

Prolegomena unit outline:

- ▶ Algorithms and correctness (Wednesday and **today**)
- ▶ Algorithms and efficiency (all next week)
- ▶ Abstract data types (Mon, Jan 23)
- ▶ Data Structures (Jan 25 and 27)

Today:

- ▶ Finish check-sorting problem
- ▶ “Binary search” problem
- ▶ Class invariants (`LinkedList`)
- ▶ How to succeed in this course

What good are invariants?

- ▶ They are a tool for reasoning about the state and progress of an algorithmic process
- ▶ They are a way to explain the meaning of a variable and capture how the variables relate to each other.
- ▶ They help with testing and debugging.
- ▶ They are a means for proving that an algorithm is correct.

Invariant (Class LinkedList)

- (a) $\text{head} = \text{null}$ iff $\text{tail} = \text{null}$ iff $\text{size} = 0$.
- (b) If $\text{tail} \neq \text{null}$ then $\text{tail.next} = \text{null}$.
- (c) If $\text{head} \neq \text{null}$ then *tail* is reached by following $\text{size} - 1$ next links from *head*.

How to succeed in CSCI 345:

- ▶ Know your DMFP and Programming II stuff.
- ▶ Read the textbook.
- ▶ Do the practice problems.
- ▶ Figure out the quiz questions.
- ▶ Do the projects on time.
- ▶ Use the project to understand the data structures and algorithms—don't just fiddle with the code until the tests pass.
- ▶ Keep electronic devices away during class.

Coming up:

*Due **Wednesday Jan 18** (class time)*

Read Section 1.2 (long section—spread it out)

Do Exercises 1.(6 & 7)

Take quiz

*Due **Friday, Jan 20** (end of day):*

Read Sections 1.(3 & 4) (spread out)

Do Exercises 1.(17-19)

Take quiz