

**2nd hardest thing in
computer science**

@pawel_lewtak

Definition?

"There are only two hard things in Computer Science: cache invalidation and naming things."

Phil Karlton

"There are 2 hard problems in computer science: cache invalidation, naming things, and off-by-1 errors"

Leon Bambrick

#2 Naming things*

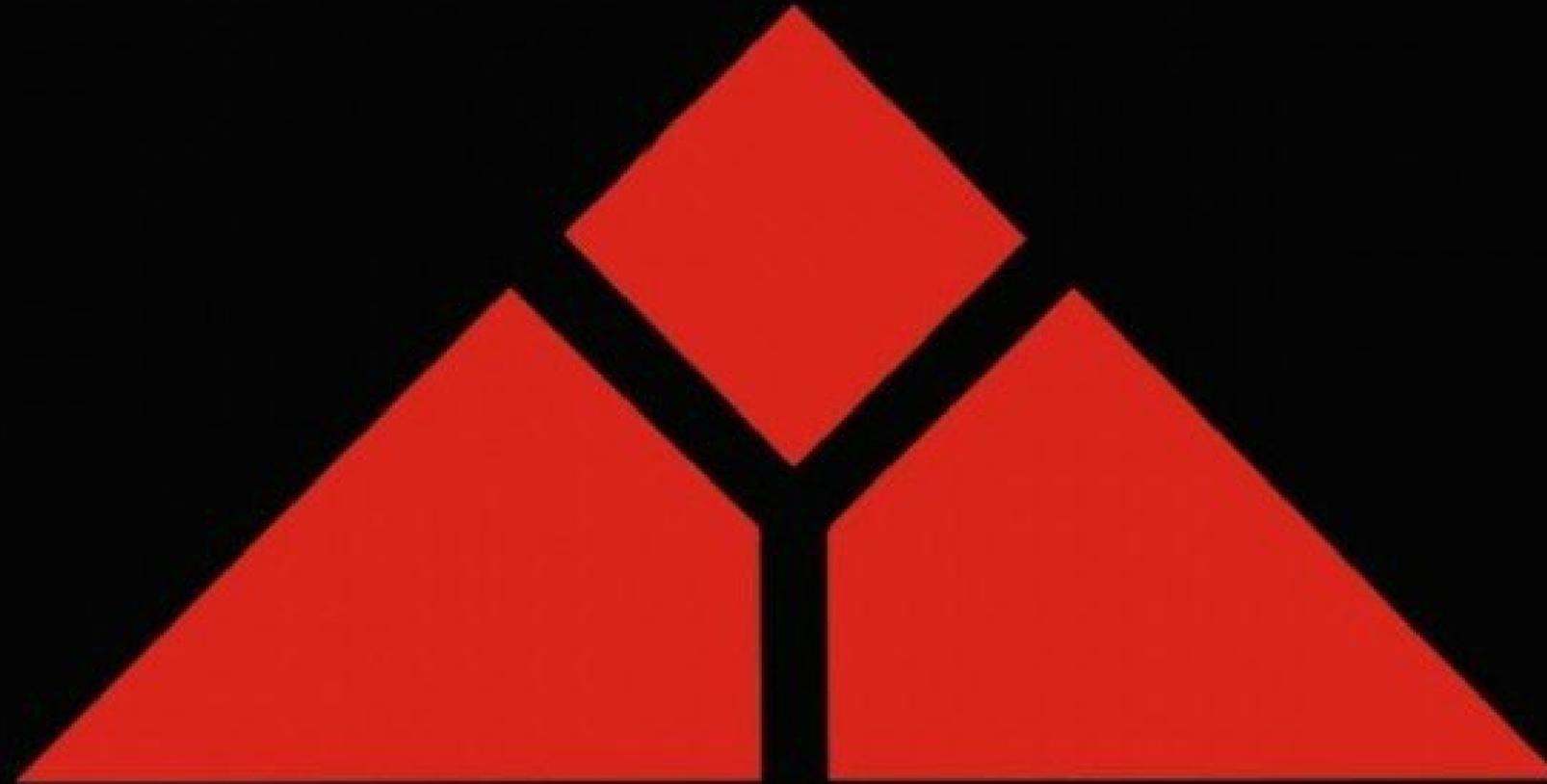
*things

- variables
- methods
- classes
- modules
- comments
- inline docs
- commit messages

**You don't code for
CPU**

**You don't code for
interpreter**

**You don't code for
compiler**



SKYNET

NEURAL NET-BASED ARTIFICIAL INTELLIGENCE

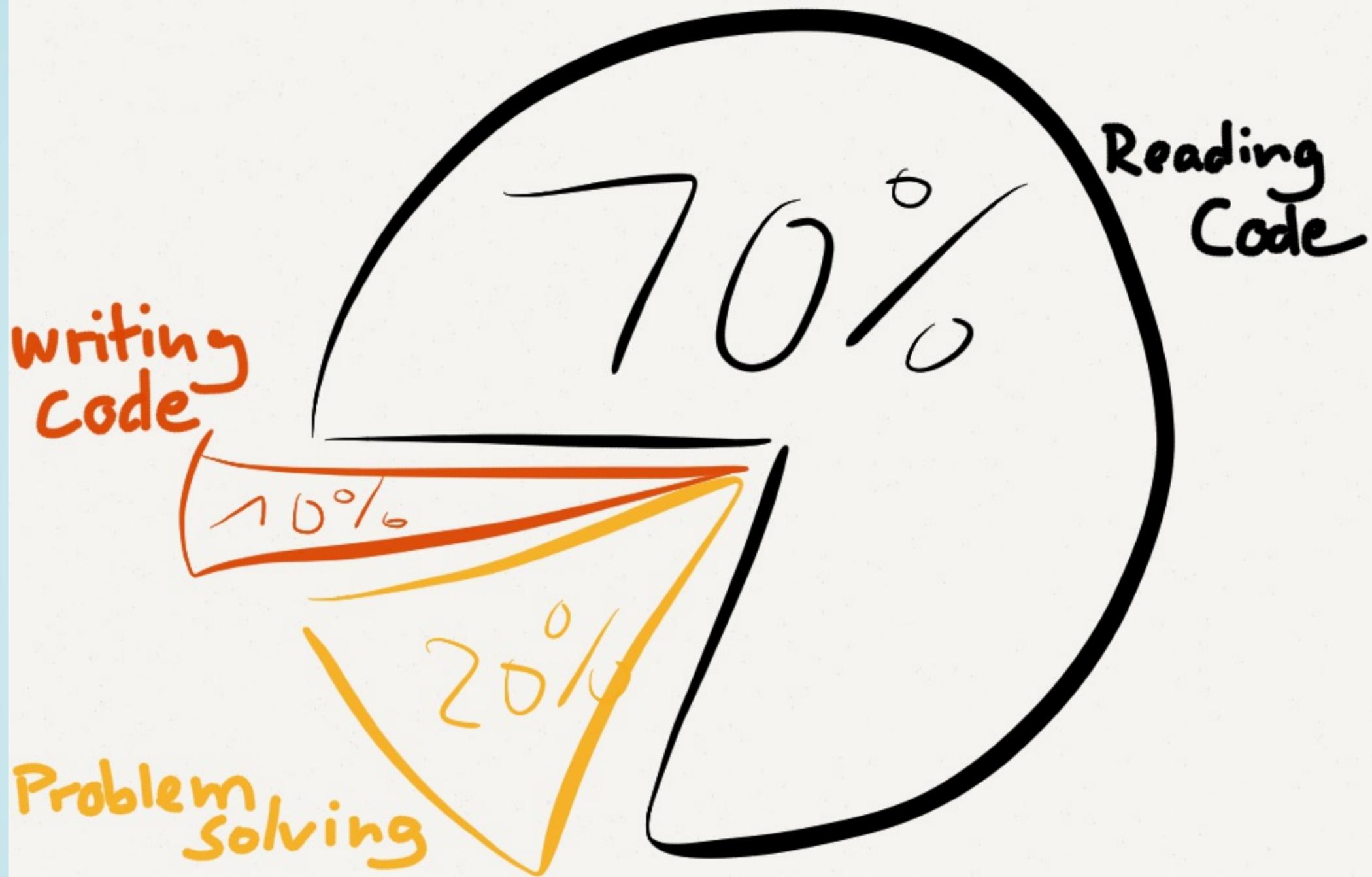
CYBERYNE SYSTEMS CORPORATION

You code for people

**You code for other
developers**

**You code for your
future self**

**Don't code,
wrote prose**



"Writing software as if we are the only person that ever has to comprehend it is one of the biggest mistakes and false assumptions that can be made."

Karolina Szczur

"Instead of imagining that our main task is to instruct a computer what to do, let us concentrate rather on explaining to human beings what we want a computer to do."

Donald E. Knuth

Comprehension

~70%

```
def a(b):  
    c = sorted(b)  
    d = len(b)  
    if d % 2 == 1:  
        return c[(d - 1) / 2]  
    else:  
        return (c[d/2 - 1] + c[d/2]) / 2
```

```
def median(pool):  
    copy = sorted(pool)  
    size = len(copy)  
    if size % 2 == 1:  
        return copy[(size - 1) / 2]  
    else:  
        return (copy[size/2 - 1] + copy[size/2]) / 2
```

Self-documenting code

**Code written by
somebody else**

Programming is mapping

- from problem domain
- via intermediate domain
- into programming domain

DDD FTW

Worst variable name

data

**Thank You,
Captain
Obvious!**



Second worst name?

data2

```
total = price * qty
total2 = total - discount
total2 += total * taxrate
```

```
total3 = purchase_order_value + available_credit
if total2 < total3:
    print ("You can't afford this order.")
```

```
order_total = price * qty
payable_total = order_total - discount
payable_total += payable_total * taxrate
```

```
available_funds = purchase_order_value + available_credit
if payable_total < available_funds:
    print ("You can't afford this order.")
```

"No-one sets out to write legacy code"

Rachel Willmer

Broken window theory

Code will decay

Design patterns

*Misapplied Java design patterns
are the root of all
AbstractWordFactoryFactory("evil")*

HN comment

Naming conventions

TL;DR

- CamelCaseClass
- methodName
- someVariable
- CAPITAL_CONSTANT

syntax* < *semantics

Common issues

Pseudo getter

get_data()

with extra operations inside

get_create_object()

- fetch
- find
- lookup
- create
- calculate

Not really a boolean

is_active()

```
def is_active():  
    if cond:  
        return 'false'  
    return 'true'
```

is_valid()

```
def is_valid():  
    if input_is_valid:  
        return True
```

**Plural / singular
names**

```
def get_person():  
    return ['John Doe', 'Jane Doe']
```

```
def get_employers():  
    return 'John Doe'
```

Misleading docs

```
def get_lowest_price(user):  
    pass
```

```
def get_lowest_price(user):  
    """Actually it returns the highest price."""  
    pass
```

**More than one
responsibility**

Abbreviations

pos
mod
abs
auth

Synonyms

<ThatThing>Manager

- UserManager
- StringManager
- ProductManager
- etc.

Alternatives

- Builder
- Writer
- Adapter
- Factory
- Handler
- Provider
- Converter

Magic numbers

```
import requests

response = requests.get('https://www.google.com/')
if response.status_code == 200:
    print ("It works!")
elif response.status_code == 418:
    print ("Unexpected teapot!")
```

```
import requests

response = requests.get('https://pl.pycon.org/')
if response.status_code == requests.codes.ok:
    print ("It works!")
elif response.status_code == requests.codes.teapot:
    print ("Unexpected teapot!")
```

Useless comments

```
def get_data():  
    """ Returns the data. """  
    pass  
  
def get_max_id_from_db():  
    """ Return maximum ID value from the database. """  
    pass
```

**Explain why,
not what or how**

"Code should have comments, but if your file is more than 25% comments, that's a red flag: you may be explaining bad code"

Adam Culp

Commit messages

-  Deploy fixes
-  trigger commit
-  fix
-  fix
-  compose fiz
-  Sql fix
-  remove sql
-  config fix
-  Docker compose splited
-  Build fix
-  typo
-  env
-  test fix
-  fix
-  trigger
-  last try
-  Easier tests
-  clean up
-  More clean ups
-  bring dredd back
-  fix

Bad name:

- Does more than what it says
- Says more than what it does
- Does the opposite
- Contains more than what it says
- Says more than what it contains
- Contains the opposite

Good practices

Specific names
No generics

Short names

Do not use negation

is_not_enabled()

is_disabled()

Consistent names

Code & docs

Single responsibility

Domain terms

Think about it

ASCII only

~~Hungarian notation~~

```
hostList, hostSet => hosts, validHosts  
valueString => firstName, lowercasedSKU  
intNumber => accountNumber
```

Tests!

Commit message

Good commit message

- Speeds up review process
- Helps write release notes
- Helps future maintainers

Short (50 chars or less) summary of changes

More detailed explanatory text, if necessary. Wrap it to about 72 characters or so. In some contexts, the first line is treated as the subject of an email and the rest of the text as the body. The blank line separating the summary from the body is critical (unless you omit the body entirely); tools like rebase can get confused if you run the two together.

Further paragraphs come after blank lines.

- Bullet points are okay, too
- Typically a hyphen or asterisk is used for the bullet, preceded by a single space, with blank lines in between, but conventions vary here

How?

Agree on *standards*

Boy Scout Rule

Practice

Improve vocabulary

Refactor

Code reviews

Short, bite size, single logical change

Code ownership

Commit messages

Research papers

- <https://www.cqse.eu/publications/2005-concise-and-consistent-naming.pdf>
- <http://www.cs.loyola.edu/~lawrie/papers/lawriejese07.pdf>
- https://www.researchgate.net/publication/224079441_Relating_Identifier_Naming_Flaws_and_Code_Quality_An_Empirical_Study
- <http://www.veneraarnaudova.com/wp-content/uploads/2014/10/2014-EMSE-Arnaodova-et-al-Perception-LAs.pdf>

Thank you!

@pawel_lewtak

Questions?

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