

Regular Lecture 6

Punctuation, Part 1

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Generalities

Punctuation Marks

The main punctuation marks are

- ▶ **periods;**
- ▶ **question marks;**
- ▶ **exclamation points;**
- ▶ **colons;**
- ▶ **semicolons;**
- ▶ **commas;**
- ▶ **long dashes;**
- ▶ **short dashes;**
- ▶ **hyphens;**
- ▶ **slashes;**
- ▶ **apostrophes;**
- ▶ **quotation marks;**
- ▶ **parentheses;**
- ▶ **ellipses.**

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- ▶ **parentheses;**
- ▶ **ellipses.**

Commas and hyphens are more difficult and kept for the next lecture.

The Role of Punctuation

The main goals of punctuation are **clarity** and **comprehensibility**. Many punctuation rules directly serve these goals, but some can also seem arbitrary.

Even following the arbitrary rules ultimately serves clarity, because readers will parse your sentences faster and more reliably if you follow the **established conventions**.

Easy Punctuation Marks

Periods

Periods (.) (also called “full stops” in British English) appear

- ▶ at the **end of sentences**;
- ▶ in some **abbreviations** (e.g., *e.g.*, *Dr.*, *U.S.*).

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Avoid multiple question marks in a row—e.g.:

How come there is a memory leak??

Avoid question marks in parentheses—e.g.:

Lisp was invented around 1960 (?) by John McCarthy.

Exclamation Points

Apart from their mathematical uses (e.g., $n!$), exclamation points (!) have virtually **no place** in formal writing. You can be emphatic without using them. Compare:

This is still the case when postprocessing after every step!

The current definition of `fib` does not terminate!

Try to think of this as a stimulus to further investigation!

Frustratingly, this is still the case when postprocessing after every step.

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Frustratingly, this is still the case when postprocessing after every step.

Shockingly, the current definition of `fib` does not terminate.

Try to think of this as a stimulus to further investigation.

Avoid multiple exclamation points in sequence, and avoid exclamation points in parentheses. Compare:

The information is stored in an unordered (!) pair.

Notice that the information is stored in an unordered pair.

Colons

You can use a colon (:) after a complete clause instead of a period (.) if the clause **introduces** what follows—e.g.:

There are three paint primary colors: red, yellow, and blue.

An explanation suggests itself: The training data set is heavily biased in favor of easy problems.

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Capitalization of what follows the colon is slightly tricky:

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Some authors use colons extensively. Others never use them.
The “editor” should ensure a uniform style.

Colons

In scientific and technical writing, a colon is frequently used between a sentence and **displayed material** such as a standalone equation or a code fragment—e.g.:

The following code swaps the contents of two variables:

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temp = a  
a = b  
b = temp
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```

When the displayed material is part of the sentence, no colons should be used. Both colons below are wrong:

To achieve thread-safety, we need to replace:

```
public void calculate()
```

with:

```
public synchronized void calculate()
```

Colons

Finally, a colon is used **between a title** and **a subtitle** in running text or reference lists—e.g.:

*Lambda, the Ultimate TA: Using a Proof Assistant to Teach Programming Language Foundations*¹

*Guarded Kleene Algebra with Tests: Verification of Uninterpreted Programs in Nearly Linear Time*²

¹Benjamin C. Pierce, *ICFP 2009*, pp. 121–122, ACM, 2009.

²Steffen Smolka, Nate Foster, Justin Hsu, Tobias Kappé, Dexter Kozen, and Alexandra Silva, *Proceedings of the ACM on Programming Languages* 4(POPL), pp. 61:1–61:28, 2020.

Semicolons

Semicolons (;) can be used as “**lightweight periods**” between sentences that belong closely together. Often, the joined sentences exhibit parallelism—e.g.:

Thanks to computer algebra systems, working mathematicians are no longer spending their time performing tedious calculations; simulation tools bring similar benefits to physicists.

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Semicolons are more common in English than in most other languages.

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Semicolons

Semicolons can also be used as “**heavyweight commas**” for separating items in an enumeration when the items themselves already contain commas—e.g.:

We reserve the letters f, g, h for functions; m, n for natural numbers; and s, t, u for terms.

Long Dashes

Long dashes (—) are very versatile.

They can be used instead of commas or parentheses to indicate a **longer pause**—e.g.:

General relativity is hard to understand—and even harder to explain.

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When using short dashes for number ranges, beware of redundant constructions such as *between 1789–1914*. (Change to *between 1789 and 1914* or *1789–1914*.)

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Slashes are **clumsy** and generally best avoided in formal writing. Compare:

The support desk should respond to tickets in a rapid/timely manner.

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If/when the handle is closed, the resource is returned to the operating system.

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When the handle is closed, the resource is returned to the operating system.

It is almost always best to replace the construction *X and/or Y* by one of

- ▶ *X and Y*;
- ▶ *X or Y*;
- ▶ *X, Y, or both*.

Slashes

Exceptionally, slashes are unobjectionable when used to separate lines of **poetry** or **song lyrics**—e.g.:

*Do I contradict myself? / Very well then I contradict myself, /
(I am large, I contain multitudes.)*¹

¹Walt Whitman, *Leaves of Grass*, 1855.

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Apostrophes are also used to form the **possessive**—e.g., *writer's*, *writers'*.

Beware of the **grocer's apostrophe**. The plural of *tomato* is *tomatoes*, not *tomato's*.

Quotation Marks

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In British English, double and single quotation marks are exchanged.

Quotation Marks

Quotation marks are also used with **informal expressions** or **slang**, although this is not recommended—e.g.:

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Finally, do not use quotation marks for emphasis. Use italics or bold.

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Entire sentences, including the period, can be in parentheses. This is usually less distracting than footnotes—e.g.:

... of the array. (The [] operator returns the element at a given index.) This definition ...

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Avoid **clusmy devices** such as *file(s)* and *police(wo)man*.

Generally avoid **nested parentheses**. Compare:

Metis relies on six derivation rules (Hurd (2003)).

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Ellipses

Ellipses (...) can be used to indicate the **omission of material** in quotations. For example,

“Point-to-point reachability is arguably the simplest model-checking; property it asks whether a program can reach a given target state from a given initial state.”¹

can be shortened to

“Point-to-point reachability . . . asks whether a program can reach a given target state from a given initial state.”

¹Julian Müllner, Marcel Moosbrugger, and Laura Kovács, “Strong Invariants are Hard: On the Hardness of Strongest Polynomial Invariants for (Probabilistic) Programs,” *Proceedings of the ACM on Programming Languages* 8(POPL), pp. 882–910, 2024.

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Ellipses are useful when you **omit words** in the middle of a quotation.
As a rule, there is no need to put ellipses at the beginning or end of a quotation.
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Finally, ellipses are used in mathematics for **finite sequences** (e.g., $x_1, \dots, x_n$) and **infinite sequences** (e.g., $x_1, x_2, \dots$). If the ellipsis coincides with the end of the sentence, the result is four evenly spaced periods—e.g.:

The process gives rise to a sequence of time stamps $t_0, t_1, t_2, \dots$