In this lecture we continue talking about usage. The following are words and expressions that are commonly misused.

1. *All right* consists of two words.

2. *Alternate* vs. *alternative*:
   *Alternate* means every other one in a series or a substitute. *Alternative* means one of two possibilities or choices.
   
   A walk in a graph has no alternative but to take alternate vertices and edges.

3. *Between* vs. *among*:
   *Between* is for two things. *Among* is for three or more things.
   
   The records are distributed among four disks.
   The system switches between two states.

4. *Anybody* and *anyone* are written as one word.

5. Instead of *as to whether*, just write *whether*.

6. Instead of *as yet*, just write *yet*.

7. *Can* vs. *may* vs. *might*:
   *Can* is used for ability. *May* is used for permission. *Might* indicates doubt.
   
   *Right:* I can tell you that you may leave at 2:50.
   *Wrong:* I may pass this class.
   *Right:* I might pass this class.

8. *Compare to* vs. *compare with*:
   *Compare to* is for when you compare two things that are different in nature to show a similarity. *Compare with* is for when you compare two things that are similar in nature to show how they differ.
   
   Reagan was compared to Teflon. [Reagan was a U.S. president and Teflon is a chemical, but nothing sticks to either one.]
   Compared with Carter, Reagan was more decisive. [Both Carter and Reagan were U.S. presidents, but they differed in how decisive they were.]

9. *Comprise*:
   Don’t use *comprise* in passive voice. Just remember “the whole comprises the parts.”
Wrong: This class is comprised of graduate students.
Right: This class comprises graduate students.

10. **Data**:  
Technically, *data* is the plural of *datum*. Strictly speaking, *data* should be used only as a plural.

The data were distributed over four disks.

But we have come to view *data* as a collective noun, like *crowd*. If you use *data* as a singular noun, hardly anyone will complain.

11. **Different from vs. different than**:  
This one is simple: *different than* is *always* wrong. Use *different from*.

12. **Effect vs. affect**:  
*Effect* means to cause to happen. *Affect* means to influence.

The Curriculum Committee effectuated reforms in the graduate curriculum that affected all the new graduate students.

13. Avoid using *etc.* It is usually redundant. If you use it in a phrase beginning with *such as* or *for example*, you’ve already established the notion that what you’re listing is a proper subset.

*Bad*: We talked about primitive types such as int, double, char, etc.

If you do use *etc.*, typeset it in roman, not italics, even though it’s from the foreign phrase *et cetera*.

14. **Farther vs. further**:  
*Farther* refers to distance. *Further* refers to time or quantity.

As I went further into my education, I lived increasingly farther from my parents.

15. One good meaning of *fix* is to make firm.

Once we fix a value for the radius, we can compute the area.

16. **Hopefully** is an adverb meaning *with hope*. It is usually wrong to use it at the beginning of a sentence to mean *it is hoped*.

*Wrong*: Hopefully, we’ll determine whether P = NP.

*Right*: The computer science community hopes that someone will determine whether P = NP.

17. **However** can refer to a small contradiction, or it can mean *in whatever way*. It’s best to not use *however* at the beginning of a sentence for this meaning. You get a better rhythm by using it in the middle of a sentence or even at the end. It’s OK to start a sentence with *however* when it means *in whatever way* or to *whatever extent*. In the first three of the following examples, *however* refers to a small contradiction. In the last example, *however* means *in whatever way* and to *whatever extent*. 
Bad: I was late. However, I brought beer.

Good: I was late. He was glad to see me, however, because I brought beer.

Good: I was late. I brought beer, however.

Good: However you write a program, it won’t solve the halting problem. However many times you try, you won’t succeed.

18. Infer vs. imply:

Infer means to deduce from evidence. Imply is to suggest the truth of existence of something.

Since \( b = a \mod n \), we may infer that \( b < n \).

Having \( b = a \mod n \) implies that \( b < n \).

Another way to think of it is that if I imply something, then you infer it.

19. Inside vs. inside of:

You may use inside of to mean less than. Otherwise, use inside.

Inside of an hour, the virus made its way inside thousands of computers.

20. Fewer vs. less:

Fewer refers to discretely countable things. Less refers to things that are not discretely countable.

My laptop has fewer gigabytes of RAM than the cluster, and therefore it has less memory.

21. Like vs. such as:

Like refers to example that is not a member of the set. Such as refers to example that is a member of the set.

I use object-oriented languages such as Java.

There are no modern languages like COBOL.

22. Like vs. as:

Like is used for nouns. Such as is used for verbs.

Wrong: Your program runs like my program does.

Right: Your program runs as my program does.

Right: Your program runs like the wind.

23. Use left and right double-quotation marks. For quotations within double-quotation marks, use left and right single-quotation marks.

Priya corrected me when she said, “‘Columnsort’ does not begin with ‘k.’”.

You can use quotation marks to refer to a string, but it’s better to just use another typeface such as italic or typewriter.

24. Double quotation marks can be used to show irony.

OK: The “fast” program turns out to be slower than the “slow” program.

Bad: The “fast” program takes almost no time at all. [There is no irony here.]
25. Quotation marks and other punctuation:

- For commas and periods, the U.S. style and the British style differ. The U.S. style puts commas and periods inside the quotation marks, regardless of context.
  
The error messages were “null pointer exception,” “array index error,” and “stack overflow.” [The commas and period didn’t actually appear in the error messages, but they need to be in the sentence, and so they go inside the quotation marks.]
The British style puts commas and periods inside the quotation marks if they’re part of what’s being quoted, and outside otherwise.
  
The error messages were “null pointer exception”, “array index error”, and “stack overflow”.
The British style is logical. But it looks bad to have the space underneath the quotation marks along the baseline. Tom prefers the British style, but because we’re in the U.S., we use the U.S. style.

- Colons and semicolons go outside the quotation marks, regardless of context.
  
The error message was “null pointer exception”; this message was more helpful than “segmentation fault.”
  
Windows offers the following “advantages”: difficulty of use, bugginess, and security holes.

- Exclamation marks and question marks go inside or outside, depending on the logical context.
  
The first section is titled “Why Study Out-of-Core Sorting?”
  
Why did you call the second section “Out-of-Core Sorting for Dummies”? 

26. *Literally* means *in the exact way*. It is better to avoid using it because many people do not know its meaning.

27. Avoid using *nice* unless you’re referring to the UNIX command or the city Nice in France (which doesn’t come up in computer science often).

28. *Nor* is like *or* but used with *neither*.

  *Wrong:* The set of integers does not contain the rationals nor the reals.
  *Right:* The set of integers contains neither the rationals nor the reals.

29. Avoid using *one* to denote a generic person.

  *Bad:* One must take care not to divide by zero.
  *Good:* Do not divide by zero.

30. *One of the most* is an expression that tells nothing. Don’t use it.

31. Avoid using *firstly, secondly, thirdly*, and so on. Use *first, second, and third*.

32. *Shall* vs. *will*:
  
In formal writing use *shall* for first person and *will* for second and third person.
  
According to Strunk and White, *shall* expresses the speaker’s belief, and *will* expresses determination or consent.
A swimmer in distress: I shall drown; no one will save me!
A suicidal swimmer: I will drown; no one shall save me!

Dupré suggests that you use *shall* when writing about what comes later in your manuscript, because by the time the reader gets to the later part, it is no longer subject to your will. *Will* implies intention—a creature’s will should be involved. “Will is much stronger than shall.” Use *will* when you are writing a proposal. “You are contracting to do the work, so you should sound as though you intend to carry it out.”

Tom added that in some cases, using *shall* can be stronger, because it removes volition, stating cause and effect as though it were a matter of physics, as in the following example.

If you don’t write this program, I shall break both your legs.

33. Don’t use *so* as an intensifier: *so large, so fast.*

34. Split infinitives (*to (adverb) (verb]*) are more accepted than they used to be. But it’s still good to try to avoid them.

*OK:* to correctly use LaTeX

*Better:* to use LaTeX correctly

35. *That* vs. *which*:
Simply put, *that* is restrictive, and *which* is not.

The program that computes pi to a trillion places ran for five days. [Of all the programs, only the one that computes pi to a trillion places ran for five days.]

The program, which computes pi to a trillion places, ran for five days. [The program ran for five days. By the way, said program computes pi to a trillion places.]

If you remove a *that* clause, you destroy the original meaning. If you remove a *which* clause, you leave the meaning intact. Do not set off *that* clauses by commas. You should set off *which* clauses by commas.

Another trap: *which* refers to whatever word precedes the comma before the *which*.

*Bad:* I dropped my laptop, which was clumsy. [Asserts that the laptop was clumsy.]

To determine whether to use *that* or *which*, ask yourself the following questions:

- Does the clause identify the object under discussion (*that*), or does it merely add information (*which*)?
- Does the clause pick out one among possibly many like objects (*that*), or is there only one such object under discussion (*which*)?
- Does the clause contribute information critical to the meaning of the sentence (*that*), or is the contribution more of a parenthetical remark (*which*)?
- Should the clause be written without commas (*that*) or with commas (*which*)?
When you write a paper, use the search feature of your editor to go which-hunting so that you can remove all the “wicked wiches.”

It is OK to use which in a restrictive clause if it closely follows that.

We found that the sorting algorithm which is oblivious ran faster than expected.

36. You might be tempted to write the foreseeable future in the Conclusions section of a paper. Don’t.

37. This, that, These, and some:

   Try not to use any of these words as a full noun phrase. Instead, put a noun afterward.

   I asked Priya to work harder. This proved to be a mistake.

   This what? Asking Priya to work harder? Priya actually working harder? The work produced by Priya because she worked harder?

   If you are tempted to use this or that as a full noun phrase, stop yourself and answer the question “This what?” or “That what?” and insert the answer after this or that.

   Just as one is bad for a generic person, some is bad as a set of generic people.

   Bad: Some say that P = NP.


38. Replace this means that by thus or and so.

   Bad: In Java, all objects come from the heap; this means that destructor methods are unnecessary.

   Good: In Java, all objects come from the heap; thus, destructor methods are unnecessary.

   Good: In Java, all objects come from the heap, and so destructor methods are unnecessary.

39. Try takes the infinitive (to (xmpverb)) and should never take and.

   Bad: Try and prove that P = NP.

   Good: Try to prove that P = NP.

40. Use very sparingly. Mark Twain wrote

   Substitute “damn” every time you’re inclined to write “very”; your editor will delete it and the writing will be just as it should be.

41. While refers to time or duration. Many people use it to mean and, but, or although. But it’s best to reserve while for time or duration, especially in computer science, where while as a programming keyword conveys a specific meaning of duration.

   Geek joke:

   A programmer’s spouse sends the programmer him to the store and says “get some bread, and while you’re there pick up some eggs.” The programmer never came back.

   Here is a bad use of while:
Bad: While most theoreticians believe that $P \neq NP$, a handful think the opposite.

Under the strict interpretation of while, this statement asserts that during those time periods in which most theoreticians believe that $P \neq NP$, a few others believe that $P = NP$. We have no idea what this radical fringe thinks during those time periods in which most theoreticians do not believe that $P \neq NP$. It would be better to write the sentence as one of the following:

Good: Although most theoreticians believe that $P \neq NP$, a handful think the opposite.

Good: Most theoreticians believe that $P \neq NP$, but a handful think the opposite.

Another good substitute for while is whereas:

Bad: Loops execute multiple iterations, while selection statements execute once.

Good: Loops execute multiple iterations, whereas selection statements execute once.

Good: Whereas loops execute multiple iterations, selection statements execute once.

Here are correct uses of while:

The FG software makes it easier to write a program that uses the CPU while disk accesses occur.

While I was at MIT, Tip ONeill retired from Congress.

42. So vs. so that vs. such that:

So means therefore. So that means in order that. Such that means in such a way that.

There was a solar storm, so communication lines failed. [therefore communication lines failed.]

We use multiple disks so that we can increase bandwidth. [in order that we can increase bandwidth.]

Priya’s calls to MPI were such that she used only synchronous routines. [in such a way that she used only synchronous routines.]

Tom tends to avoid such that except in mathematical writing:

Let us consider the first vertex $y$ along $p$ such that $y \in V - S, \ldots$

In the following example it is better to use and so than so.

OK: No single data structure works well for all purposes, so it is important to know the strengths and limitations of several of them.

Better: No single data structure works well for all purposes, and so it is important to know the strengths and limitations of several of them.