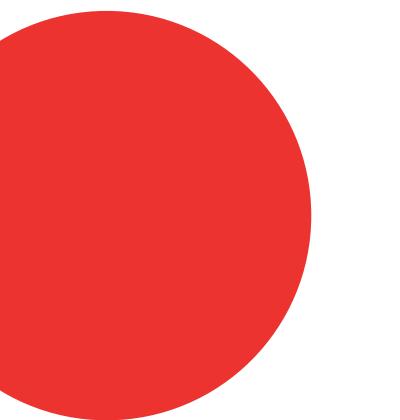
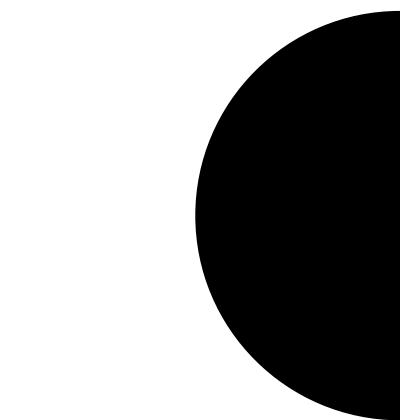




# Readable Code

Laura Savino

@#%&



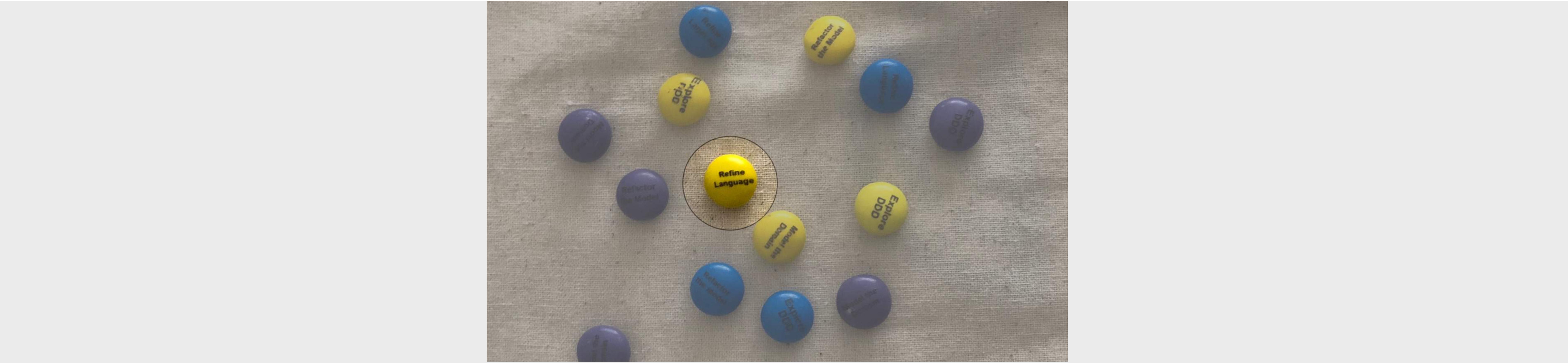


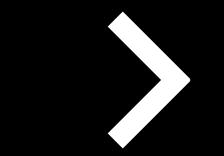
# Readable Code

---

Laura Savino

# REFINING LANGUAGE





# CONTENTS



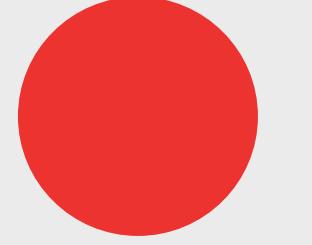
- 01** LANGUAGE & CODE
- 02** WHAT IS READING?
- 03** WHY TO WRITE READABLY

- 04** HOW TO WRITE READABLY
- 05** WHEN TO WRITE READABLY



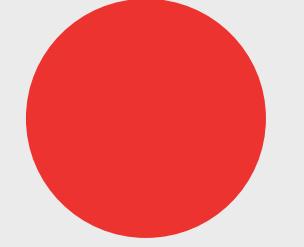
# 01 LANGUAGE & CODE

# LANGUAGE & CODE



**"Hello, world!"**

# LANGUAGE & CODE

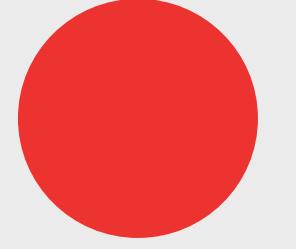


**“Hello, world!”**



**“How have you been?”**

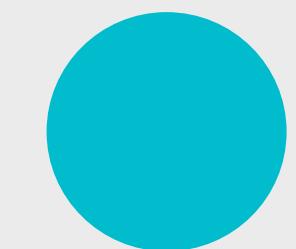
# LANGUAGE && CODE



**“Hello, world!”**



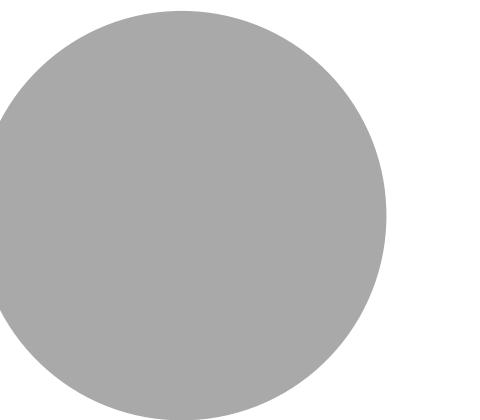
**“How have you been?”**



**“Let’s talk values...”**

**LANGUAGE && CODE**

**Nuance, subtlety, & stereotypes**

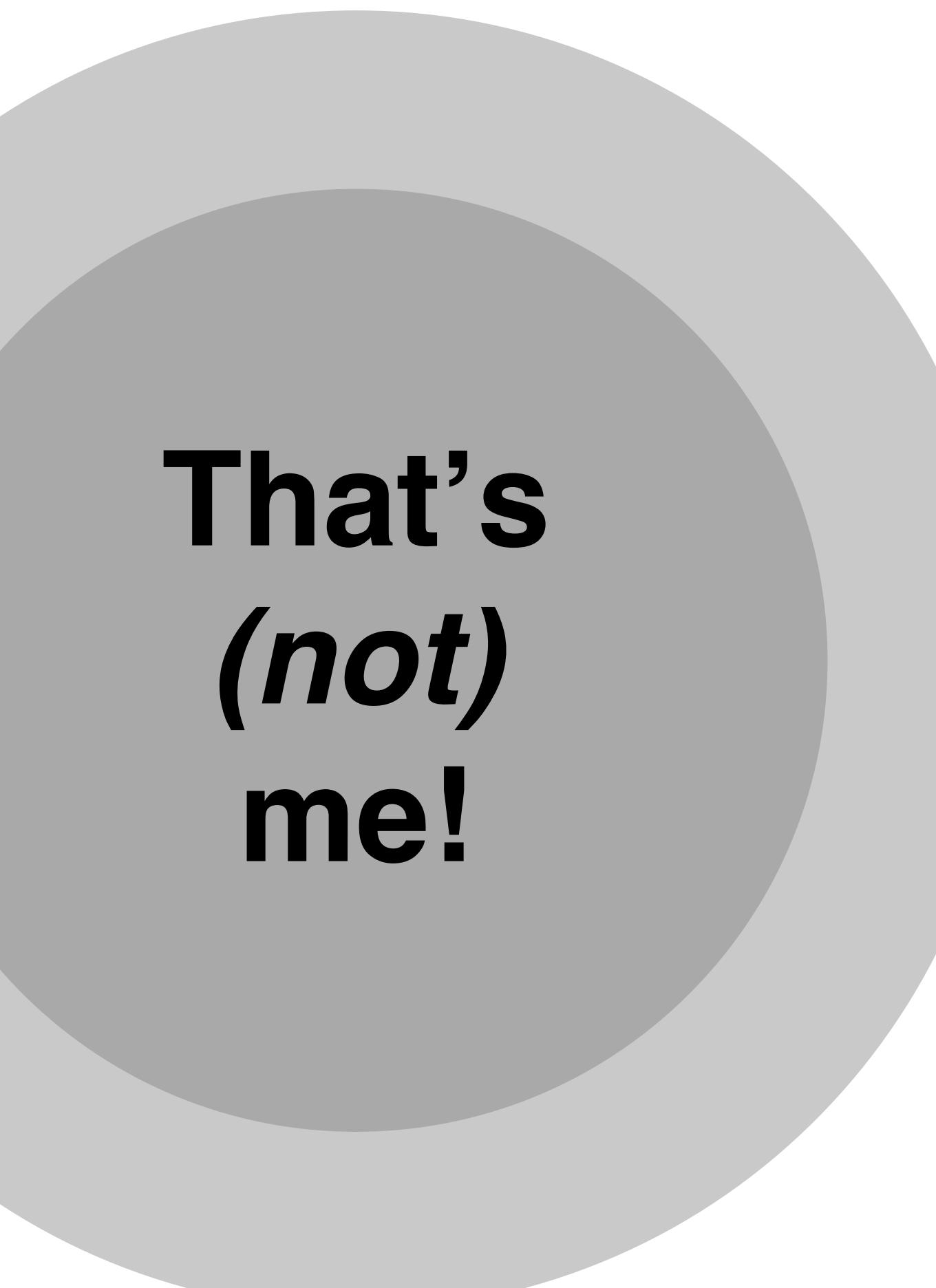


# LANGUAGE && CODE



hi, y'all!

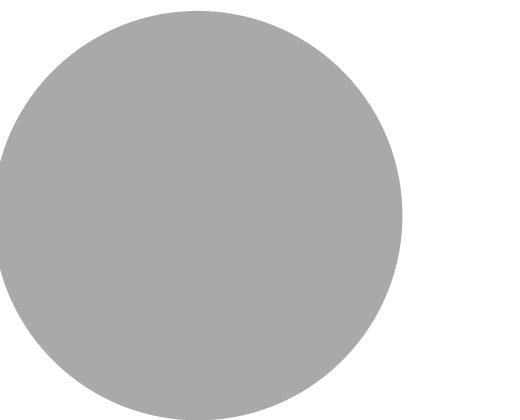
# LANGUAGE && CODE



That's  
*(not)*  
me!

**LANGUAGE && CODE**

**Breaking expectations**



# **LANGUAGE && CODE**



**thank you**

# LANGUAGE && CODE

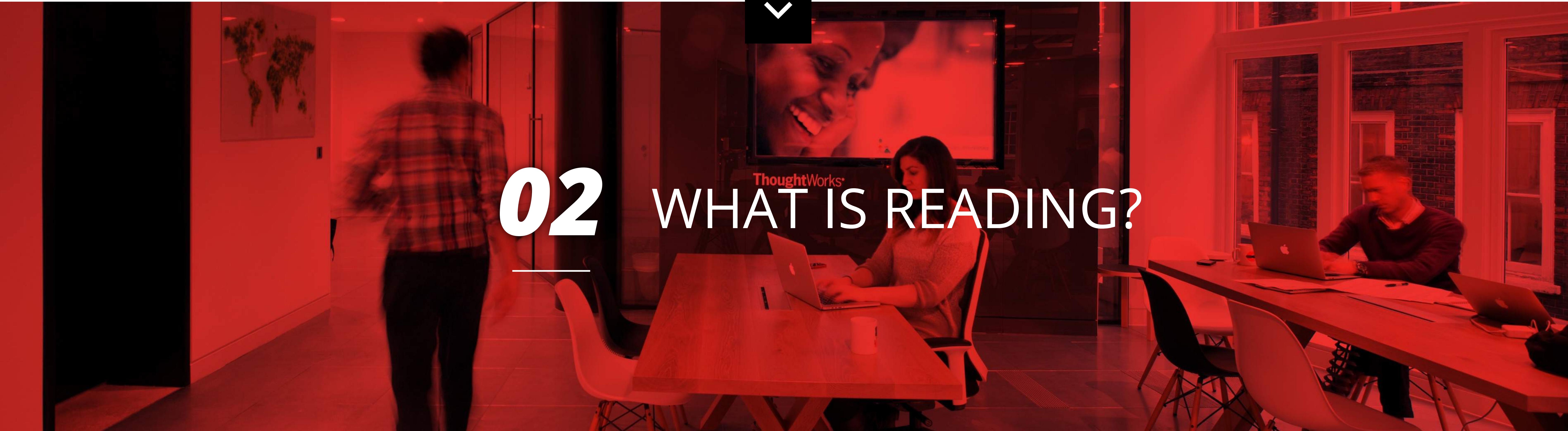
```
let baseCosts: [Double] = ...  
var totalCosts = [Double]()  
for cost in baseCosts {  
    totalCosts.append(cost * 1.15)  
}
```

# LANGUAGE && CODE

```
let baseCosts: [Double] = ...  
let totalCosts = baseCosts.map() {  
    $0 * 1.15  
}
```

02

## WHAT IS READING?



# WHAT IS READING?



“I'm having trouble understanding this code.”

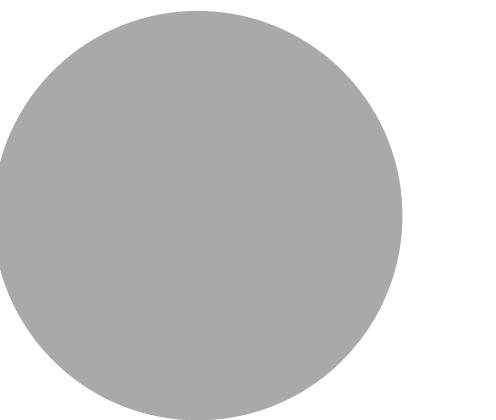


“But it's more readable this way!”

“**Readable**”

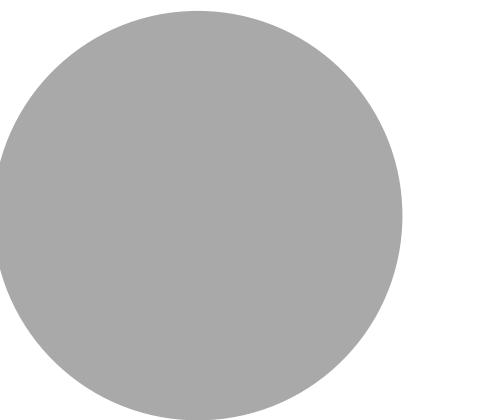
# WHAT IS READING?

Readability needs a reader.



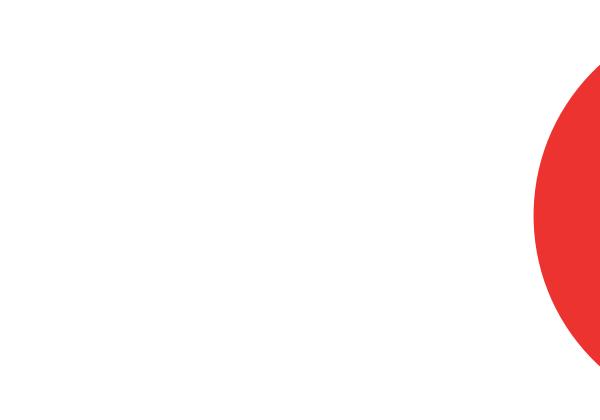
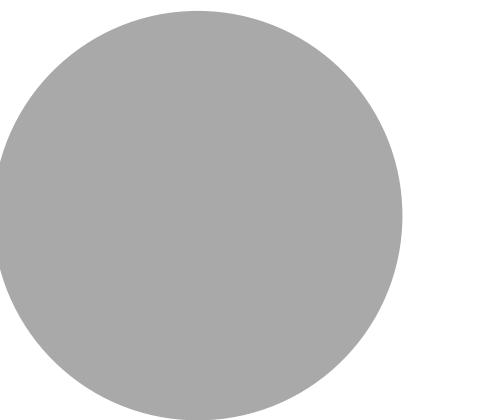
# WHAT IS READING?

Fluency uses experience.



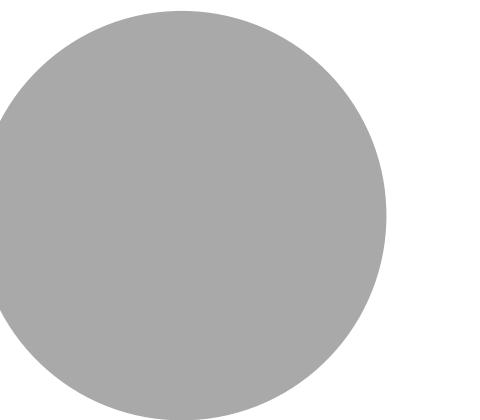
# WHAT IS READING?

two very different readers...



# WHAT IS READING?

What about  
comments?



# USE PATTERN MATCHING



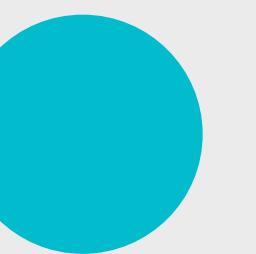
This makes some  
sense

```
// NEVER CHANGE VARIABLES X AND Y  
perimeter = x * 2 + y * 2
```



Starting to diverge:

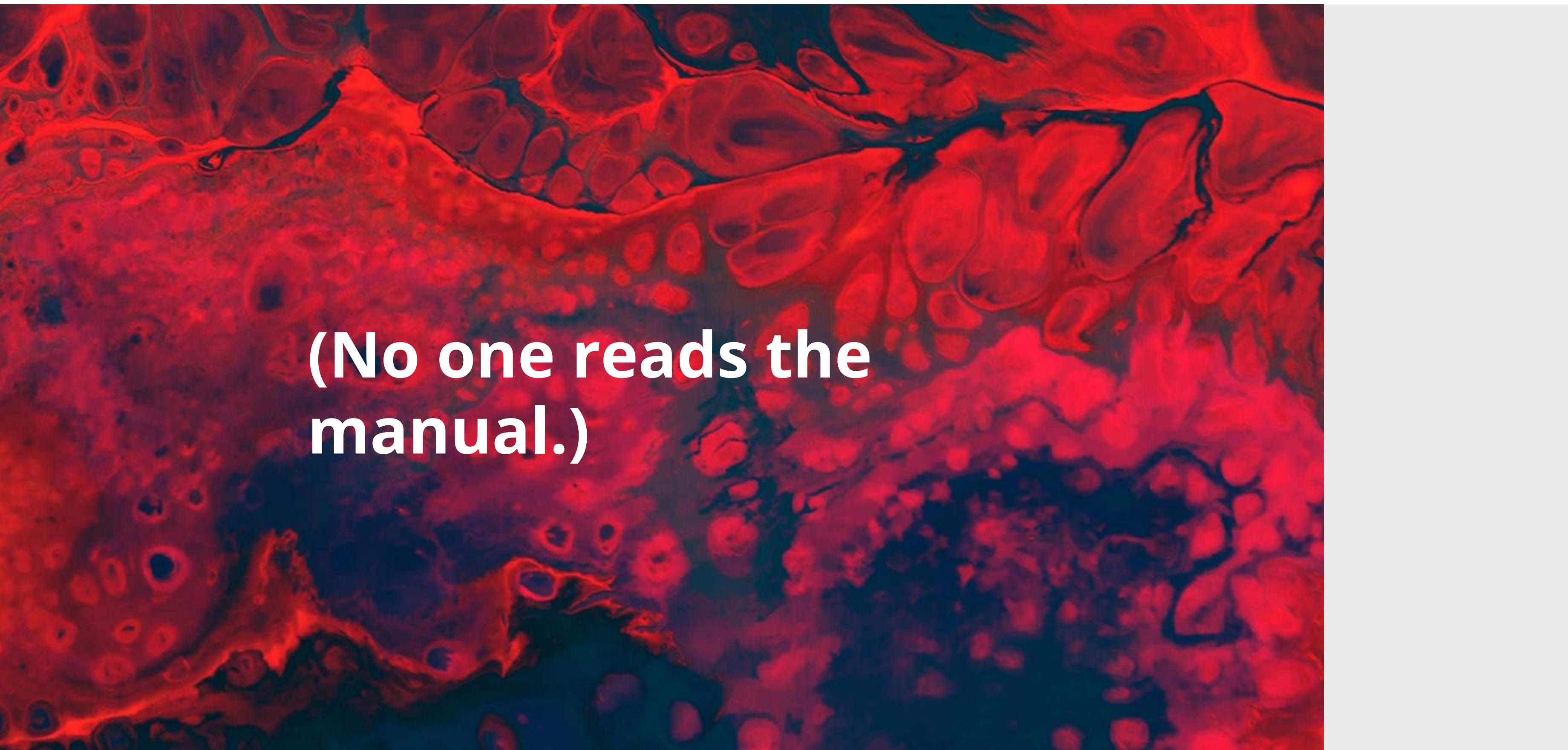
```
// NEVER CHANGE VARIABLES X AND Y  
perimeter = width * 2 + height * 2
```



Oh, dear.

```
// NEVER CHANGE VARIABLES X AND Y  
perimeter = radius * radius * pi
```

# What about comments?



**(No one reads the manual.)**

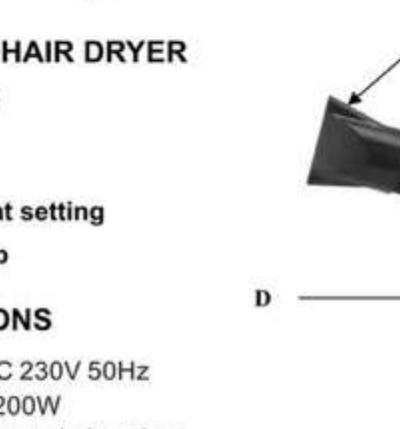
## INTRODUCTION

Thank you for purchasing our "Essentials" Hair dryer. Each unit has been manufactured to ensure safety, reliability, and ease of use. Before use, please read these instructions carefully and keep them for future reference.

## IMPORTANT SAFEGUARDS

When using any electrical appliance, basic safety precautions should always be followed, including:

- The use of accessory attachments that are not recommended or supplied by the manufacturer may result in injuries, fire or electric shock.
- Do not let the cord hang over the edge of a table or counter. Ensure that the cord is not in a position where it can be pulled on inadvertently.
- Do not allow the cord to touch hot surfaces and do not place on or near a hot gas or electric burner or in a heated oven.
- Use of an extension cord with this appliance is not recommended. However, if it is necessary to use an extension lead, ensure that the lead is suited to the power consumption of the appliance to avoid overheating of the extension cord, appliance or plug point. Do not place the extension cord in a position where it can be pulled on by children or animals or tripped over.
- Children should be supervised to ensure that they do not play with the appliance.
- Always ensure that the voltage on the rating label corresponds to the voltage in your home.
- Check the power cord and plug regularly for any damage. If the cord or the plug is damaged, it must be replaced by the manufacturer or a qualified person in order to avoid an electrical hazard.
- This appliance is intended for household use only. Industrial or commercial use will void the warranty, and the supplier can not be held responsible for injury or damage caused when using the appliance for any other purpose than that intended.
- Incorrect operation and improper use can damage the appliance and cause injury to the user.
- Do not use the appliance if it has been dropped or damaged in any way. In case of damage, take the unit in for examination and/or repair by an authorized service agent.
- To reduce the risk of electric shock, do not immerse or expose the motor assembly, plug or the power cord to water or any other liquid.
- Never immerse the unit in water or any other liquid for cleaning purposes.
- Remove the plug from the socket by gripping the plug. Do not pull on the cord to disconnect the appliance. Always unplug the unit when not in use, before cleaning or when adding or removing parts.



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## SPECIFICATIONS

Voltage : AC 230V 50Hz

Wattage : 1200W

Cord : 2 round pins plug.

## USING YOUR HAIR DRYER

### READ ALL INSTRUCTIONS CAREFULLY BEFORE USING THIS APPLIANCE

### WARNING-To reduce the risk of burns, electrocution, fire or injury to persons:

1. An appliance should never be left unattended when plugged in.
2. Close supervision is necessary when this appliance is used by, on, or near children or invalids.
3. Use this appliance only for its intended household use as described in this manual. Do not use attachments which are not recommended by the manufacturer.
4. Never operate this appliance if it has a damaged cord or plug, if it is not working properly, if it has been dropped or damaged or dropped into water. Return the appliance to a Service Center for examination and repair.

2

3

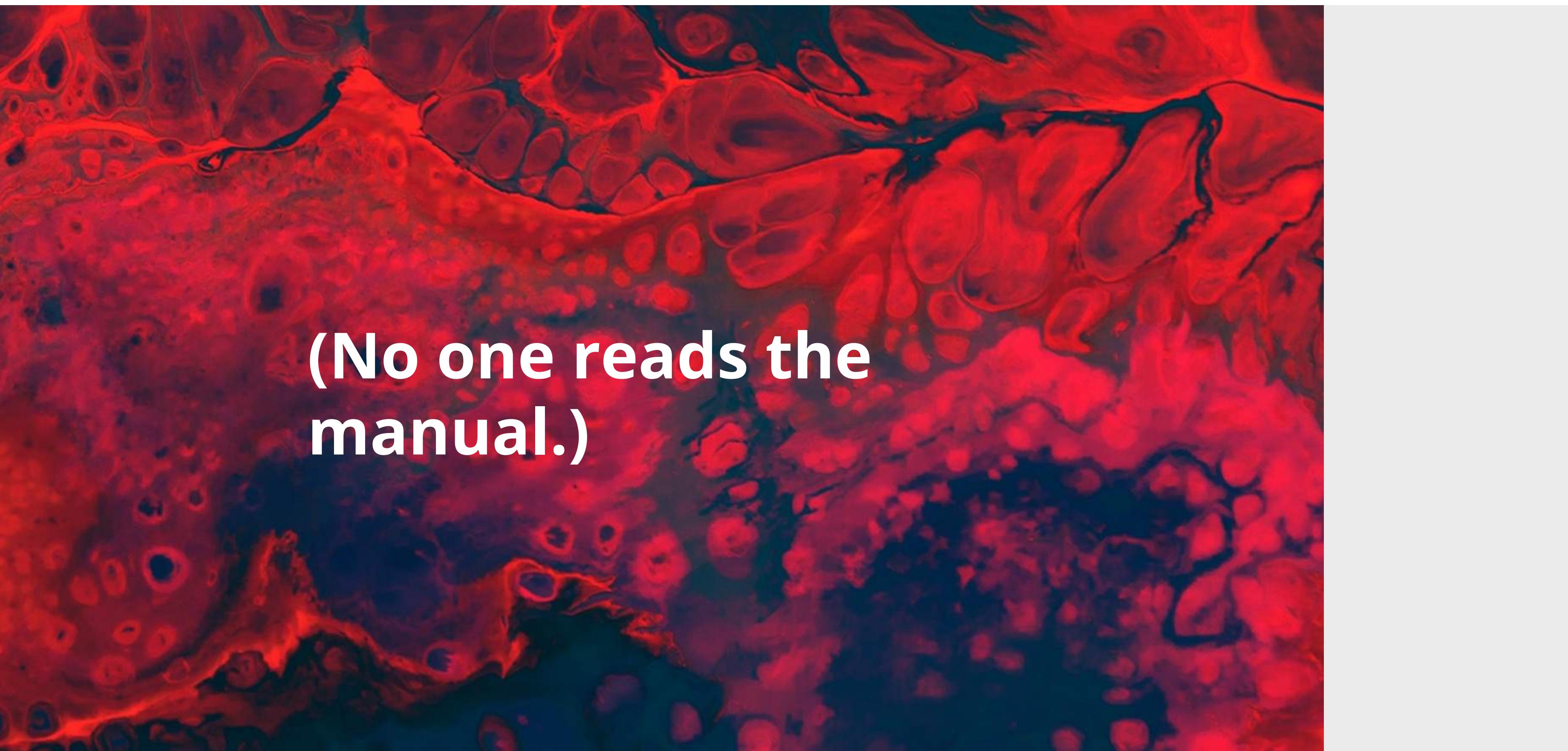
4

## CARE AND CLEANING

- **IMPORTANT:** Always ensure that hair dryer is disconnected from the electric outlet before cleaning. Use a damp cloth for cleaning and then wipe it dry. This will help preserve the original finish of your hair dryer. Abrasive cleaners should not be used.
- **WARNING:** Never immerse the hair dryer in water and always ensure that the plug is kept dry. Frequently clean out any hair or fluff that becomes stuck in the air intake filter. To clean the filter, vacuum or dry brush clean, never immerse the filter in water. Failure to keep filter clean may result in overheating.

5

# What about comments?



## INTRODUCTION

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- Never immerse the unit in water or any other liquid for cleaning purposes.
- Remove the plug from the socket by gripping the plug. Do not pull on the cord to disconnect the appliance. Always unplug the unit when not in use, before cleaning or when adding or removing parts.

## KNOW YOUR HAIR DRYER

A: Concentrator

B: Main body

C: Rear cover

D: 2 Speed / Heat setting

E: Hanging Loop



## SPECIFICATIONS

Voltage : AC 230V 50Hz

Wattage : 1200W

Cord : 2 round pins plug.

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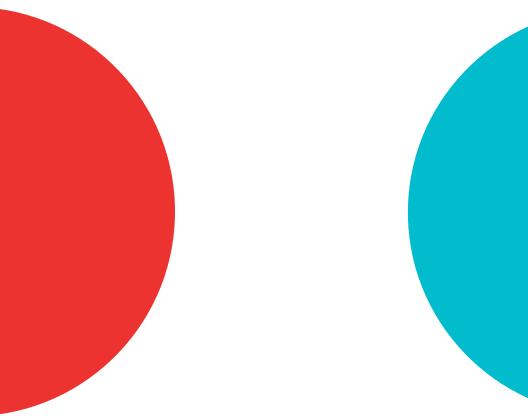
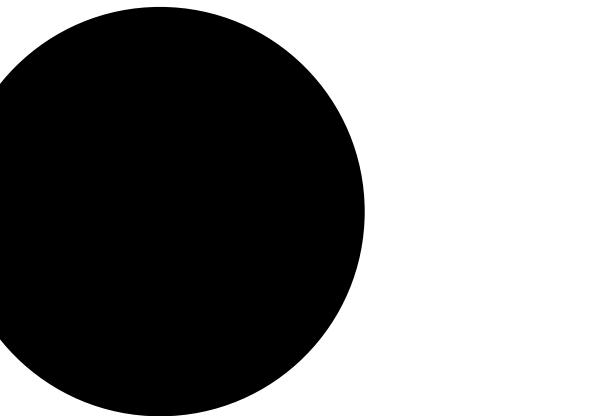
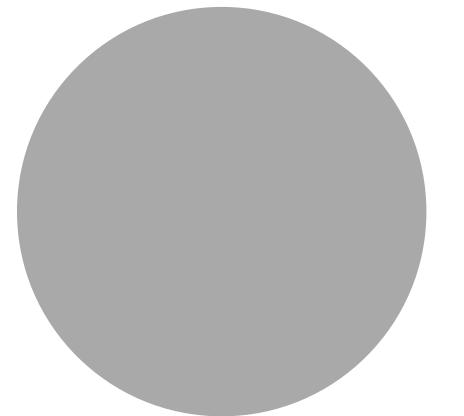
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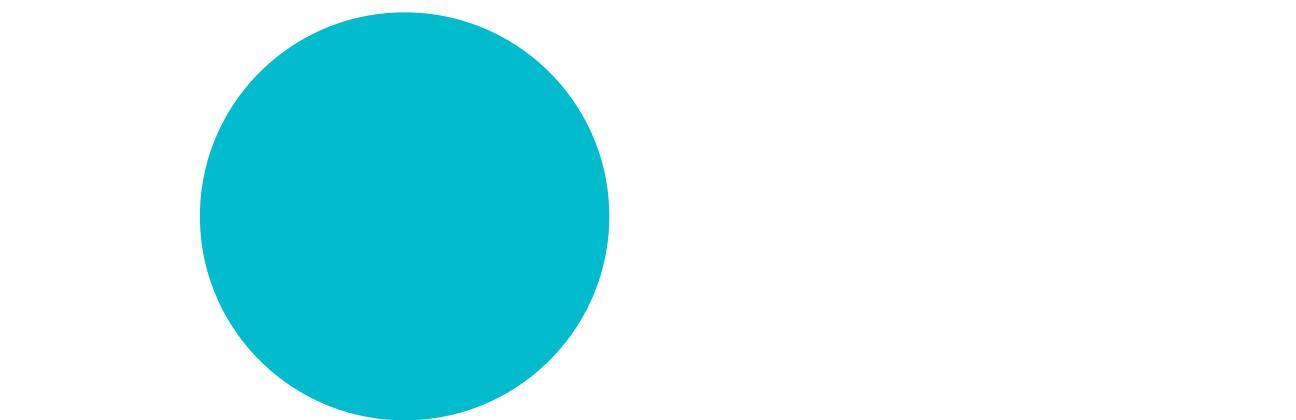
# WHAT IS READING?

Working memory



# WHAT IS READING?

# Working memory



supercalifragilisticexpialidocious

NSURLRedirectToNonExistentLocation

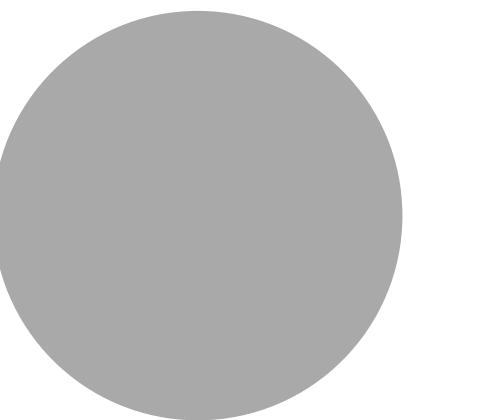
# WHAT IS READING?



Chunking

# WHAT IS READING?

A moment  
for poetry



# e. e. cummings

when serpents bargain for the right to squirm  
and the sun strikes to gain a living wage -  
when thorns regard their roses with alarm  
and rainbows are insured against old age

...

then we'll believe in that incredible  
unanimal mankind(and not until)

# e. e. cummings

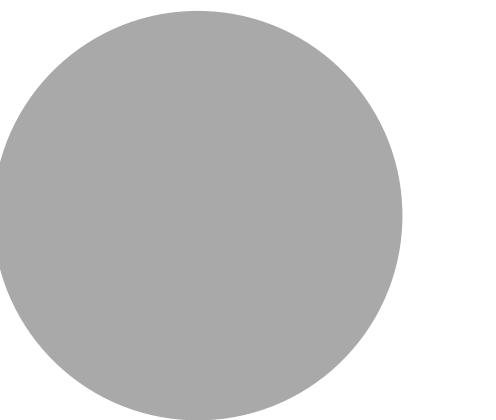
when serpents bargain for the right to squirm  
and the sun strikes to gain a living wage -  
when thorns regard their roses with alarm  
and rainbows are insured against old age

...

then we'll believe in that incredible  
unanimal mankind(and not until)

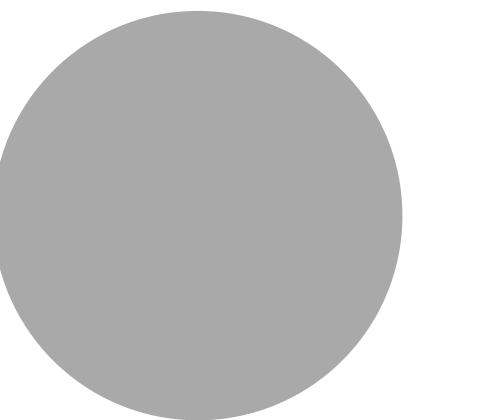
# WHAT IS READING?

You can decipher,  
with tools



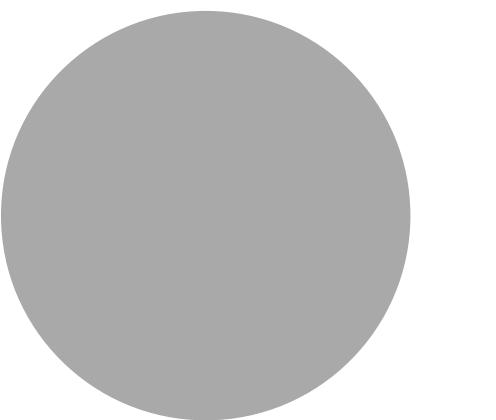
# WHAT IS READING?

Deciphering is not reading



## WHAT IS READING?

Cerebral poetry has no place  
in production software.



# WHAT IS READING?

blue

black

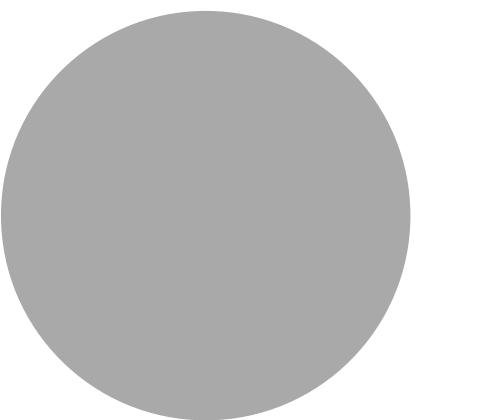
red



青  
黒  
赤

## WHAT IS READING?

Fluent reading is  
quick, correct understanding.

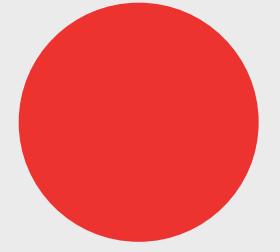




## 03 WHY TO WRITE READABLY



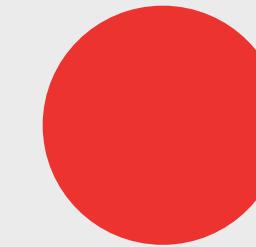
# OBJECTIONS TO READABILITY



**"You're a professional – figure it out!"**

Part of a programmer's job is to understand code written by their colleagues.

# OBJECTIONS TO READABILITY



**“You’re a professional – figure it out!”**

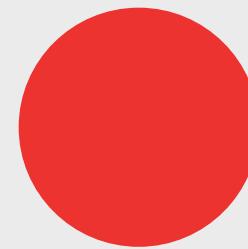
Part of a programmer’s job is to understand code written by their colleagues.



**“Fluent people write faster.”**

People who know a language well use it more quickly than beginners.

# OBJECTIONS TO READABILITY



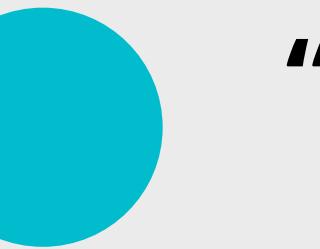
**"You're a professional – figure it out!"**

Part of a programmer's job is to understand code written by their colleagues.



**"Fluent people write faster."**

People who know a language well use it more quickly than beginners.



**"Our vocabulary keeps changing."**

Programmers constantly define new terms in a codebase – it's not possible to instantly learn every new symbol.

# OBJECTIONS TO READABILITY

**But.**

# WHY WRITE READABLE CODE?

**Willpower:**  
**You vs. Radishes**

# WHY WRITE READABLE CODE?

Fluency & focus



# WILLPOWER

Save your teammates' energy.

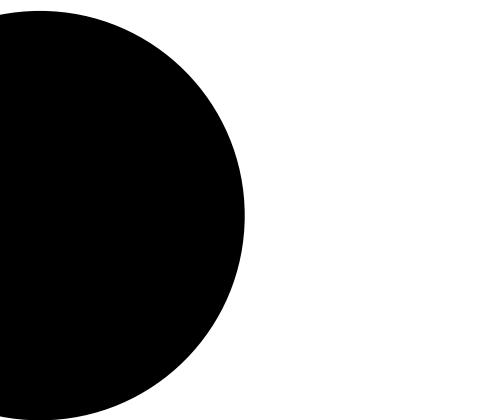
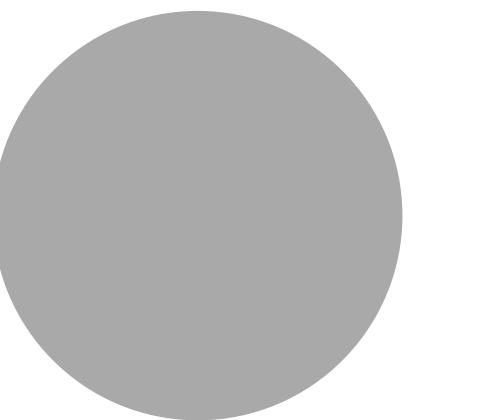
THE  
ART  
OF  
WRITING



## 04 HOW TO WRITE READABLY

# HOW TO WRITE READABLY

Make allowances  
for non-fluent speakers



# AVOID SLANG

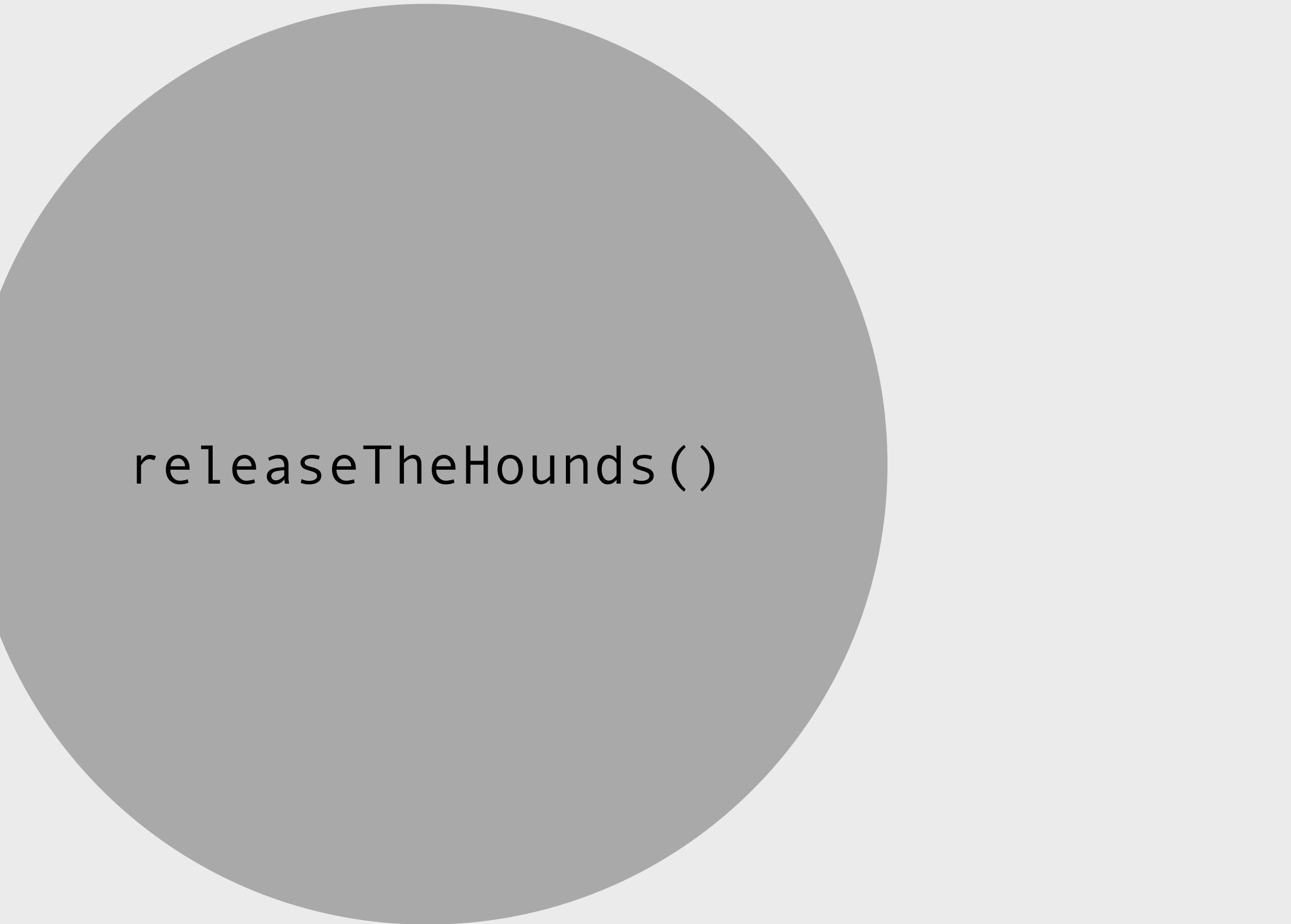
A large gray circle is positioned on the left side of the slide. Inside the circle, the text "You rock my socks." is written in a black, sans-serif font.

"You rock my  
socks."

A large red circle is positioned on the right side of the slide. Inside the circle, the text "You are really great." is written in a black, sans-serif font.

"You are really great."

# AVOID SLANG



releaseTheHounds()



beginAppSetupNetworkRequests()

# ENUNCIATE CLEARLY



"Jeetcheet?"



"Did you eat yet?"

# ENUNCIATE CLEARLY

```
a = ks.filter{...}.map{...}
```

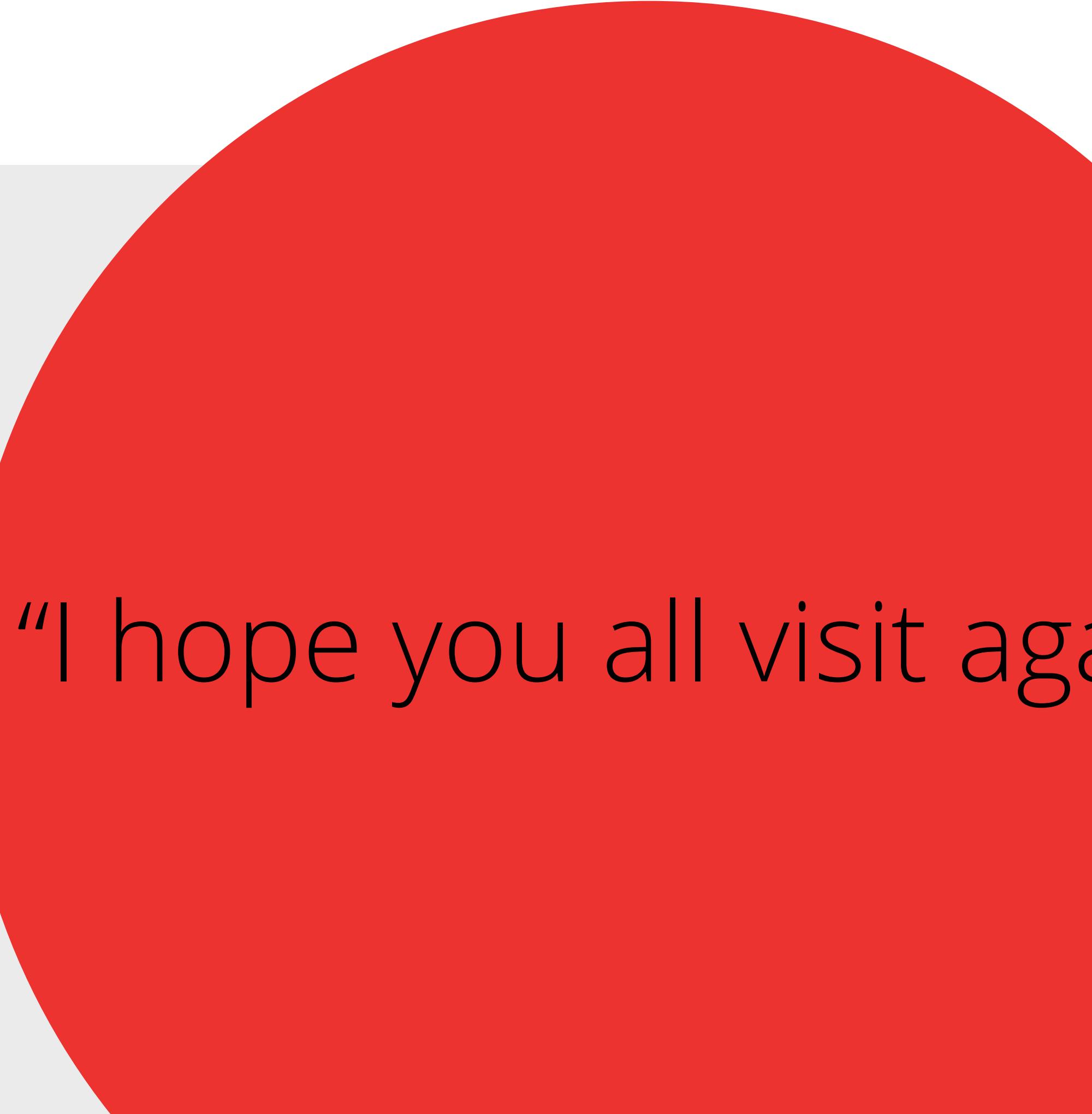
```
newOrders = items.filter{...})
```

```
newAddresses = newOrders.map({...})
```

# INTRODUCE REGIONALISMS SLOWLY

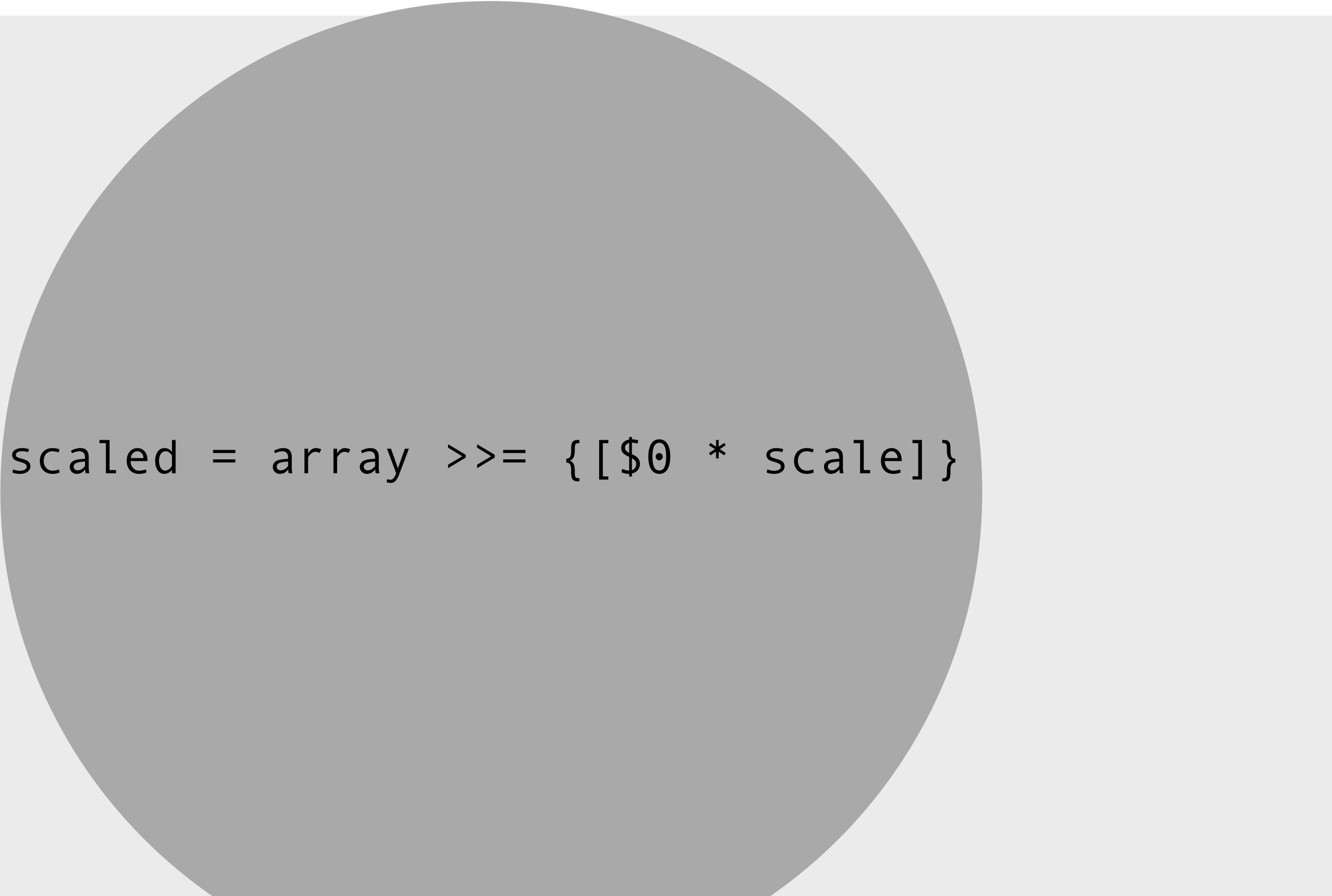


“Y'all come  
back now!”

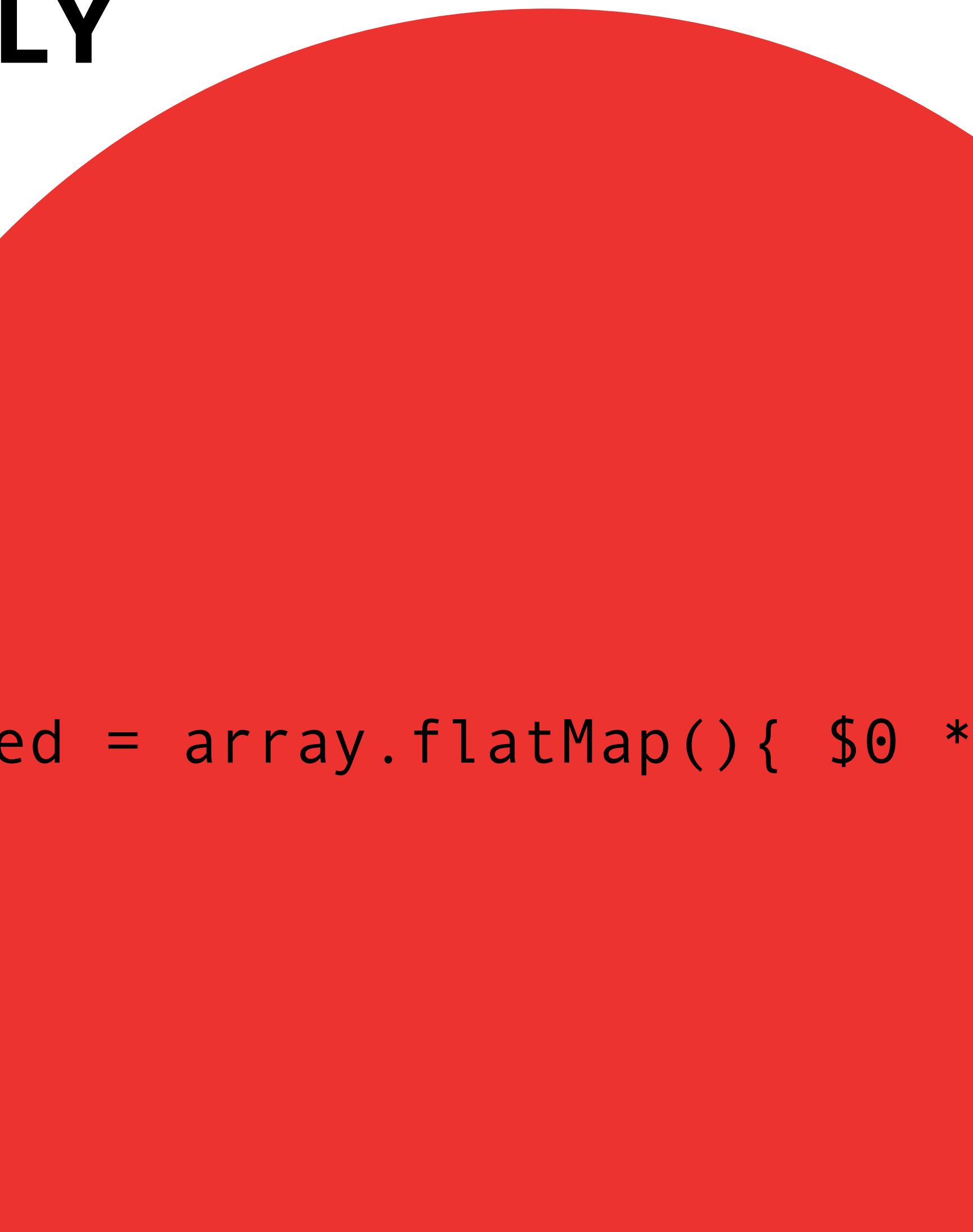


“I hope you all visit again!”

# INTRODUCE REGIONALISMS SLOWLY



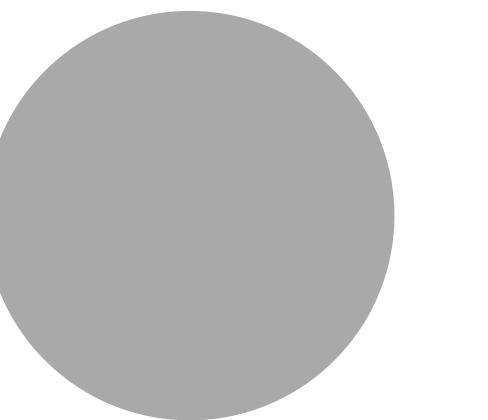
```
scaled = array >>= {[$0 * scale]}
```



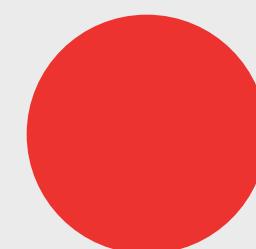
```
scaled = array.flatMap({ $0 * scale })
```

# HOW TO WRITE READABLY

Use pattern matching



# USE PATTERN MATCHING



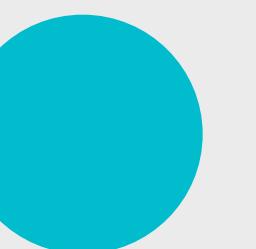
**Are these related?**

```
goodIdeaText = "An ideal choice"  
detailsOfBadIdea = "Oh no."
```



**Ah yes, here's a group:**

```
ideaTextGood = "An ideal choice"  
ideaTextAwful = "Oh no."  
ideaTextImpish = "Fun!"  
ideaTextDull = "Pedestrian."
```

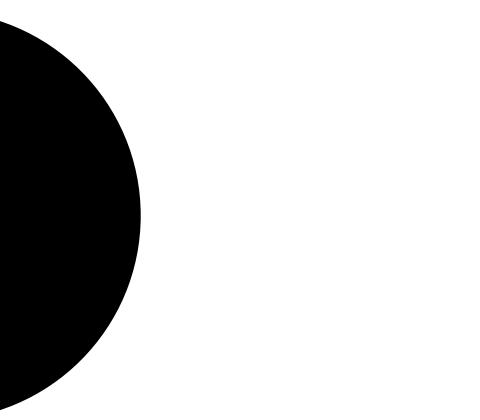
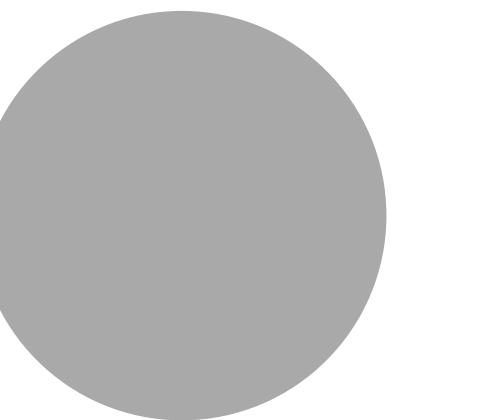


**This is scannable!**

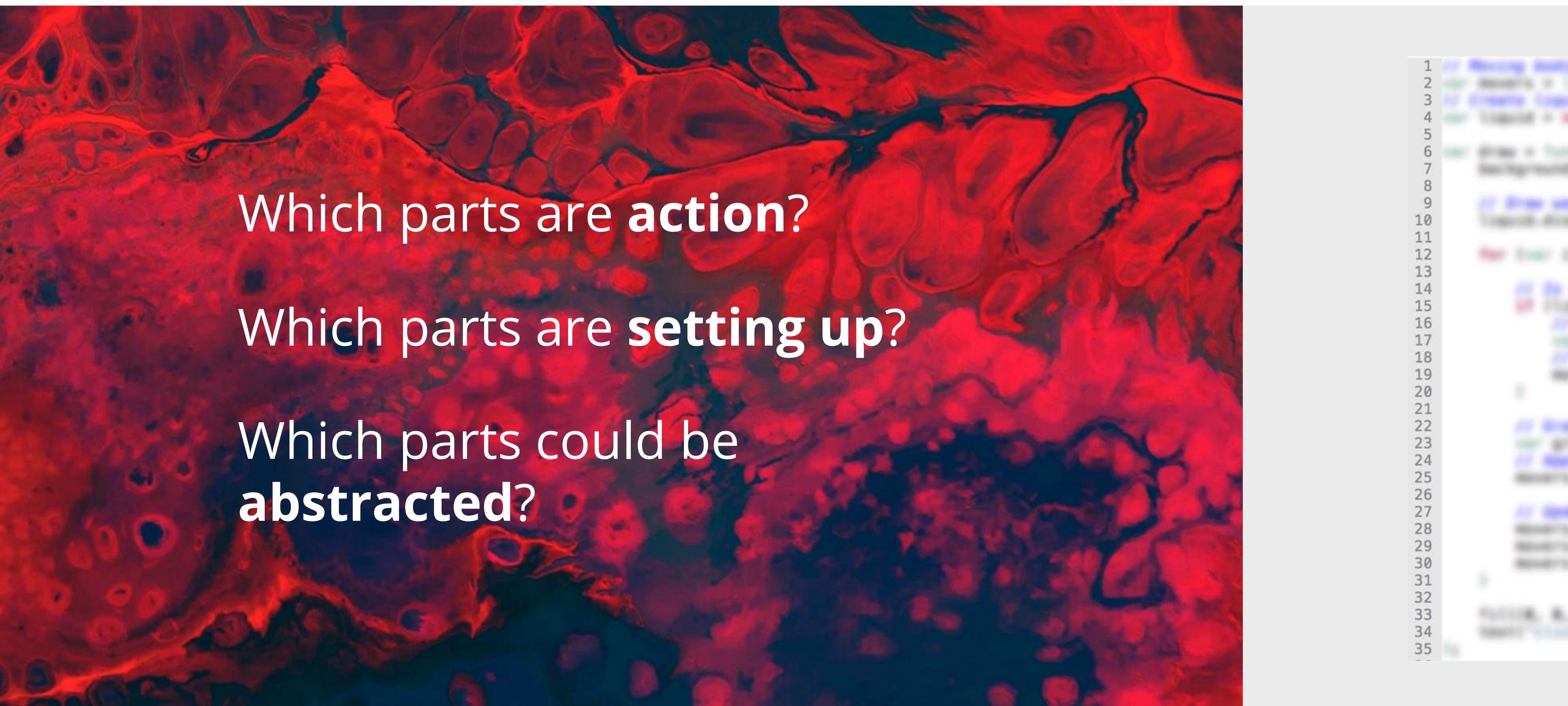
```
ideaTextGood      = "An ideal choice"  
ideaTextAwful    = "Not on my watch"  
ideaTextImpish   = "Fun!"  
ideaTextDull     = "Pedestrian."
```

# HOW TO WRITE READABLY

## Squint Test



# QUINT TEST



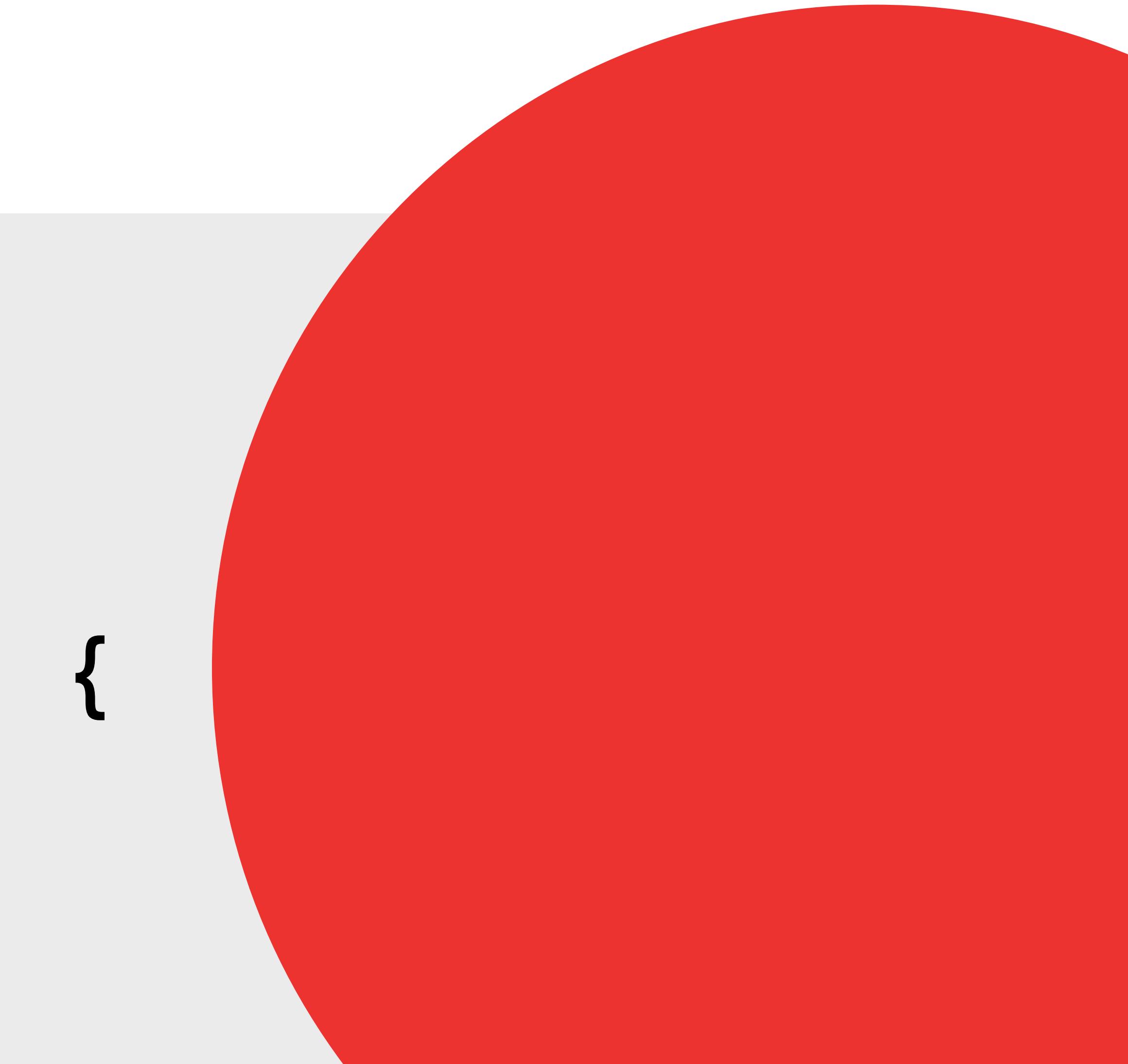
# Which parts are action?

# Which parts are **setting up**?

# Which parts could be abstracted?

# anti-pattern matching

!



```
if isOurLoveTrue &&
!IllFatedStar.willShine(tonight) {
```

! I l l



if portentsOfIllWill! [yourSign]

11! [

check for camouflage

**Help us pattern match.**

know your readers



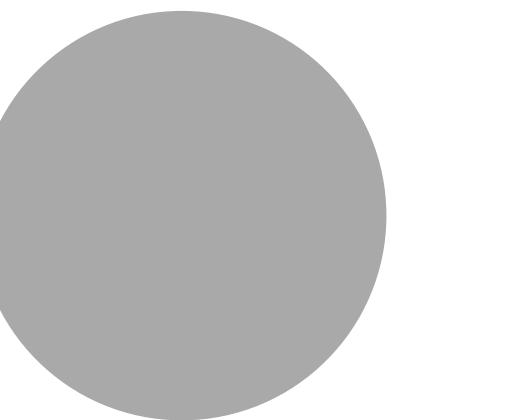
believe your readers

```
var settingsInteractor: SectionSettingsInteractor?
```

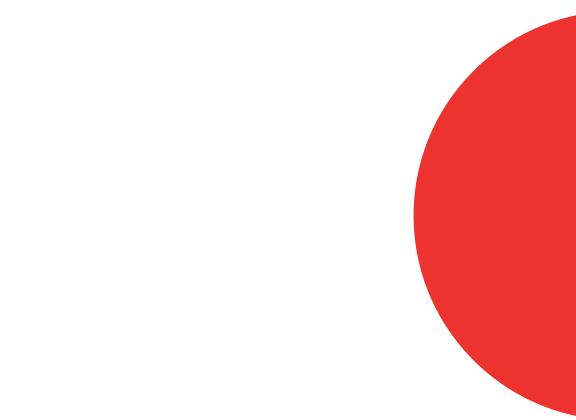
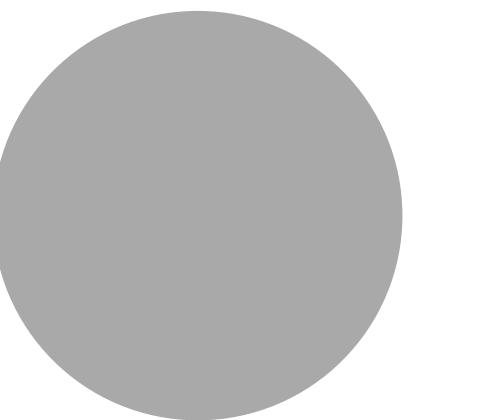
```
// Keep a reference to this interactor as long
// as the tab bar controller's alive
var settingsInteractor: SectionSettingsInteractor?
```

```
// Keep a strong reference to this interactor
// so it doesn't get deallocated while the tab
// bar controller's alive
var settingsInteractor: SectionSettingsInteractor?
```

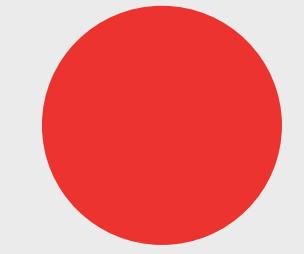
**“What's wrong with them?  
Why can't they read this code?**



**“What information are they missing  
that’s making it hard to read this code?**



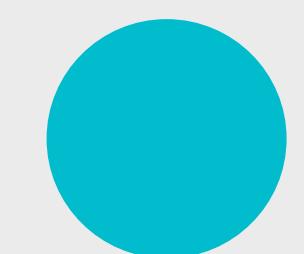
# HOW TO WRITE READABLE CODE?



Treat confusion as data.



Be predictable.

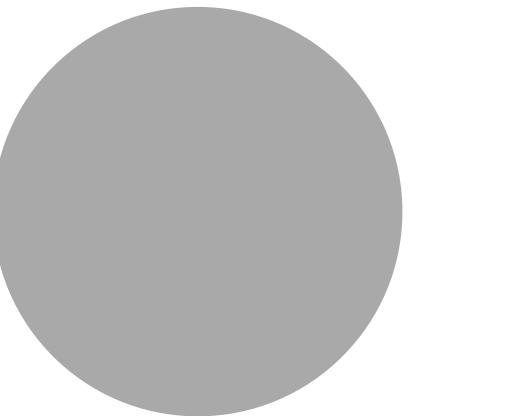


Empathize.



# 05 WHEN TO WRITE READABLY

**“I’m sorry for the long letter...  
I didn’t have time to write a short one.”**

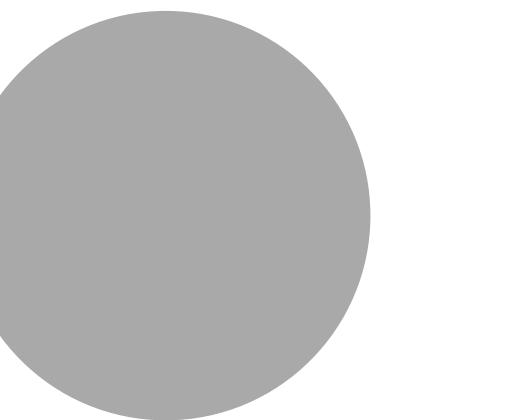


**“Mission critical code  
should not just be *arguably*,  
but *trivially correct*.”**



JPL Institutional Coding Standard for the C Programming Language

# Blocked fire escapes



# TALK IT OUT

- cognitive overhead      ● working memory
- tools for deciphering      ● patterns & intuition
- critical code paths

A large, solid red circle is positioned in the center-right area of the image, partially overlapping the white background.

Decipher less.  
Create more.



THANK YOU

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