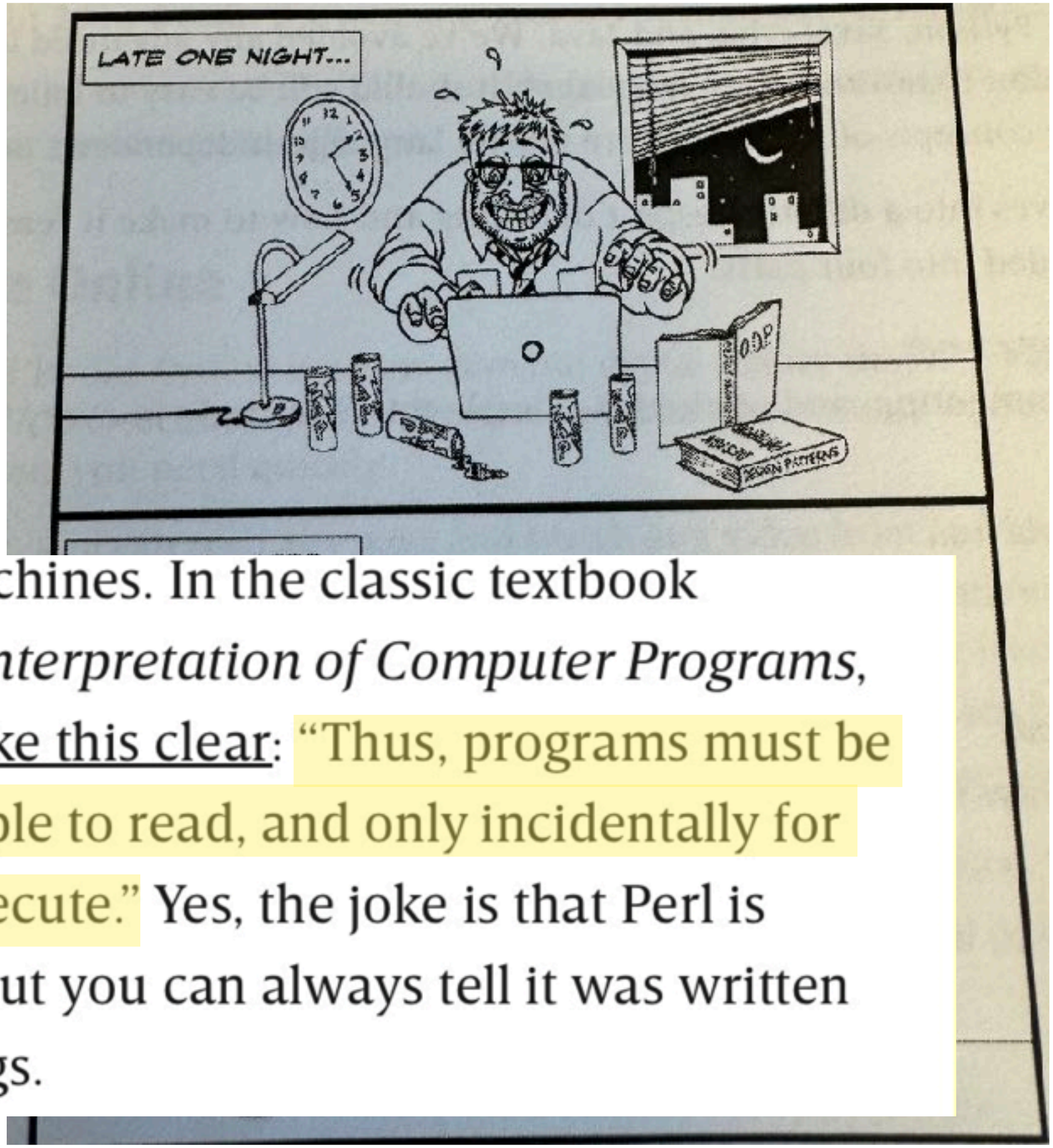
Naming, Comments, and Readable Code

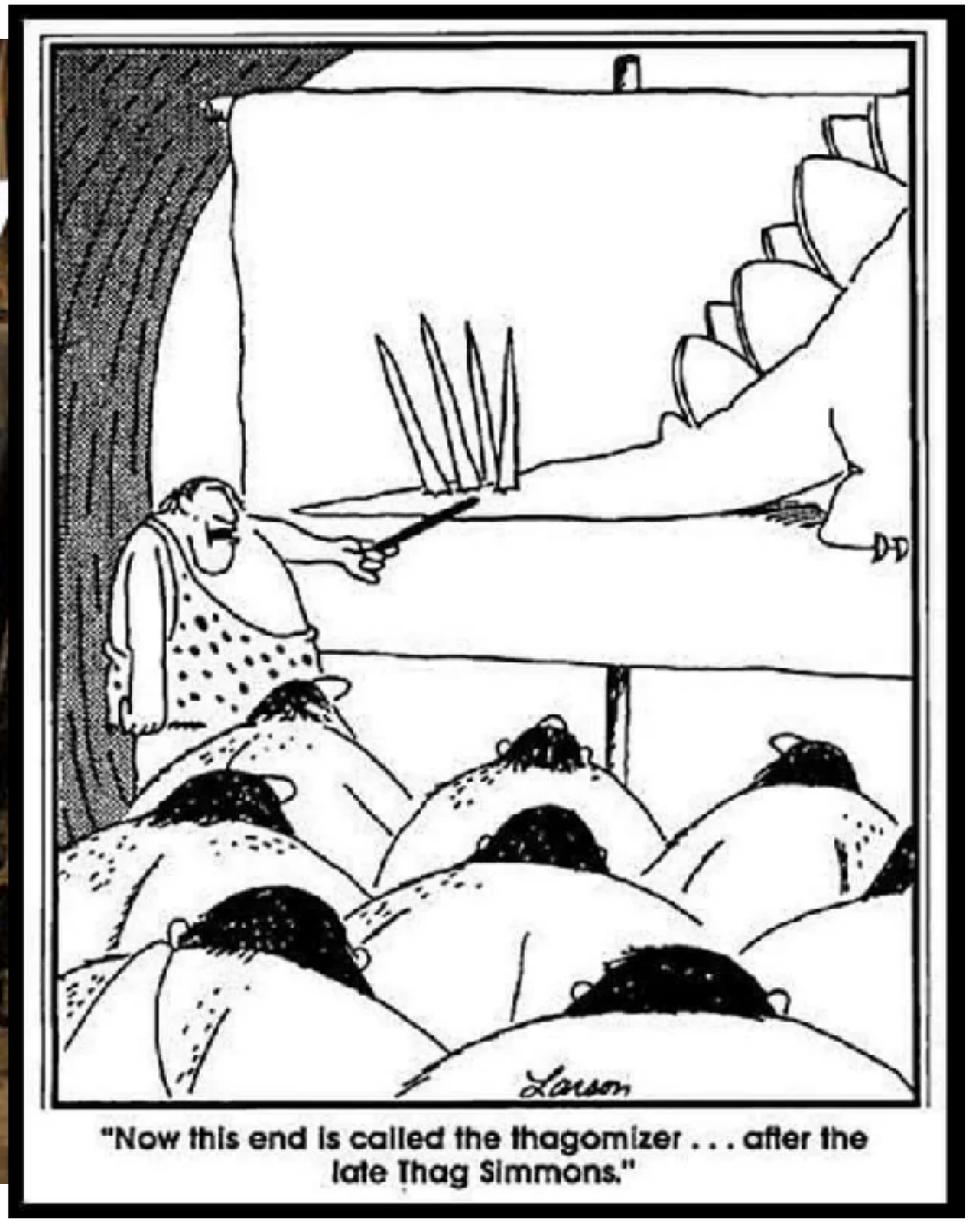
CSCI 4448/5448: Object-Oriented Analysis & Design

Code will be read more than it is written. Including by you!



parsable by machines. In the classic textbook *Structure and Interpretation of Computer Programs*, the authors make this clear: "Thus, programs must be written for people to read, and only incidentally for machines to execute." Yes, the joke is that Perl is "write-only"—but you can always tell it was written by human beings.

Names Are Important



iClicker Question

What does this function call return? Select all that apply

```
def f(w):
  v = []
  for a in w:
    y = 0
    for x in a:
      y += x
    v.append(y)
  return v

f([[1, 2, 3], [10, 20, 30], [100, 200, 300]])
```

A. A list of lists

B. An integer

C. [666]

D. [6, 60, 600]

Names Matter

```
def sum_lists(lists_of_numbers):
    sums = []
    for num_list in lists_of_numbers:
        sum = 0
        for integer in num_list:
            sum += integer
        sums.append(sum)
    return sums

sum_lists([[1, 2, 3], [10, 20, 30], [100, 200, 300]])
```

[6, 60, 600]

Names

```
public class Room {
    private int xVal; // x coordinate of room

public int getRoomX(){
        return xVal;
    }
}
```

```
    ArrayList<Integer> cX = new ArrayList<>();
```

```
public ArrayList<Integer> getCreatureX(){
    ArrayList<Integer> cX = new ArrayList<>();
    for(Creature creature : creatures){
        cX.add(creature.getRoom().getRoomX());
    }
    return cX;
}
```

Nothing wrong here

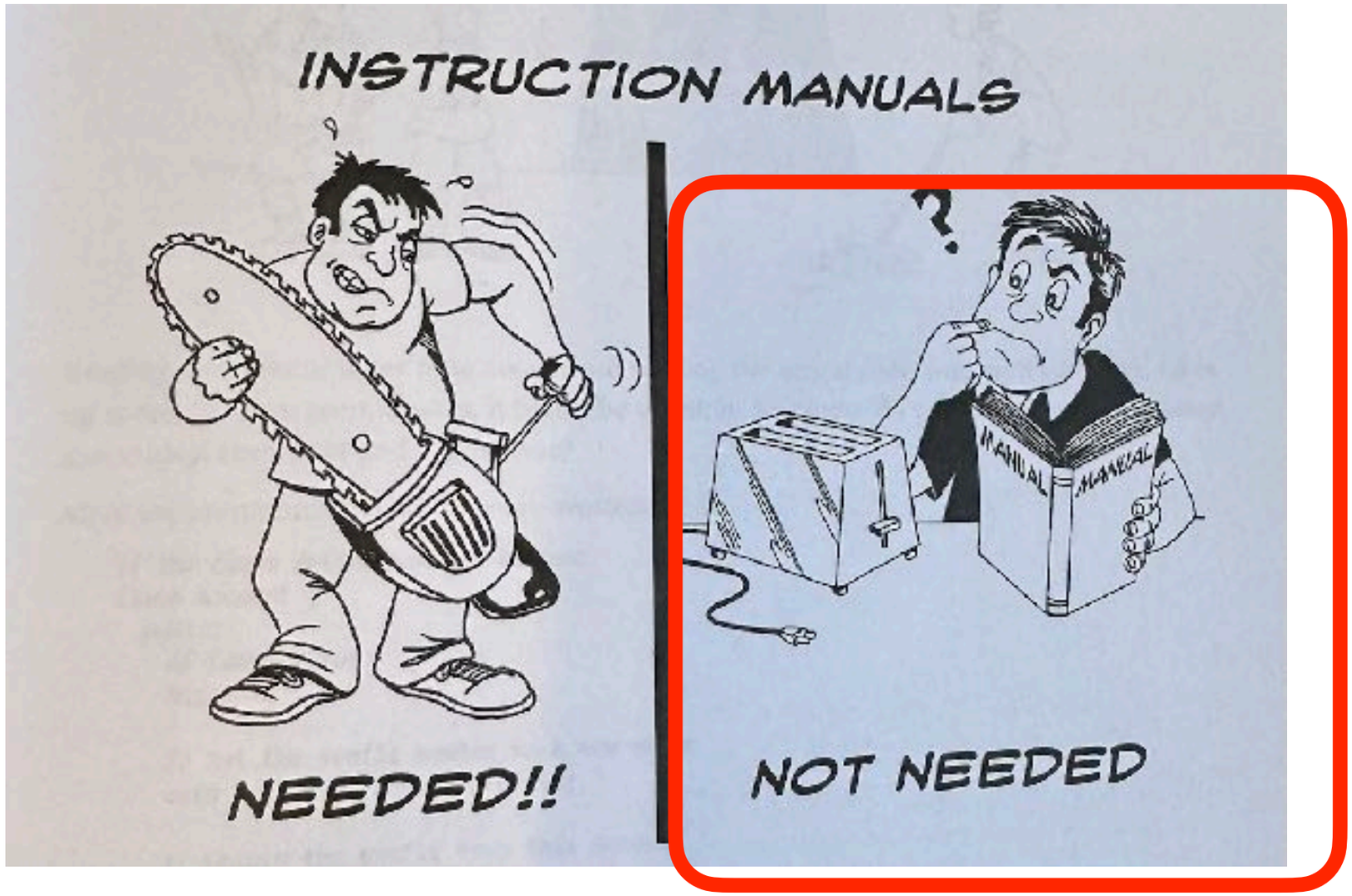
```
for (int i = 0; i < totalCreatures; i++) {
```

Use Camel Case

thisIsCamelCase
useItWhenWritingJava

this_is_snake_case
use_it_when_writing_python

To Comment or Not To Comment?



Reference: The Art of Readable Code by Boswell and Foucher

To Comment or Not To Comment?

```
int ar = rollDice(); // Adventurer's roll
int cr = rollDice(); // Creature's roll

// other lines of code


// if (ar > cr) {
// …
```

```
int adventurersRoll = rollDice();
int creaturesRoll = rollDice();
```

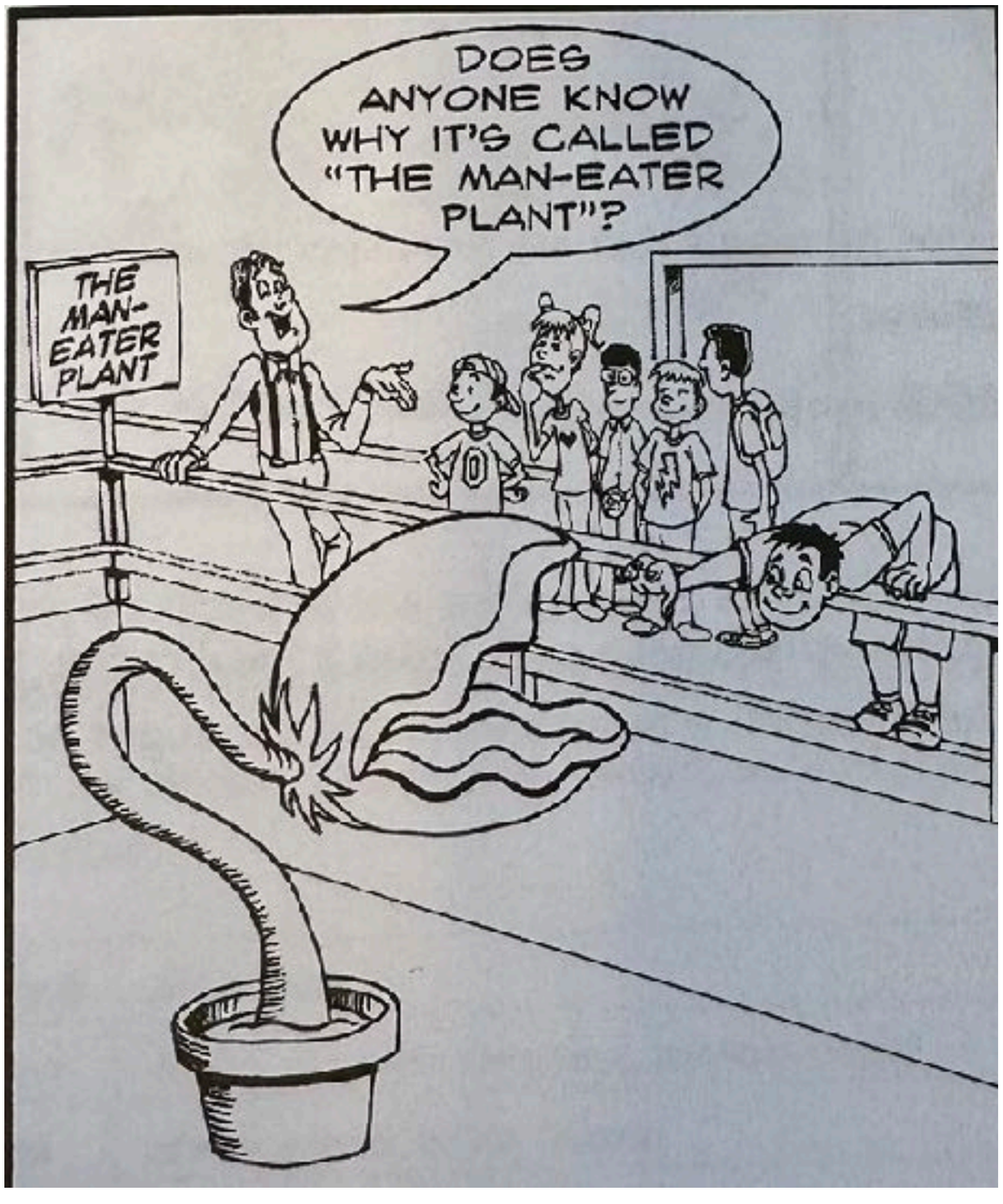
To Comment or Not To Comment?

```
if (currentCharacter.getHealth() > 0) {
    // Do stuff
```

```
// check if the character is still alive
if (currentCharacter.getHealth() > 0) {
    // Do stuff
```

```
if (currentCharacter.isAlive()) {
    // Do stuff
```

Packing Information Into Names



“The 3 Laws of Writing Readable Code”

https://www.youtube.com/watch?v=-AzSRHiV9Cc

- Reducing nesting in code — reducing cognitive load
  - Extracting code into helper methods
- DRY
- Naming!

```go
type P struct {
    N string
    P float64
}

func main() {
    ps := []P{
        {"Apple", 0.50},
        {"Banana", 0.25},
        {"Orange", 0.75},
        {"Pear", 0.30},
    }

    t := 0.08
    var tc float64 = 0

    for _, p := range ps {
        tc += p.P + (p.P * t)
    }

    ac := tc / float64(len(ps))
```

Grading Policy On Names

- 1% off for **each** bad name
- Maximum of 10% off
- Who decides what's a bad name?
- 1% off for **each** magic number
- Or magic string