

General writing skills in English

5 March 2013

Technical Writing

Technical writing is a *different style* of writing prose than

- letter writing
- newspaper journalism etc.

BUT as in letter writing, it requires correct spelling and grammar!

Rules

Every rule about the English language has an exception, and not all experts agree on the rules!

The rules we discuss today are all designed to either

- help you avoid ambiguity in your writing, or
- to produce a lively and attractive writing style.

Spelling

Several ways of spelling words: e.g. British, American and Australian.

British: *colour, centre, theatre*

American: *color, center, theater*

Why not use Australian spelling?

The Manual of Style published by the Australian Government recommends to spell as in the Macquarie Dictionary.

Spell-checkers

On our Linux system **spell** (which has an option -b for British spelling) or **ispell**.

- teach spell-checkers words
- ispell lists alternatives
- they miss mistakes:
 - **ten** instead of **then**
 - the noun **practice** instead of the verb **practise**.
 - **form** instead of **from**.
 - **an** instead of **and**.

Good advice: have a friend proof-read your document for spelling/grammar.

Active Voice

Write in **active voice**:

"X did Y"

instead of in **passive voice**:

"Y was done by X".

Active voice:

- more lively
- adds movement to your text
- less formal and less distant.

Examples

Example

No agent Two of these algorithms have been shown to terminate.

Passive Two of these algorithms have been shown by Jones [2] to terminate.

Active Jones [2] has shown that two of these algorithms terminate.

Example

Passive The answer was provided to sixteen decimal places by Gaussian elimination.

Active Gaussian elimination gave the answer to sixteen decimal places.

Passive Voice

Look out for “was performed”, “was computed”, and “was calculated” as they are usually in the passive voice.

Every rule has exceptions and occasionally the passive voice is appropriate, if you want to change the emphasis to the sentence.

Example

A recursive version of this algorithm was given by Hudson [2] in 1985. – emphasis on the recursive version.

Hudson [2] gave a recursive version of this algorithm in 1985. – emphasis on Hudson.

How should you refer to yourself?

I showed ... We showed ...

The author showed ... It was shown ...

- Use “we” for “me and the other authors of this paper” or “the reader and me together” .
- In a thesis, perfectly acceptable to use “I” .
- In a paper by a single author, it is more common to find expressions of the form “this paper introduces the hypothesis that ...”, but can be ambiguous.
- Generally, “I” is avoided in technical writing.

Which Tense?

Be consistent. **If in doubt use the present tense.**
Choose **present tense** as main tense of writing,
even when referring to later parts of a document.

This is proved in Theorem 3 below.

Sometimes the **past tense** is used to refer to earlier
parts of a document, e.g.

We showed in Section 4 ...

Tense again

Always refer to tables or figures in the **present tense**.

When specifying a reference it is a good idea to use the **present tense**, e.g.

Reference [3] contains a result ...

When referring to results of a particular list of authors you can use either **present or past tense** as in the following example:

Banach shows (or showed) ...

Capitalisation

Names and words derived from names are capitalised, e.g. Gaussian elimination.

The words **theorem**, **lemma**, ... are not capitalised:

In the next theorem we prove a better bound.

Except when referring to a specific theorem or section:

Theorem 3 is proved in Section 4.

Avoiding ambiguity

Sentences should be readable from left to right without ambiguity.

Bad sentence:

Balga residents fed up with criminal activity in their suburb have supplied the addresses and car registration numbers of people they claim are buying and selling illicit drugs to the Stirling council and police. (Subiaco Post).

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Pronouns such as “it” and “they” can lead to confusion. Instead, give names to quantities and use those names.

Avoiding ambiguity

Does $\sin^{-1} \alpha$ mean $\arcsin \alpha$ or $(\sin \alpha)^{-1}$?

Does $x/3y$ mean $x/(3y)$ or $x/3 * y$?

Make sure it is clear which one you mean! (with context)

Dangling participles

The participle of a verb needs correspond to the appropriate noun.

Example

Referring to your **email**, **I** write to inform you that
...

The participle is “referring”, qualifying the noun “email”, and its intended subject (agent) is “I”.

Dangling participles

Bad example

Replacing a for x , the **formula** becomes
 $a(a - 1) = 0$.

The agent is “formula” and the participle is “replacing”.

The substitution is done by the reader, not the formula!

Ad Break

STUDYsmarter is organising workshops on writing skills.

Some grammar sessions in weeks 3, 4, and 5.

Drop-in sessions from 10am to 12pm daily in the Collaborative Study Area in the Reid Library. Bring your notes, drafts, etc for advice.

Check their website studysmarter.uwa.edu.au.

Distinctions: To alternate, alternative.

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To **alternate** means to move repeatedly between two things, whereas an **alternative** represents one of many options.

Example

There are many **alternatives** available for implementing this algorithm, one involves **alternating** between the minimum and maximum values in the search.

Distinctions: Compare with, compare to.

You will generally want to use **compare with** in technical writing, when analyzing similarities and differences between things.

Compare to states a resemblance between things, and usually has a poetic touch.

Example

Shall I compare thee **to** a summer's day?

Compared **with** an English summer, an Australian winter merely has shorter days.

Distinctions: Less, fewer.

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Less refers to a quantity, whereas **fewer** refers to a number.

Example

There are **fewer** oranges than apples, although the apples are **less** tasty.

Distinctions: Compose, comprise, constitute.

To **compose** means to make up, **to comprise** means to consist of. **Constitute** is a transitive verb used in the reverse sense of the other two.

Example

This course is **composed** of 13 lectures. This course **comprises** 13 lectures. Thirteen lectures **constitute** this course.

“Comprised of” is always wrong, say “consisted of”.

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Comprise and **include** are also often confused.

Include = admission or presence of an item, no presumption that all or even most of the components are mentioned in the list.

Comprise = lists all the items making up the whole.

Example

The Faculty **comprises** six Schools, **including** the School of Maths and Stats.

Distinctions: That, which.

That defines and restricts. **Which** informs and does not restrict.

Example

- 1 Consider the lattice L **that** is complete.
- 2 Consider the lattice L , **which** is complete.

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- 2 Consider the lattice L , **which** is complete.

In 1, from a collection of lattices, focus on a particular L , one that is complete.

In 2, extra information is being given about this particular lattice: it is complete.

Which-clauses are set off by commas, and the **which** refers to the word right before the comma.

That

Do not omit the word “that” when it helps the reader parse the sentence.

Example

Instead of *Assume p is a program*,
write *Assume that p is a program*.

Conversely, never say “we have that” or “because of the fact that”. Both introduce unnecessary padding.

Contractions

Avoid contractions, e.g. write *do not* instead of *don't* or *cannot* instead of *can't*.

Plural nouns

Certain nouns are plural nouns, e.g.

data, media, criteria, phenomena.

Their singular forms are

datum, medium, criterion and **phenomenon.**

Punctuation

- A **comma** “,” is a punctuation mark of the least separation indicated between parts of a sentence.
- A **semi-colon** “;” is used as the chief stop of intermediate value between a comma and a full-stop. It separates two or more related clauses.

Punctuation

- A **colon “:”** separate two clauses when the phrase before the colon is general and the phrase after it is particular. A colon is used especially to mark antithesis, illustration, or quotation.
- A **full stop “.”** marks the end of a complete sentence, containing a subject, object and finite verb.
- A **new paragraph** generally marks a change of subject.

Punctuation: use of commas

When the subject is the same for both clauses in a sentence, and the subject is expressed only once, then no comma is needed.

Example

Knuth's writings are entertaining and full of interesting examples.

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Example

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When the subject is expressed once more, use a comma.

Example

Knuth's writings are entertaining, and they are full of interesting examples.

Punctuation: use of commas

When the subject is the same for both clauses and is expressed only once, a comma is useful when the connective is but.

Example

Knuth's writings are entertaining, but are lacking in interesting examples.

Punctuation: use of commas

Place a comma before a conjunction (and, but, for, nor, yet, or, so), introducing an independent clause.

Example

Bad The network modeled the behaviour of the brain and the digestive system was completely ignored.

Good The early data have disappeared, and it is no longer easy to reconstruct the results.

Remember sentences should be readable from left to right without ambiguity.

Punctuation: use of commas

In a series of three or more items with a single conjunction, use a comma after each item except the last (serial comma).

Example

- Red, white, and blue are the colours of the Australian flag.
- Work done independently by Jones, Lee and Tsui, and Forkaras [18,22,3] demonstrates that this problem is NP-complete.

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Punctuation: use of commas

If a list contains commas within the items, ambiguity can be avoided by using semi-colons as the list separator.

Example

The data include binary, floating, and complex images; integers and reals; and arrays of images.

Punctuation: use of commas

Enclose parenthetical expressions between commas.

Example

The best way to use this computer, unless you are playing games, is with keyboard data entry.

Punctuation: use of commas

Use a colon after an independent clause to introduce a list of particulars, an antithesis, an illustration, or a quotation.

Example

A dedicated programmer requires three skills: touch typing, critical analysis, and the ability to survive on little sleep in a malnourished state.

Punctuation: use of stops

Stops are used to end sentences, but are also used in abbreviations, acronyms, and ellipses. When these occur at the end of a sentence, the sentence's stop is omitted.

Example

- This algorithm runs for 10 secs.
- A proof by induction does not consist of proving the base case, then the case of $n = 1$, then the case of $n = 2, \dots$ It uses a much more sophisticated form of logic.

Punctuation: quotes

A punctuation mark is embedded within quotation marks only if it was used in the original text, such as when a complete sentence is being quoted.

Example

Marr [2] argued that “biological vision systems are an inspiration for computer vision”, although Faugeras [12] disagrees: “Computer vision should focus on solutions to engineering problems; it should not be restricted by biological implementations in its search for optimal algorithms.”

Adjectives and adverbs

Adjective an attribute added to the name of a thing to describe the thing more fully.

Adverb word that modifies or qualifies an adjective, verb or other adverb, expressing a relation of place, time, circumstance, manner, etc.

Adjectives

Use an adjective only if it is necessary, to add information.

Bad example

The calculation should be written up with meticulous care.

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Resist the temptation to use long strings of nouns as adjectives.

Bad example

We now study the complexity of the communication network null-hypothesis accumulation algorithms.

Adverbs

Try to avoid adverbs like very, rather, quite, nice and interesting in technical writing.

Bad example

The proof is **very** easy. This is an **interesting** algorithm.

Rhythm

Sentences have a definite spoken rhythm - always read aloud what you have written and change the wording if it does not flow smoothly.

More spelling

Even spelling checkers won't find semantic errors, and the following words are commonly misspelt or misused by computer scientists.

complement	not	compliment
principle	not	principal
stationary	not	stationery
implement	not	impliment
occurrence	not	occurence
auxiliary	not	auxillary
feasible	not	feasable
referring	not	refering
editing	not	editting
category	not	catagory

More spelling

consistent	not	consistant
analogous	not	analagous
dependent	not	dependant
preceding	not	preceeding
discrete	not	discreet
affect (verb)	not	effect (noun)
in practice	not	in practise
descendant	not	descendent
maxima (plural)	not	maximum (singular)
schemata (plural)	not	schema (singular)
phenomenon (singular)	not	phenomena (plural)
its (belonging)	not	it's (it is)

Style Manuals

The Australian Government Style Manual

recommends setting all Latin abbreviations in roman:

cf.	<i>confer</i>	compare
e.g.	<i>exempli gratia</i>	for example
et al.	<i>et alii</i>	and others
etc.	<i>et cetera</i>	and so forth
i.e.	<i>id est</i>	that is
inf.	<i>infra</i>	below
NB	<i>nota bene</i>	take careful note
non seq.	<i>non sequitur</i>	it does not follow
PS	<i>postscriptum</i>	postscript
sup.	<i>supra</i>	above
v.	<i>versus</i>	against