenius’ for ‘the Frobenius automorphism’ or
‘a Sylow’ for ‘a Sylow subgroup’.

Even worse is to use a proper name as an adjective without its noun, as in ‘we see that $(s_n)$ is Cauchy and therefore converges’.

# Style, III

Sentences should begin with words rather than symbols; it is particularly bad to start a sentence with a lower case symbol.

This holds especially when the preceding sentence ends with a formula or symbol, so that two formulae could apparently coalesce to make one which, at first reading, is nonsense.

Formulae should never be separated by punctuation marks only, except in lists.

Try to avoid having quotation marks, reference citations or footnote symbols adjacent to formulae.

Never use 'apostrophe s' for plurals—as in $x_i$'s.
For the possessive with symbols use 'of'.

# Style, IV

Use abbreviation sparingly. Mathematical writing is already very concentrated.

Do not use ‘e.g.’, ‘i.e.’, ‘s.t.’ adjacent to formulae.

Never use symbols such as $\Rightarrow$, $\forall$, $\exists$ as lazy abbreviations in text.
The abbreviation ‘iff’ is best avoided in print.
The full form ‘if and only if’ is easier to read (and looks less like a misprint).

Avoid the use of symbols such as $=$, $<$ as abbreviations in text.
The scope of such binary relation symbols should be made clear: usages such as ‘The number of prime divisors of $30 = 3$’ are unnecessarily disturbing.

# Enough already!

Enjoy making professional mathematical text.

May your essays, reports, dissertations, articles give pleasure to you and to your readers.