

# How to Program As a Pair



# What This Lecture Covers



How pairing combines your minds into one super-mind.



How to drive



How to navigate



Specific instructions on how to work together effectively when things aren't going well.



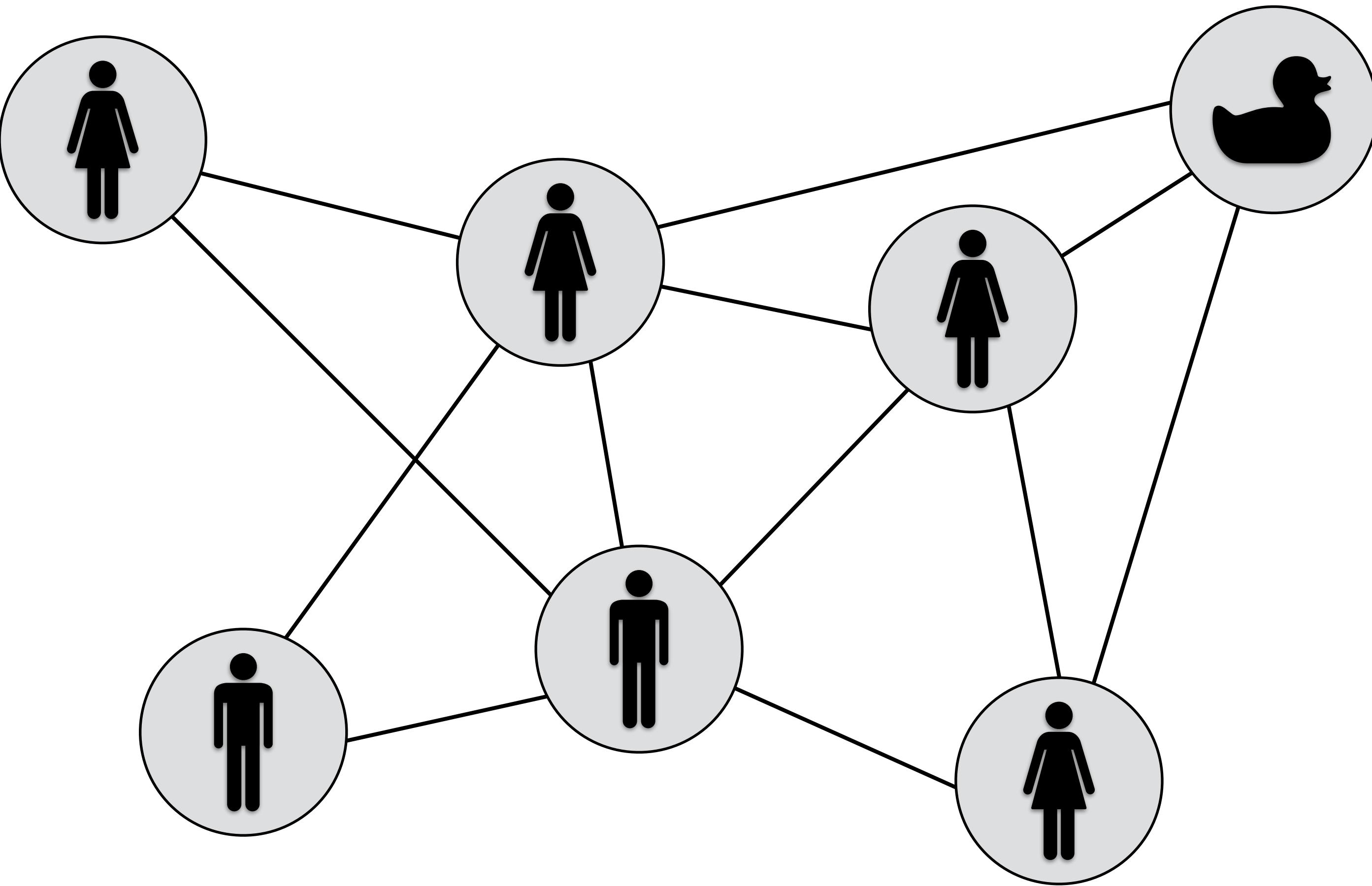


I am a rock.

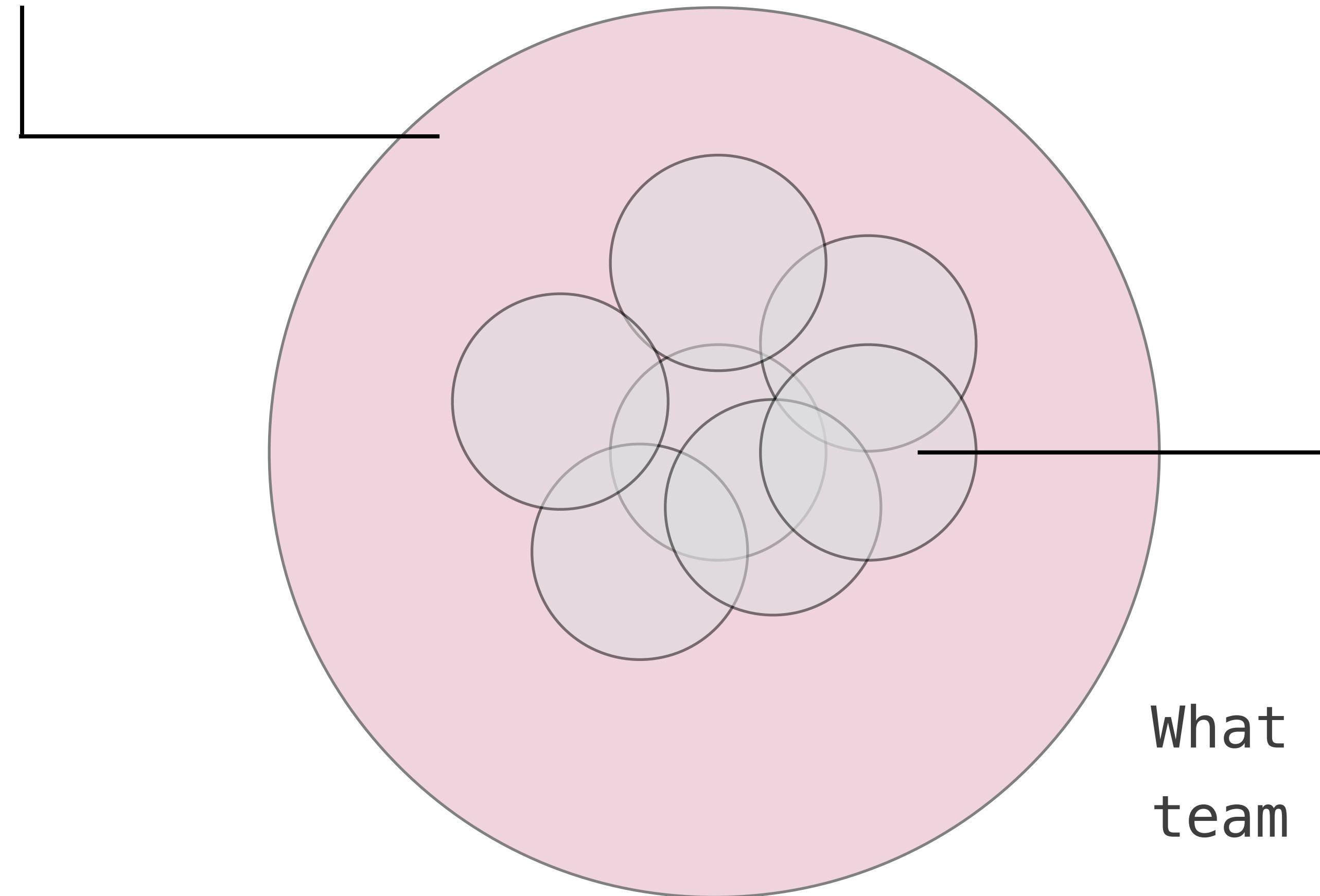




No programmer is an island.

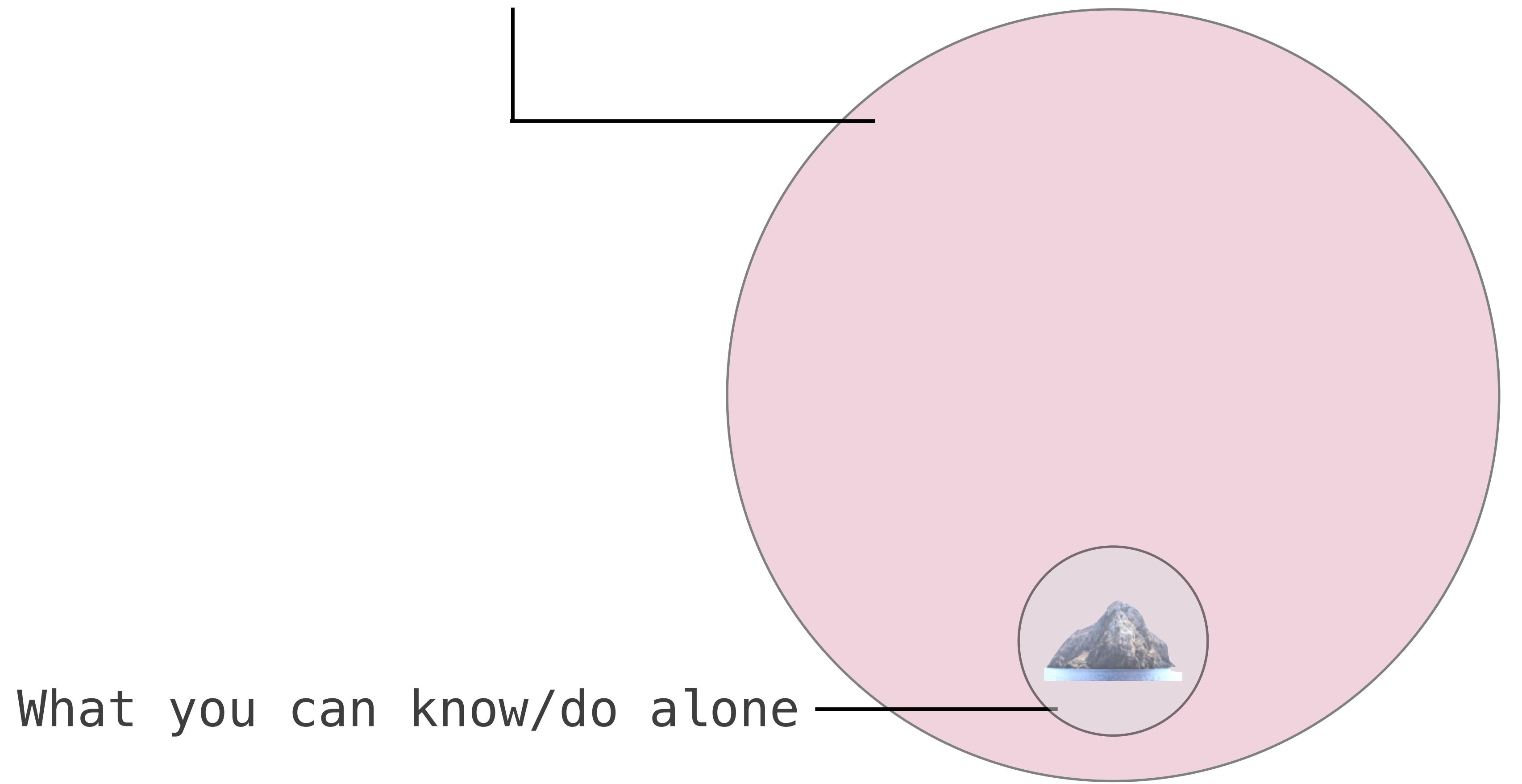


Everything that can be known/done.

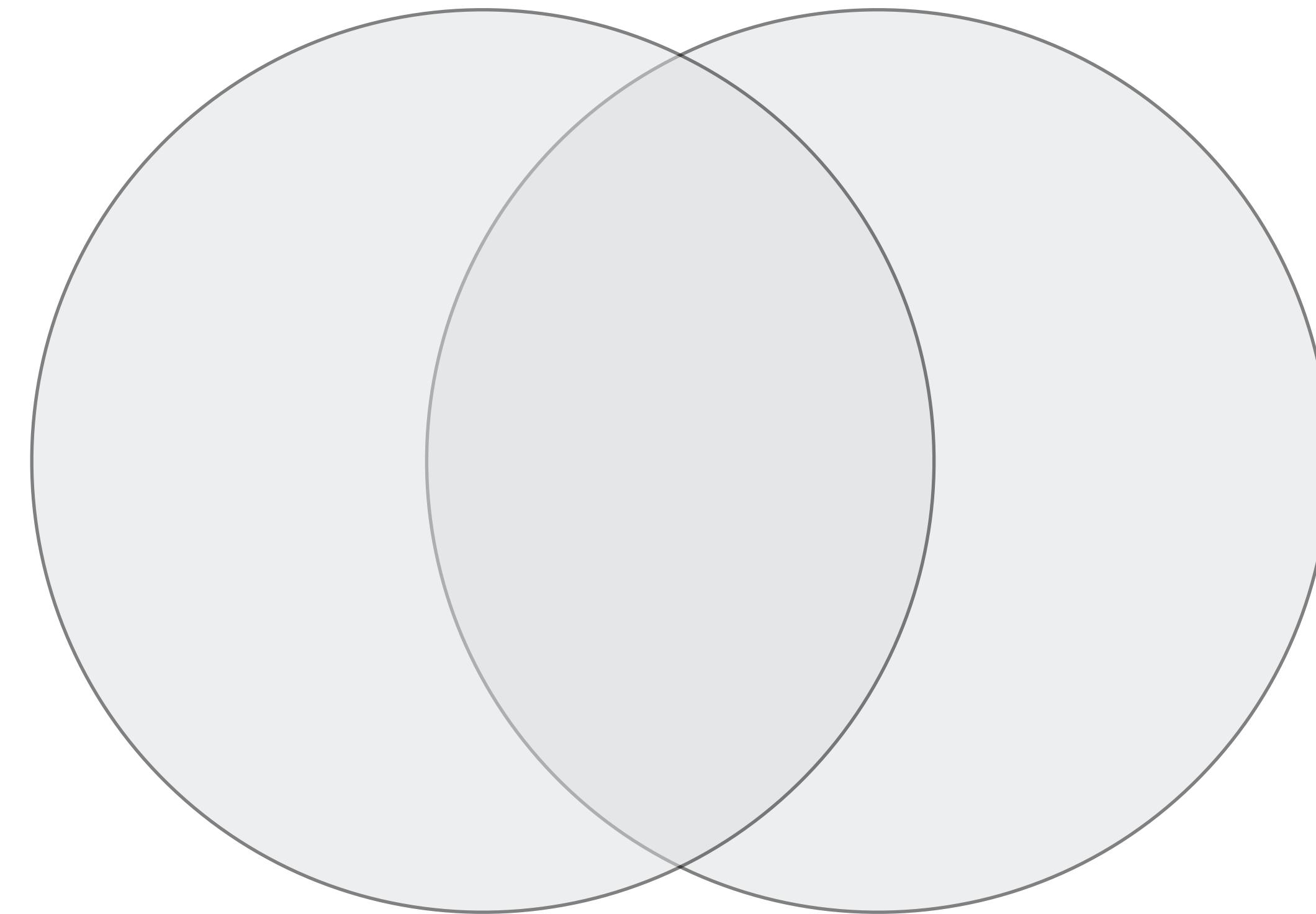


What each member of the team knows/can do.

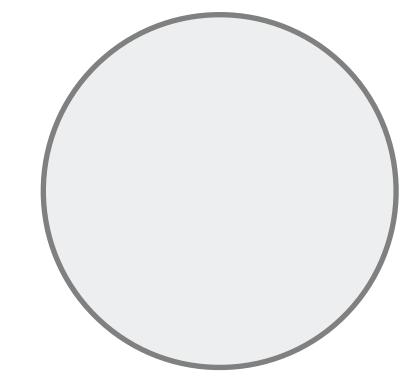
Everything that can be known/done.



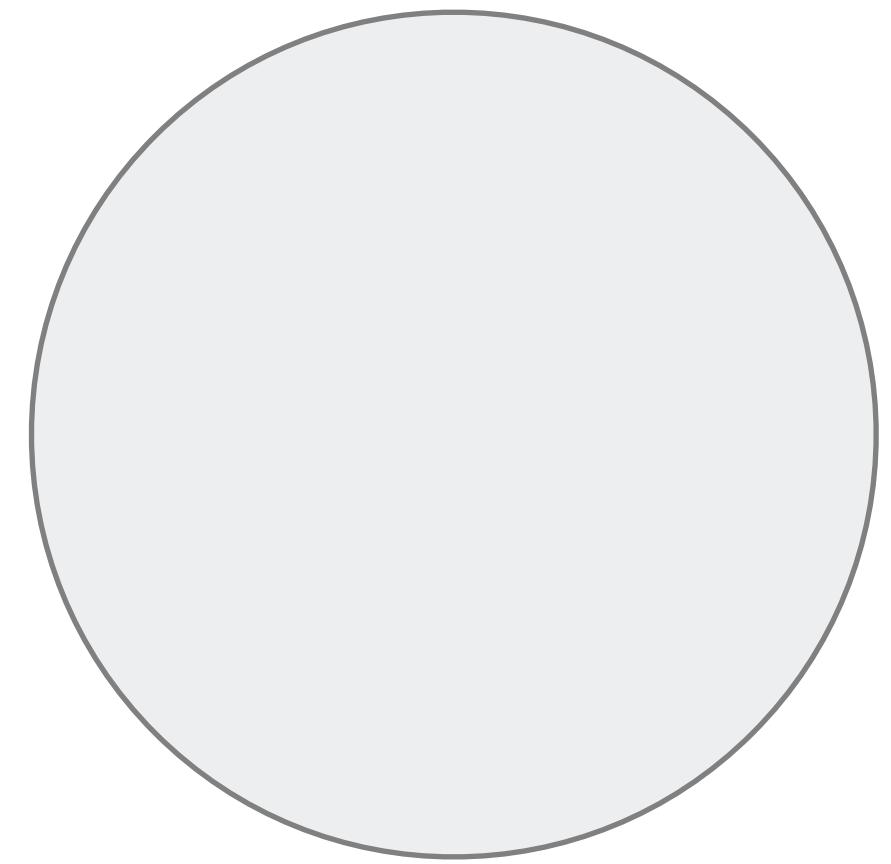
What you can know/do alone



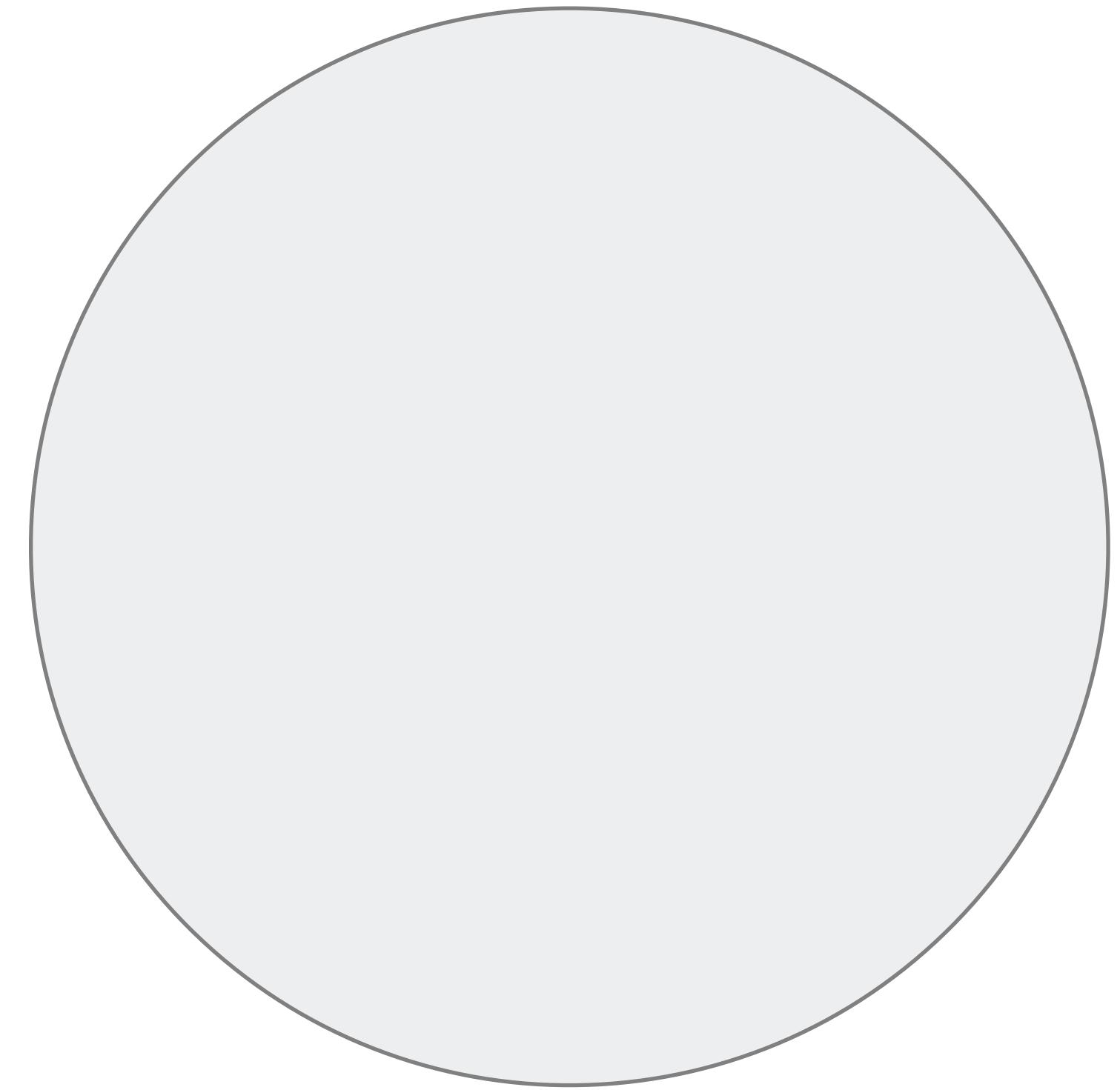
# Pair Programming



Novice



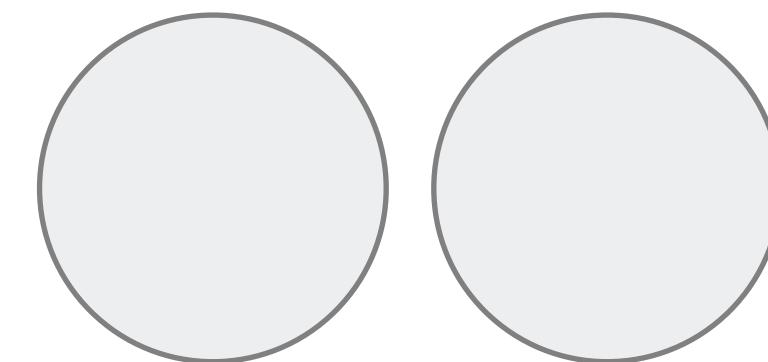
Intermediate



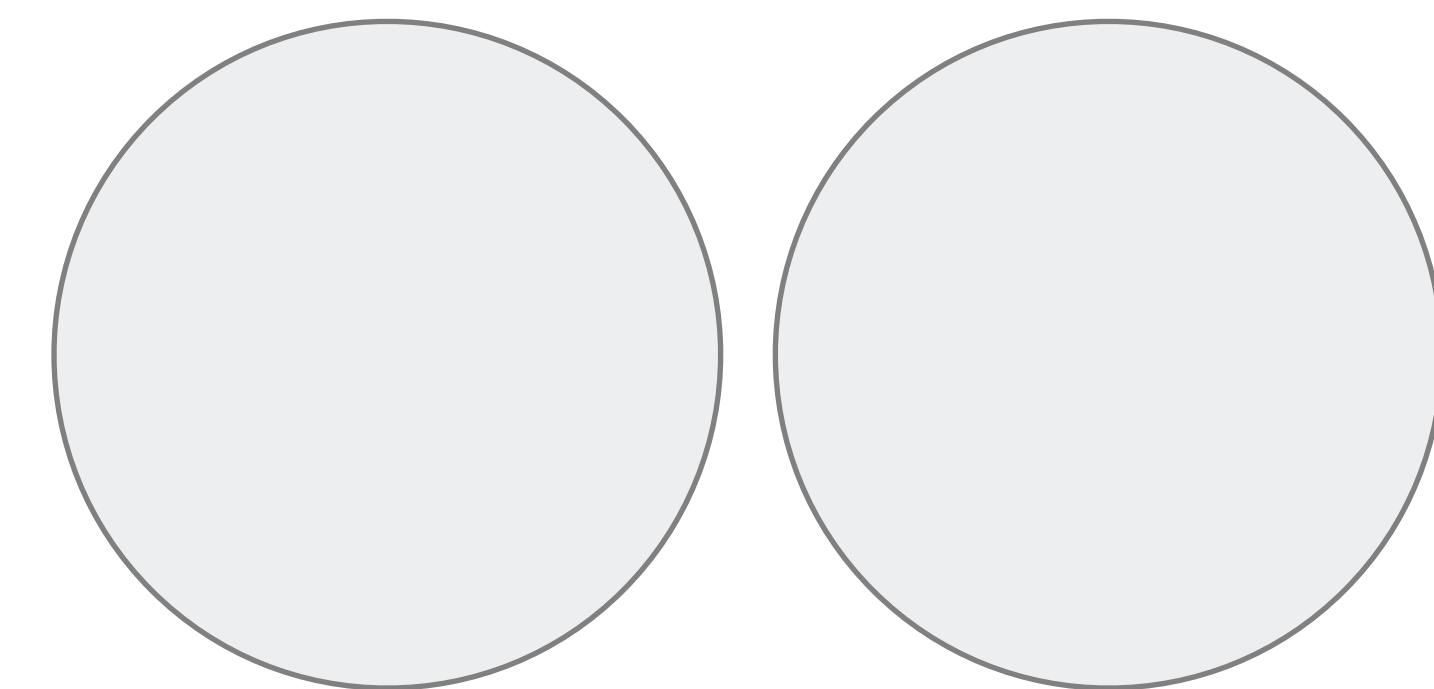
Expert



Novice-novice



Intermediate-intermediate



Expert-expert

# Let's Pair Up Right Now

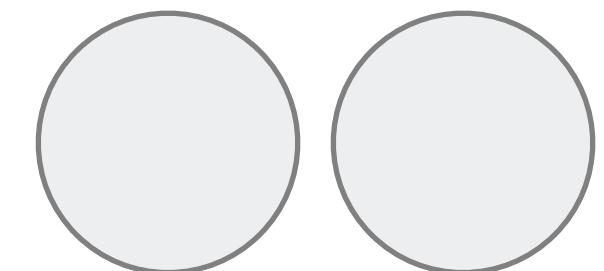
Discuss the following:

Which pair will see the least/most improvement  
vs a solo developer with the same experience?

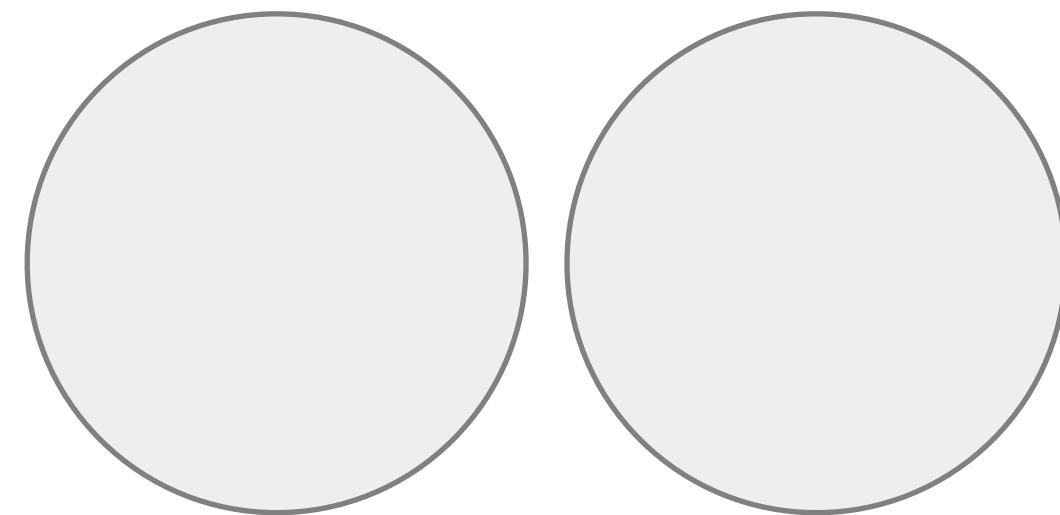
Why do you think that?



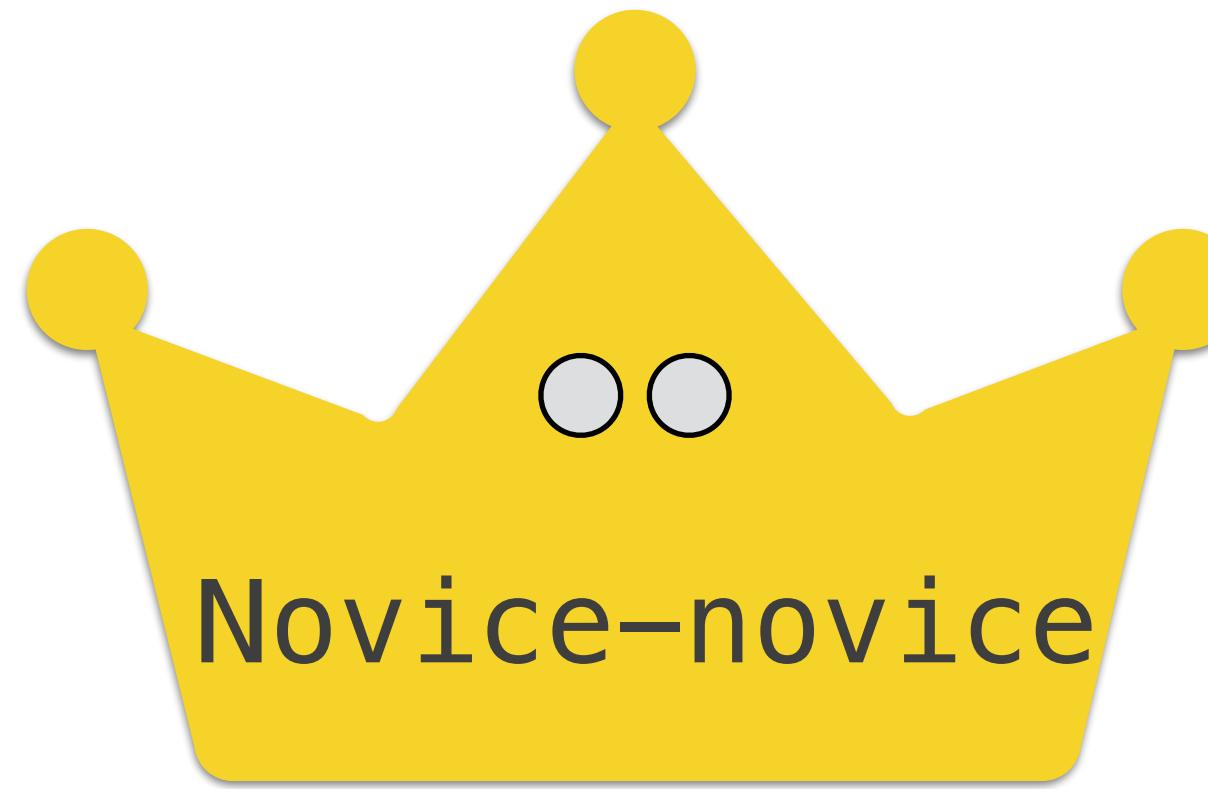
Novice-novice



Intermediate-intermediate



Expert-expert



The effectiveness of pair programming: A meta-analysis (2009)  
<http://www.ic.unicamp.br/~wainer/outros/systrev/30.pdf>

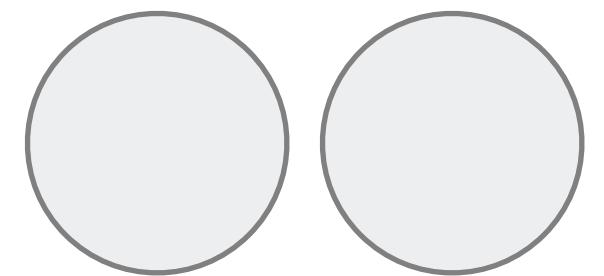
**Increase in program  
“correctness”**

**Simple work**

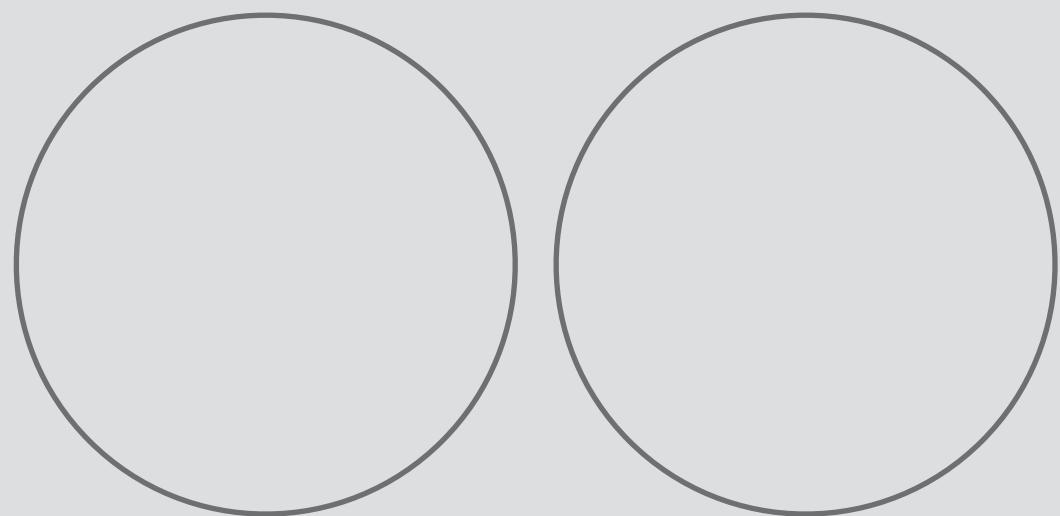
**Complex work**



Novice–novice



Intermediate–intermediate



Expert–expert

**Increase in program  
“correctness”**

**Simple work**

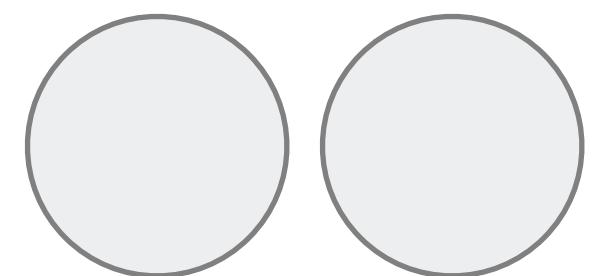
**Complex work**



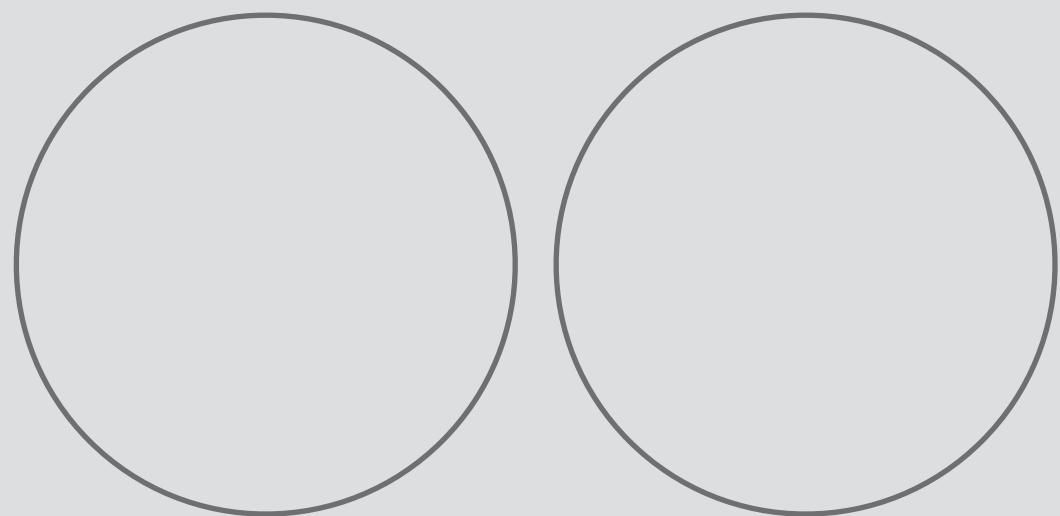
Novice–novice

**+32%**

**+149%**



Intermediate–intermediate



Expert–expert

## Increase in program “correctness”

Simple work

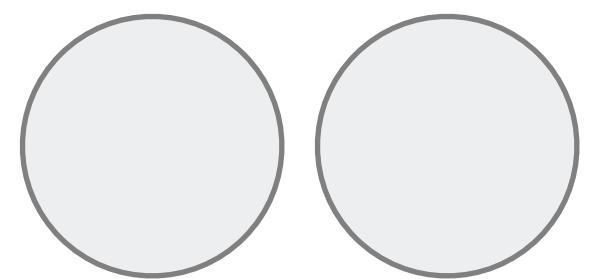
Complex work



Novice–novice

+32%

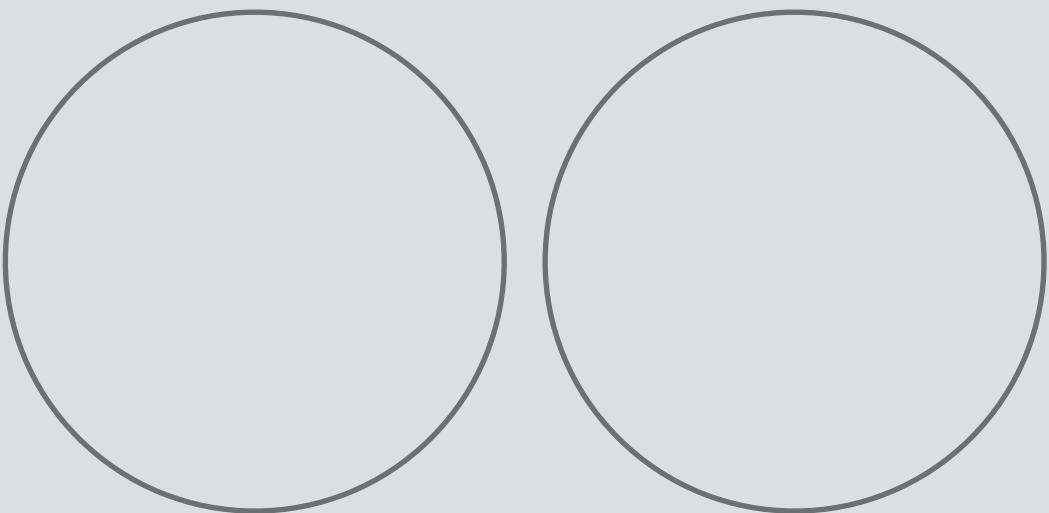
+149%



Intermediate–intermediate

-29%

+92%



Expert–expert

## Increase in program “correctness”

### Simple work

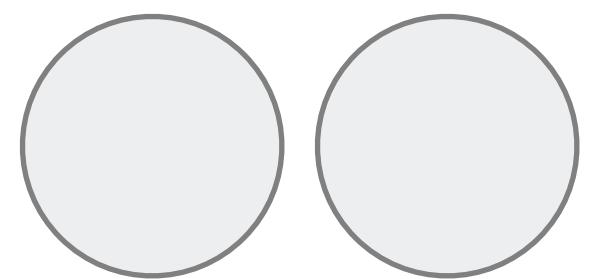
### Complex work



Novice–novice

+32%

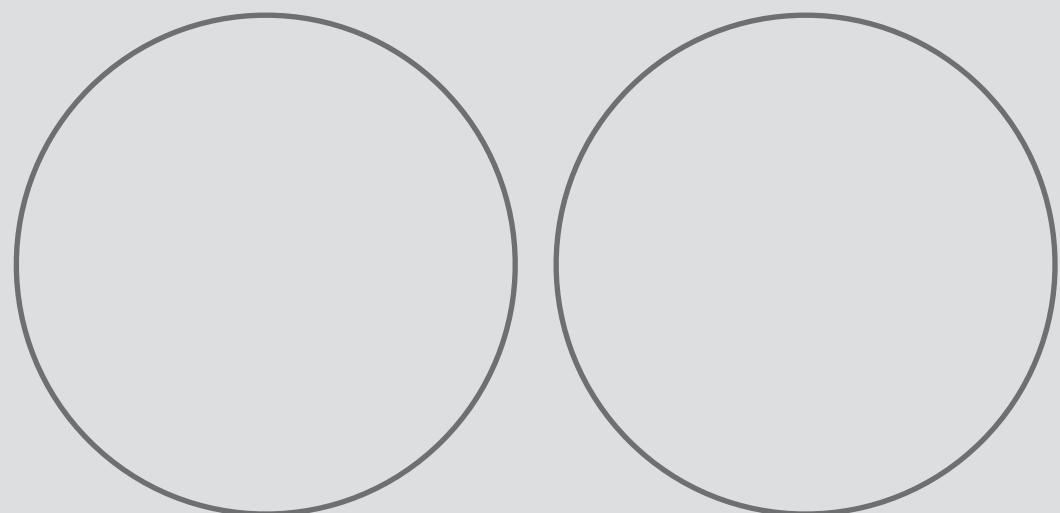
+149%



Intermediate–intermediate

-29%

+92%



Expert–expert

-13%

-2%

Increase in  
“correctness”



UberFacts ✅  
@UberFacts

Novice-r

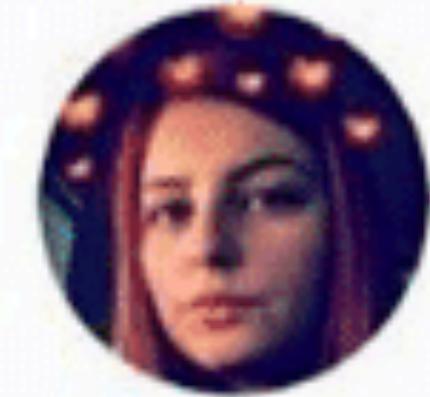
A study found that, when sober, rats prefer silence, but on cocaine, they prefer jazz.

ex work

149%

92%

Intermediate-i



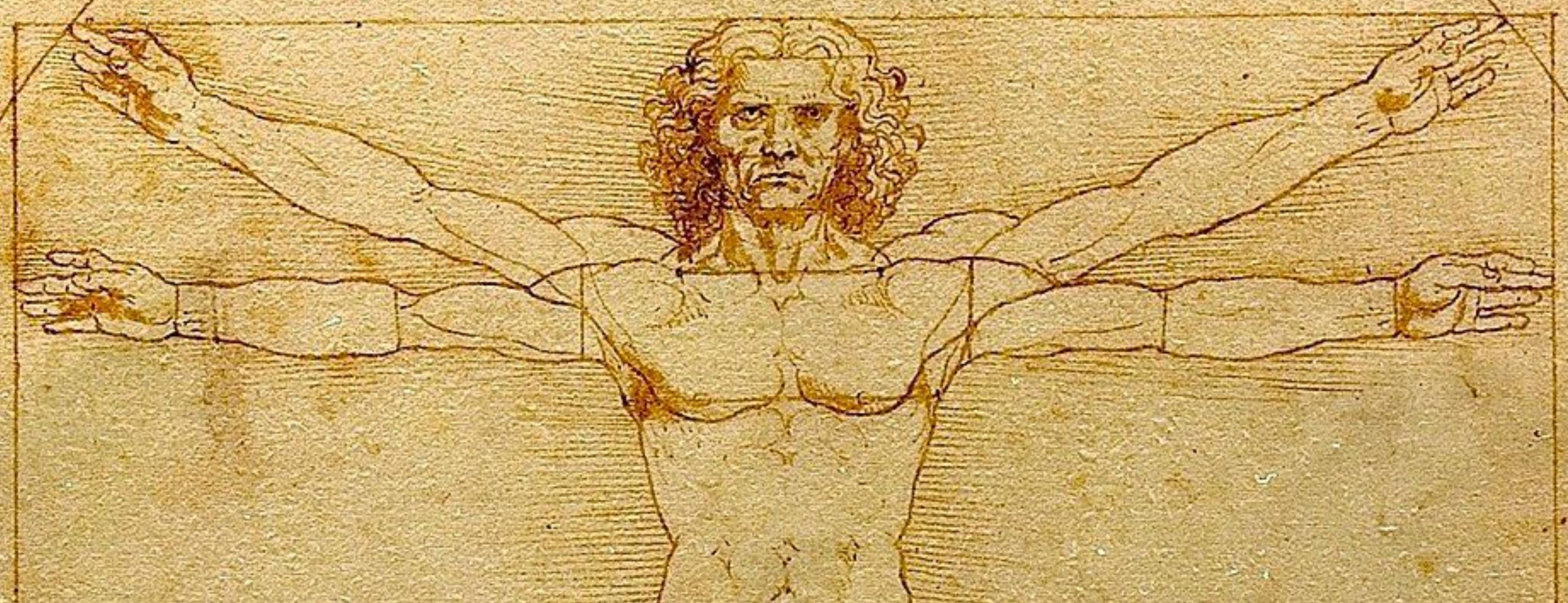
Alex ?  
 @\_vivid\_dreams

Expert-e

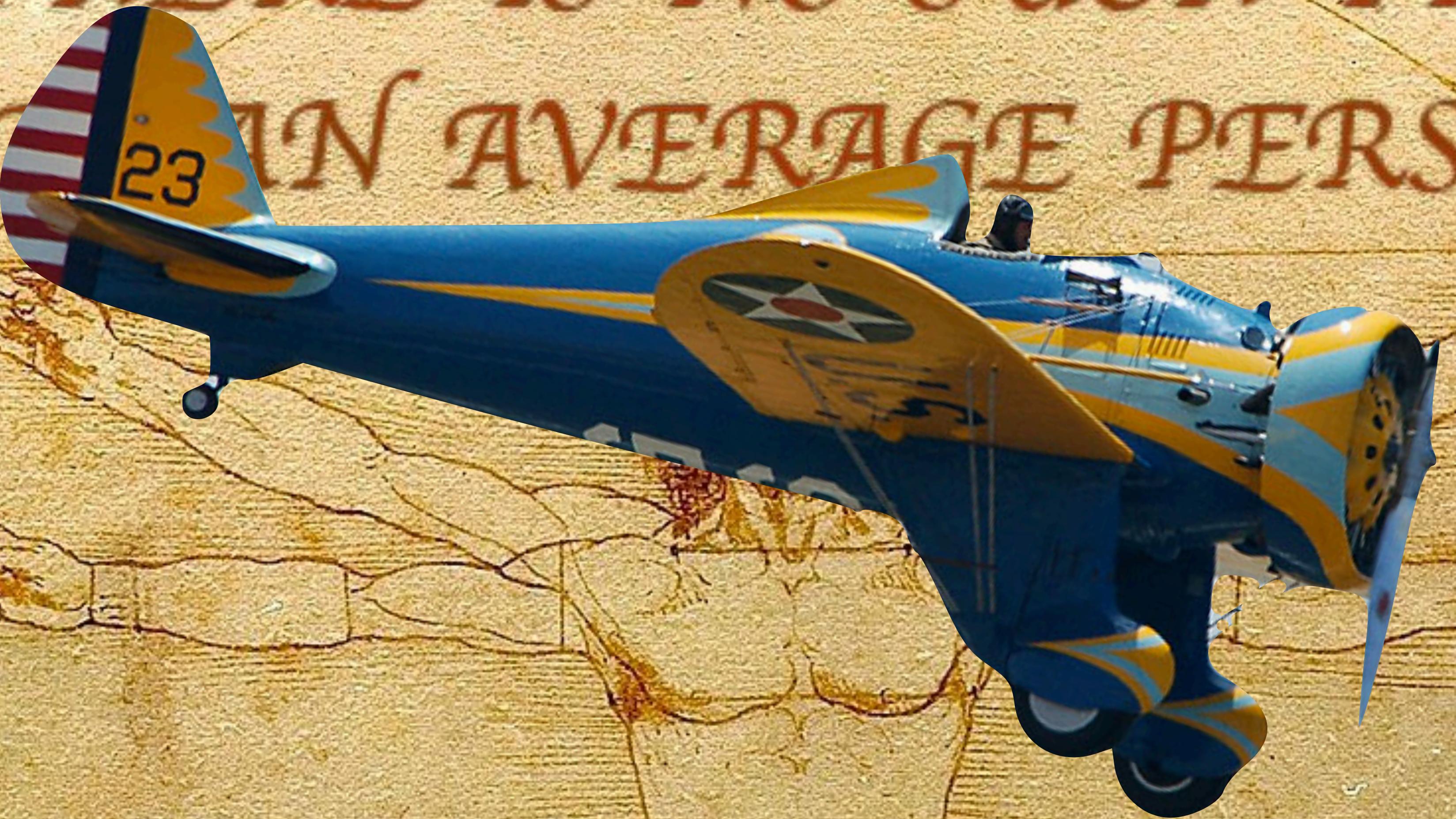
What do we do with this information

-2%

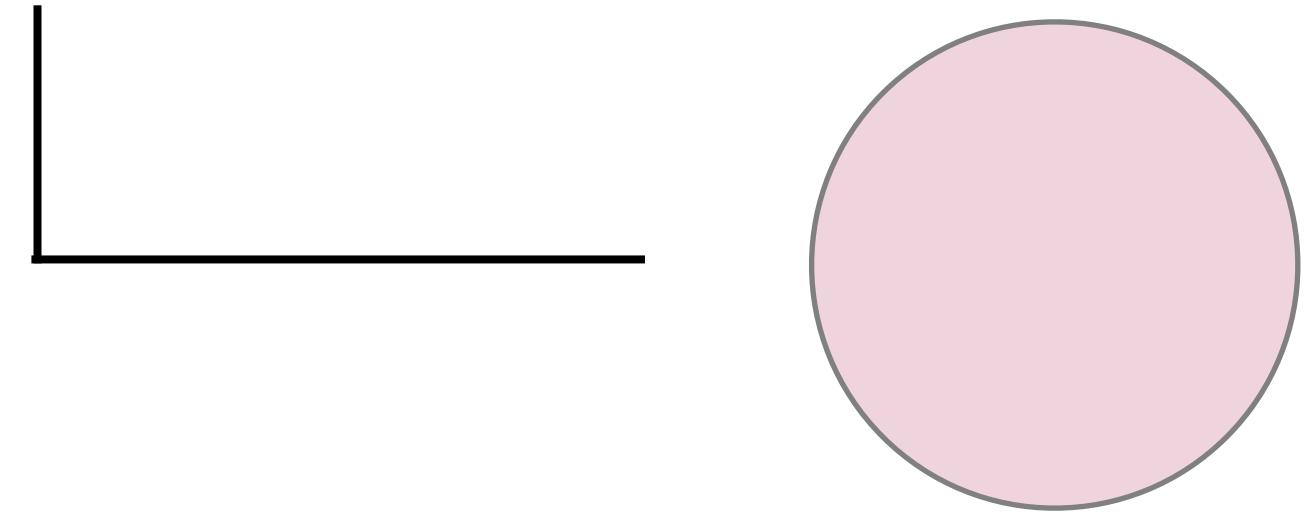
THERE IS NO SUCH THING  
AS AN AVERAGE PERSON



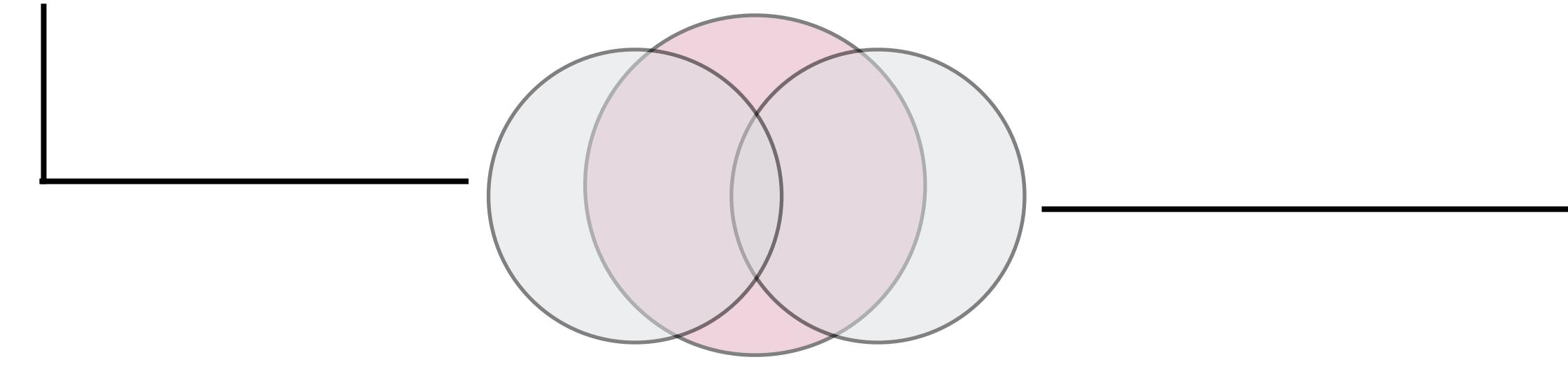
THERE IS NO SUCH THING  
IN AN AVERAGE PERSON



The difficulty of the problem.

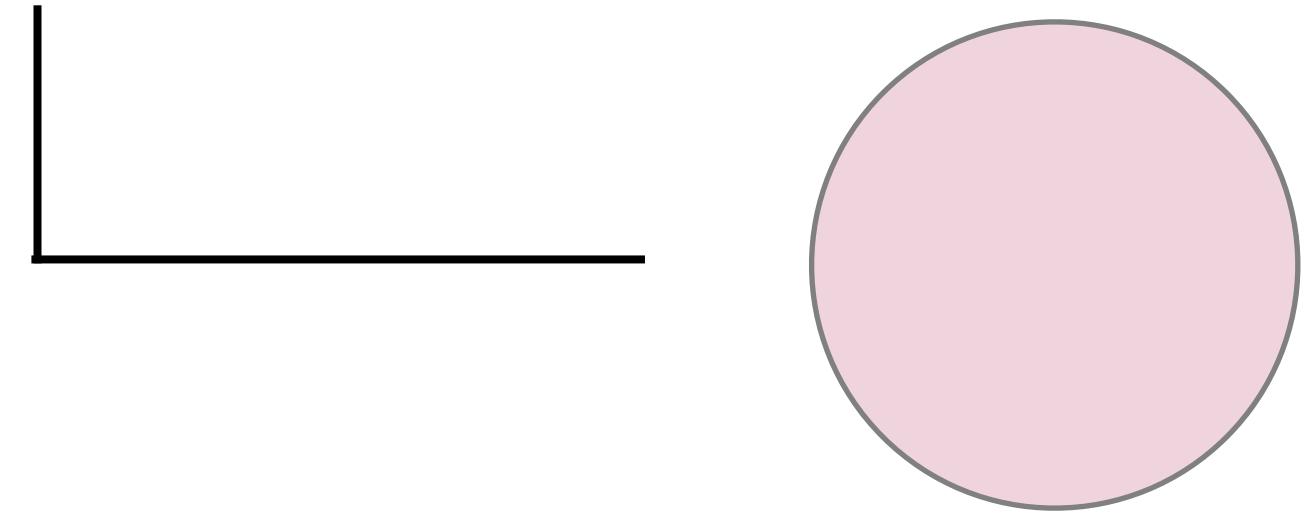


The difficulty of the problem.

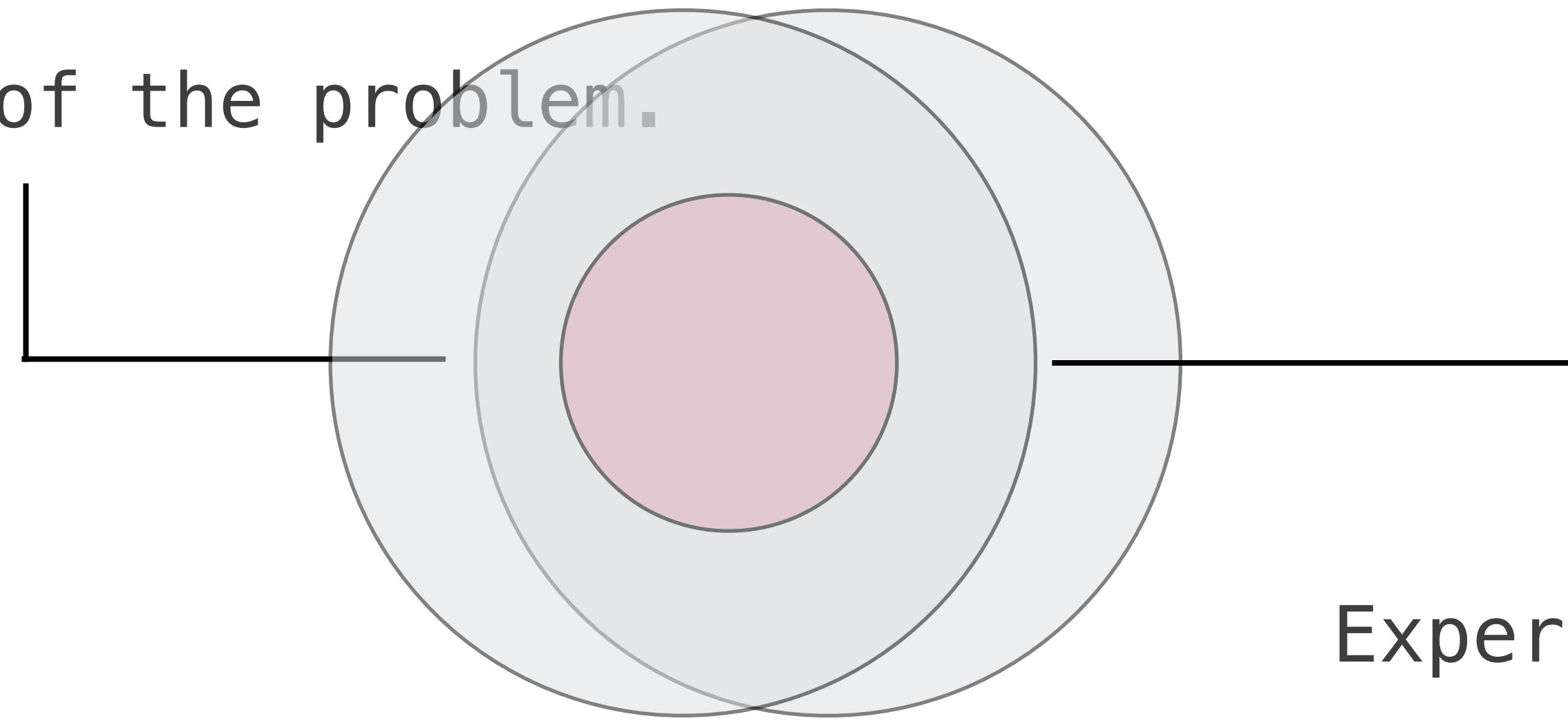


Novice–novice pair

The difficulty of the problem.

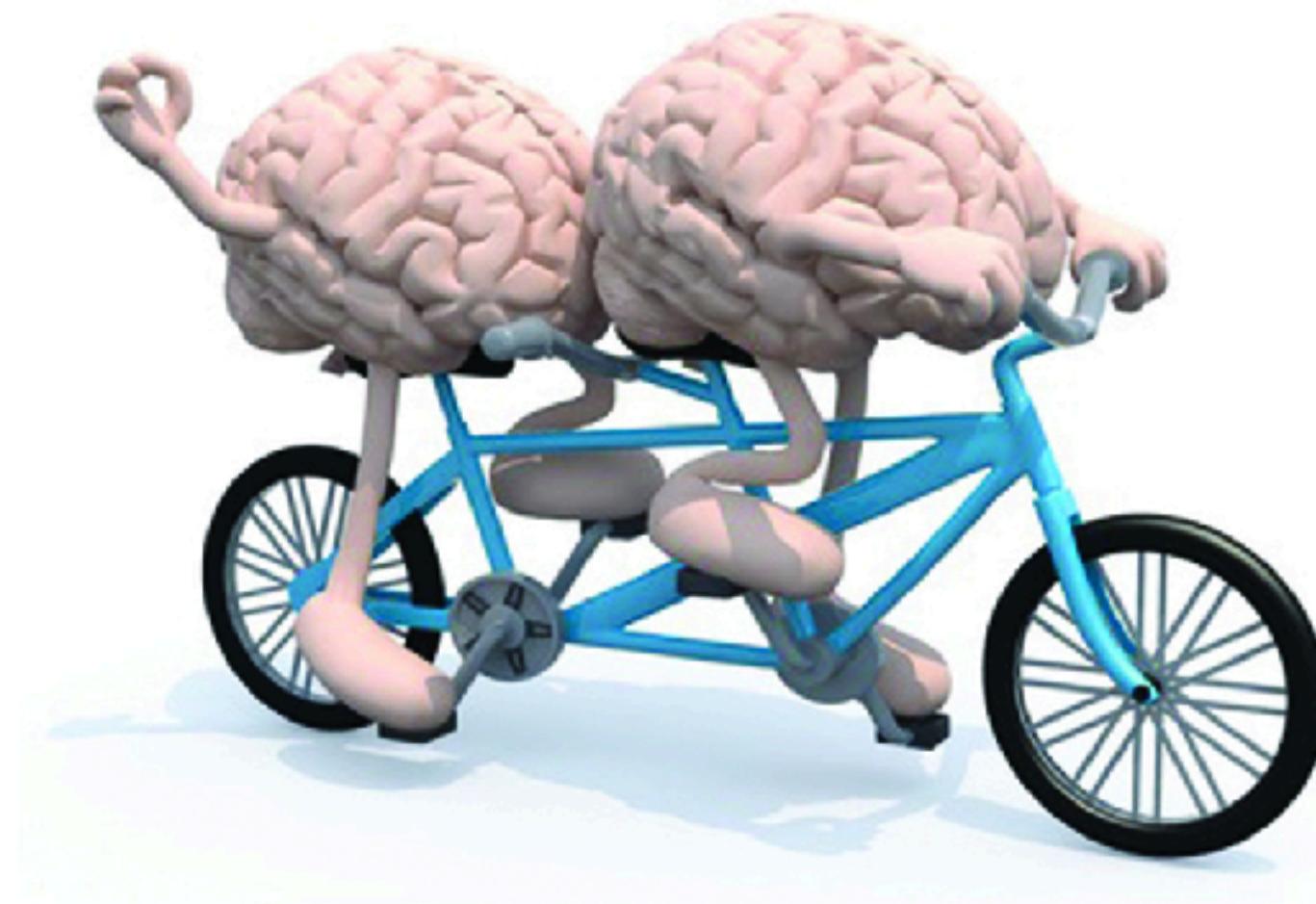


The difficulty of the problem.

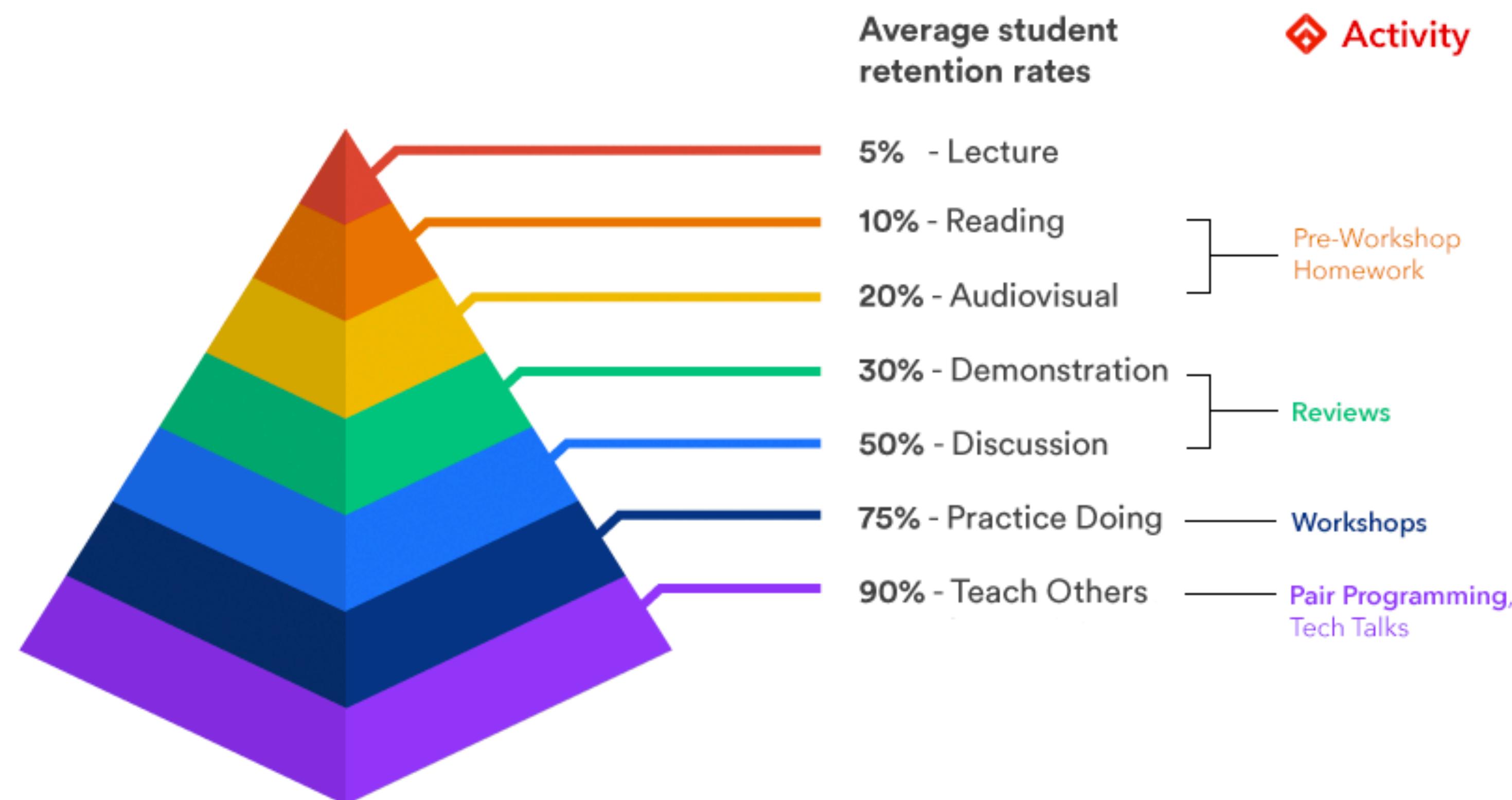


“If your brain is involved more than your hands  
having another brain is helpful.”

– Tess M. 1707

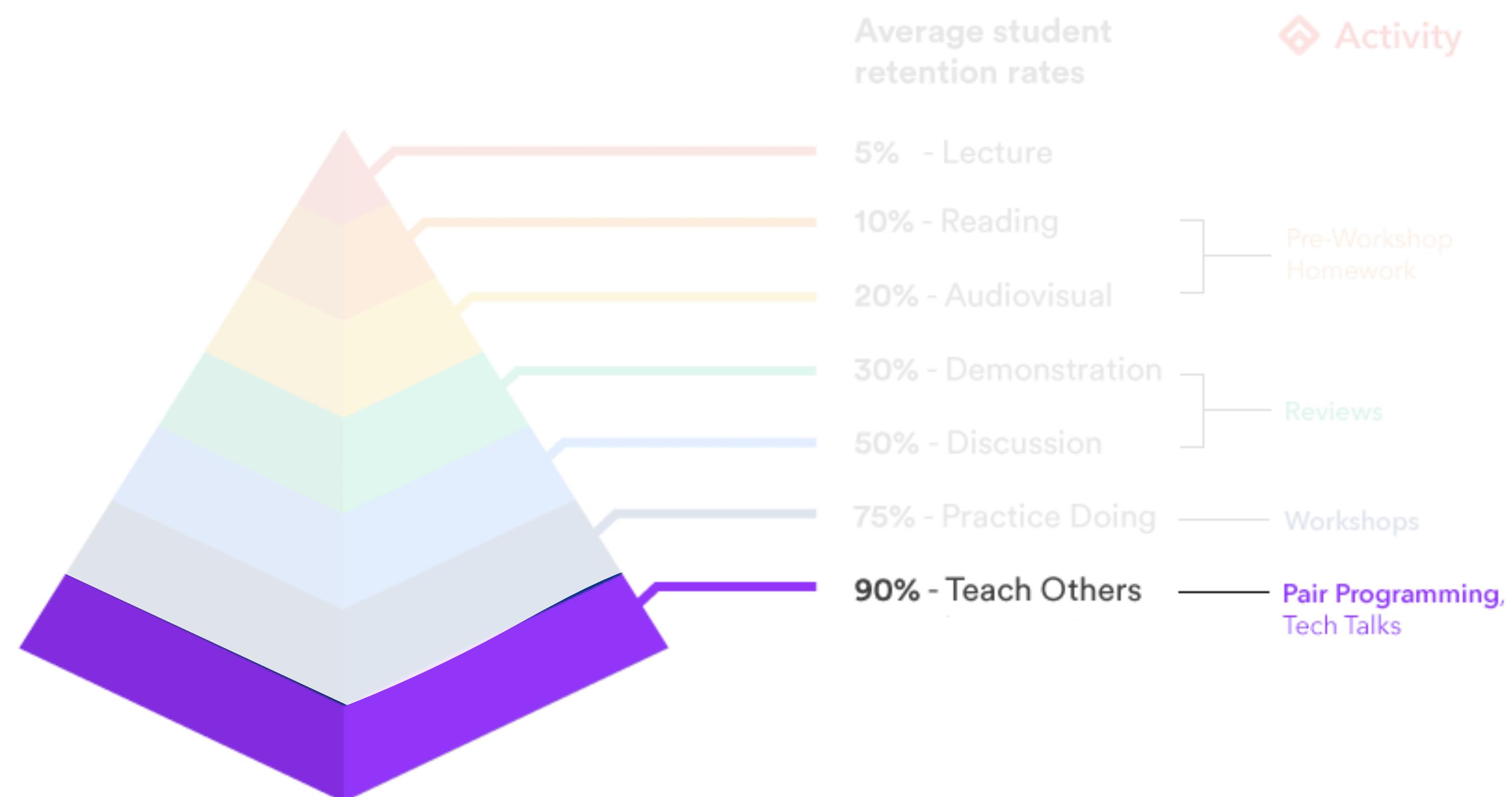


# Learning Pyramid @ Fullstack Academy

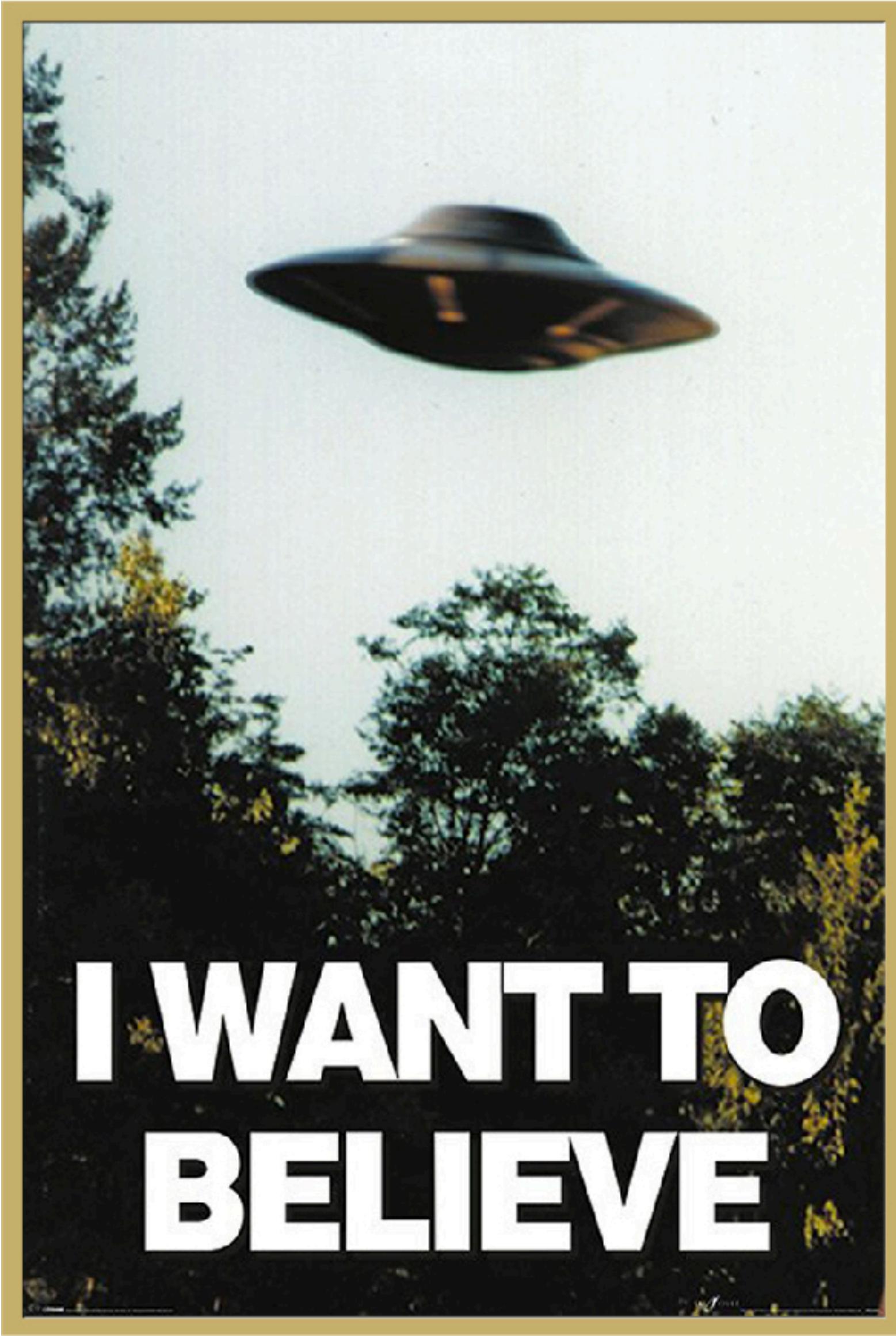


Source: National Training Laboratories, Bethel, Maine

# Learning Pyramid @ Fullstack Academy



Source: National Training Laboratories, Bethel, Maine



navigator



driver



# navigator

- Spots syntax issues
- Reads the docs
- Sees the big picture
- Speaks at a high level



# driver



- Writes code
- Asks clarifying questions
- Works the details

A photograph of a playground scene. On the left, a woman with red hair, wearing a dark hoodie and jeans, sits on a tire swing. On the right, a man in a black hoodie and dark pants sits on a long wooden seesaw. The seesaw is tilted, with the man's end lower than the woman's end. The playground is set in a grassy area with a brick wall in the background.

unbalanced  
pairs

# Dance of the Little Swans



# Dance of the Little Swans



# Let's Pair Up Right Now

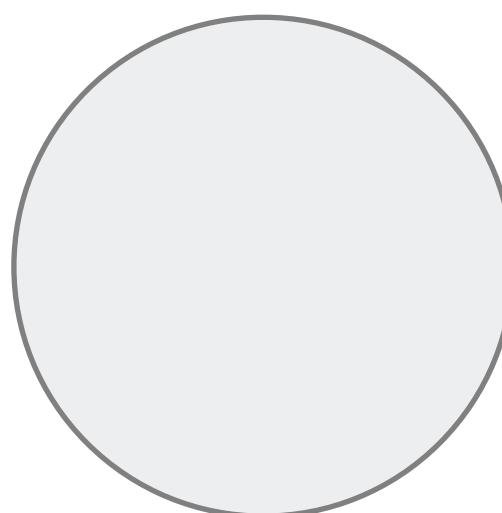
Discuss the following:

How might it effect the pairing session if the participants have different experience levels?

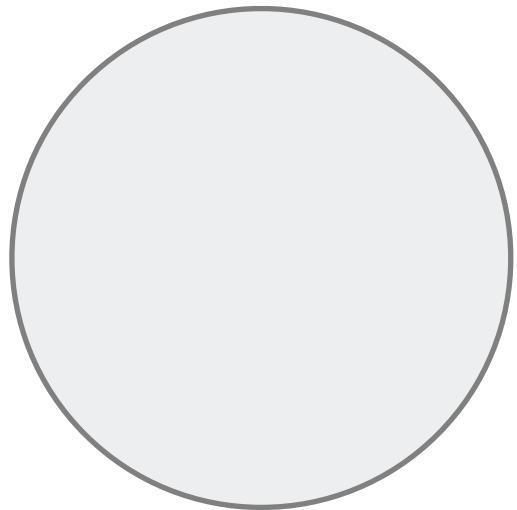
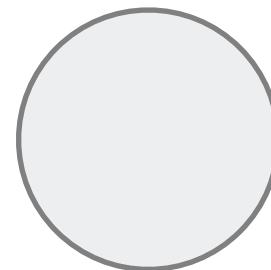
How is it different if the Driver or the Navigator is the stronger participant?

What can be done to mitigate these issues?

Driver



Navigator





## DETRIMENTAL NAVIGATOR



- 💀 Grabs the keyboard
- 💀 Dictates code
- 💀 Checks out

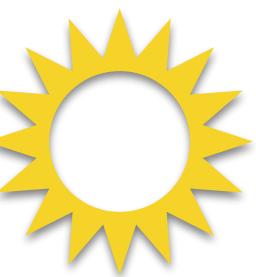




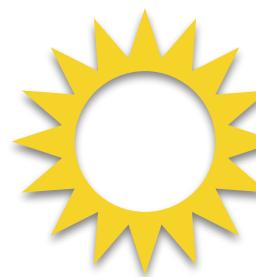
## DETRIMENTAL DRIVER



- 💀 Speeds ahead
- 💀 Ignores navigator
- 💀 Won't revisit code

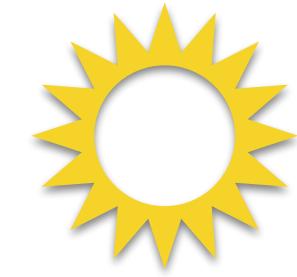


EXCELLENT  
NAVIGATOR

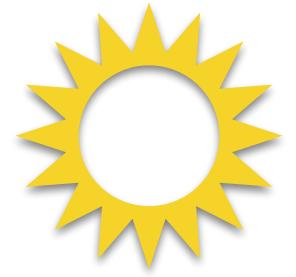


- Diagrams the approach
- Confirms understanding
- Stays engaged





## GREAT DRIVER



- Narrates their typing
- Confirms understanding
- Keeps steady pace



navigator

driver

# One set of hands on the keyboard





**Bring a brick,  
not a cathedral.**





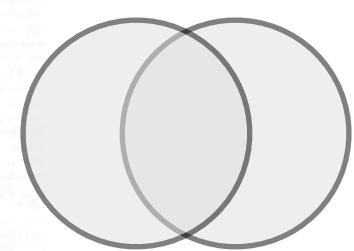
**Bring a brick,  
not a cathedral.**



A close-up photograph of a white and black cat sleeping peacefully on a computer keyboard. The cat's head is resting on the left side of the keyboard, with its eyes closed and a pink tongue slightly visible. Its front paws are tucked under its chin. The keyboard is light-colored with dark lettering. In the background, a computer monitor is visible, showing a desktop environment with icons and a window titled "Gentoo Linux".

# Stay Awake

# Things You Learned



Pairing combines your minds into one super-mind.



How to navigate

How to drive



Specific instructions  
on how to work together effectively  
when things aren't going well.

