This class completed our discussion of usage. We discussed common usage pitfalls and the issue of gender-specific pronouns. We also covered acronyms, time, numbers, ordinals, and lists. The notes here are organized by topic and do not appear in the order they were covered in class.

1 Usage pitfalls

1.1 The word only

Only modifies what appears immediately after it. You should carefully consider its position to give your sentence the intended meaning. Sentences a, b, c, and d below have very different meanings.

a. Only we concentrate on finding the running time.
   (Among all sentient beings, we alone concentrate on finding the running time.)

b. We only concentrate on finding the running time.
   (We just do one thing—concentrate on finding the running time.)

c. We concentrate only on finding the running time.
   (When we are concentrating, we are doing that on one thing—finding the running time.)

d. We concentrate on finding only the running time.
   (When we concentrate on finding something, that item is definitely the running time.)

1.2 The words proved and proven

Proved is the past tense of the verb prove. Proven is an adjective; it means tried-and-true.

The theorem was proved using the proven technique of substitution.

1.3 Words beginning with non

Words beginning with non are typically not hyphenated unless the word after non contains hyphens or starts with an uppercase letter:

- *Wrong*: non-negative
- *Right*: nonnegative
- *Right*: nonvolatile
- *Right*: non-dynamic-programming
- *Right*: non-Windows
1.4 The difference between continuous and continual

A continuous event progresses without interruption. Continual means regularly repeated but not without interruption.

- The computer draws power continuously.
- The computer continually checks to see whether a mouse event has occurred.

1.5 Pluralization

The plural of vertex is vertices. The plural of index is indices in math and indexes in other cases.

We swap the indices $i$ and $j$.

CLRS has the best of all indexes ever published.

Append an x to pluralize an abbreviation or number. Do not add an apostrophe.

- Wrong: CPU’s
- Right: CPUs
- Right: 0s
- Right: 1s

2 Gender-specific pronouns

A thief robs a store. He wants to take the most valuable items that fit in his knapsack.

In the example above, we are forced to assign the thief a gender because English lacks a pronoun for a singular-third-person-human. To refer to multiple thieves, we have a gender-neutral pronoun—*they*. If the thief was not human, we could have used *it*. People commonly use *they*, as a singular pronoun, to get around this problem. That approach, however, can confuse the reader or convey an incorrect meaning altogether. The following sentence uses *they* incorrectly:

If the user types cd ~; rm –rf *, they will lose all their files.

We referred to one user using *they*. It is also confusing—the reader might think that some group, other than the user, will lose files as a consequence of the user’s action.

The traditional method is to always use the male gender. It is hard to go wrong with that. Always using the female gender is also an option. Oh! Pascal!, a book from Berkeley, does just that. Dupré suggests alternating genders of characters. Some people use constructions such as *s/he, he/she, and his/her*. Tom and the Chicago Manual of Style prefer phrases such as *he or she, him or her*, and *his or hers* over words with slashes in them. Even these phrases should be used sparingly and only after exhausting less obtrusive options.

Biased language can distract readers, offend them, and make the work appear less credible. Drawing attention to the absence of linguistic bias can also distract and weaken credibility. We need to ask ourselves whether technical writing is a place where we should deal with linguistic bias. Tom thinks that, at least in the case of computer science, not using male pronouns exclusively can help women feel more welcome to the field.

You might use an article instead of a pronoun:
A patient who develops the described rash on the hands should inform the doctor

Tom thought that on the hands does not sound right. Matt brought up that it is common, in medicine, to say things like cirrhosis of the liver and cancer of the lungs.

People have made several proposals for a new gender-neutral pronoun but none have seen widespread use. Williams thinks that eventually they will become the norm. Tom does not like that solution and recommends not to use they in writing he will see.

Both the traditional usage and newer gimmicks can weaken credibility with some readers. Alas, there is no clear solution.

3 Abbreviations and acronyms

We use the Parallel Disk Model (PDM) proposed by Vitter and Shriver.

Abbreviations and acronyms should be defined at the first use, except for standard abbreviations such as MIPS, MHz, GB, and sec. Which abbreviation can be considered standard will depend on the field and target audience.

Correct capitalization of the letters in an abbreviation is important:

- 16 MB = 16 megabytes
- 16 Mb = 16 megabits

Even when referring to the plural form, an unit’s abbreviation should not be followed by an s; also, remember to put a space before the abbreviation:

- Right: 16 MB
- Wrong: 16 MBs
- Wrong: 16MB

Do not put periods in acronyms.

- Wrong: A.C.M.
  Right: ACM
- Wrong: I.E.E.E
  Right: IEEE

Anup brought up the acronym for United States—U.S. That acronym is an exception where periods are put in.

The sound of an acronym, and not its first letter, will decide which article will precede it:

For a large matrix, we can send data over a LAN when computing an LUP decomposition.

Here we would say “lan”; because what we say begins with a consonant sound, precede it with a. But we would say “ell-you-pee”; because it starts with a vowel sound, precede it with an.
4 Writing time

There is no single correct way to write time.

- **Better:** 2:30 PM
- **OK:** 2:30 P.M.
- **Bad:** 2:30 P.M. (Dupré’s suggestion. Hard to typeset.)
- **OK:** 2:30 pm (Tom has started using this)
- **OK:** 14:30 (The reader must know that it is in 24 hr format)
- **OK:** 14h30 (The French way)

5 Numerals

A sentence should not start with numerals:

- **Wrong:** 32 nodes constitute the cluster.
- **Right:** Thirty-two nodes constitute the cluster.
- **Better:** The cluster contains 32 nodes. (most coherent)

When a number is followed by a unit of measure, use digits:

- **Right:** The cable is 3 meters long.
- **Right:** It took only 6 seconds to compile the program.
- **Right:** Using threads made columnsort run 2 times faster.
- **Wrong:** Each node has four gigabytes of RAM.
- **Right:** Each node has 4 gigabytes of RAM.
- **Right:** Each node has 4 GB of RAM.

Use numerals when you are referring to the digits themselves. Do not spell out in cases like this:

In $a_{12}$, the 1 gives the row number and the 2 gives the column number.

Use numerals when talking about section numbers and the like: Section 3, Figure 5, Theorem 2, step 4. Values after a dollar sign should be written in numerals: $\$686$.

Ordinals such as first, second, and third can either be spelled out or written using numerals followed by abbreviated suffixes: 1st, 2nd, 3rd. Do not put suffix abbreviations in a superscript.

When an expression with a variable forms an ordinal, remember to pick the correct suffix. Use th if it is just one variable or if the expression ends with a variable. Otherwise, the suffix depends on the number that ends the expression. The following examples show correct usage:

- nth
- $(x + y)th$
(x + 1)st
(x + 2)nd
(x + 3)rd
(x + 4)th

Numbers in the same series should be consistently spelled out or written using numerals:

- Wrong: We ran the program on four, eight, and 16 nodes.
- Right: We ran the program on 4, 8, and 16 nodes.
- Right: We ran the program five times on 4, 8, and 16 nodes.

In that last example, five is not part of the series 4, 8, and 16, and so we do not have to use the digit 5.

When deciding whether to spell out a fraction or not, replace the fraction with an integer and think whether you would spell out the integer in that position.

- Wrong: I used only 1/2 of the cluster.
- Right: I used only one-half of the cluster.
- Right: I used only half of the cluster.

The rule about units of measurement applies to fractions as well:

- Wrong: The cluster has one-quarter of a terabyte of RAM.
- Right: The cluster has 1/4 of a terabyte of RAM.
- Right: The cluster has 1/4 TB of RAM.

6 Lists

6.1 In-text lists

An in-text list is one that runs in-line with your text. The following example contains an in-text list.

The memory system contains (1) registers, (2) caches, (3) RAM, and (4) disks.

Items within an in-text list should not be full sentences. If you want an in-text list of full sentences, start each with an ordinal and write them as full sentences.

The program might be slow for the following reasons. First, cache misses cause memory accesses. Second, communication is over 10 Mb Ethernet. Third, I/O calls block.

Parenthesize each number of an in-text list and do not use periods. Use the serial comma rule for list items. Do not use a colon just because you are inserting a list. If the sentence is grammatical without a colon then do not use a colon. Dupré advises against using letters and roman numerals in in-text lists but Tom thinks it is OK.

Wrong: The running time depends on 1) computation, 2) communication, and 3) I/O.
Wrong: The running time depends on 1. computation, 2. communication, and 3. I/O.
Right: The running time depends on (1) computation, (2) communication, and (3) I/O.
6.2 Displayed lists

Displayed lists stand out as blocks. Here is an example of a displayed list that is part of a sentence:

The memory system contains

1. registers,
2. caches,
3. RAM, and
4. disks.

Items can either be full sentences or not; consistency is important—if one list item is a sentence then they should all be so:

The program might be slow for the following reasons:

- Cache misses cause memory accesses.
- Communication is over 10 Mb Ethernet.
- I/O calls block.

Dupré says that displayed lists should not have punctuation. Tom disagrees. In his opinion a displayed list might be be part of a sentence and thus have punctuation. The last and can sometimes be skipped though:

The running time depends on

- computation,
- communication,
- I/O.