

# How to Program As a Pair



# What This Lecture Covers



How pairing combines your minds  
into one super-mind.



How to navigate

How to drive



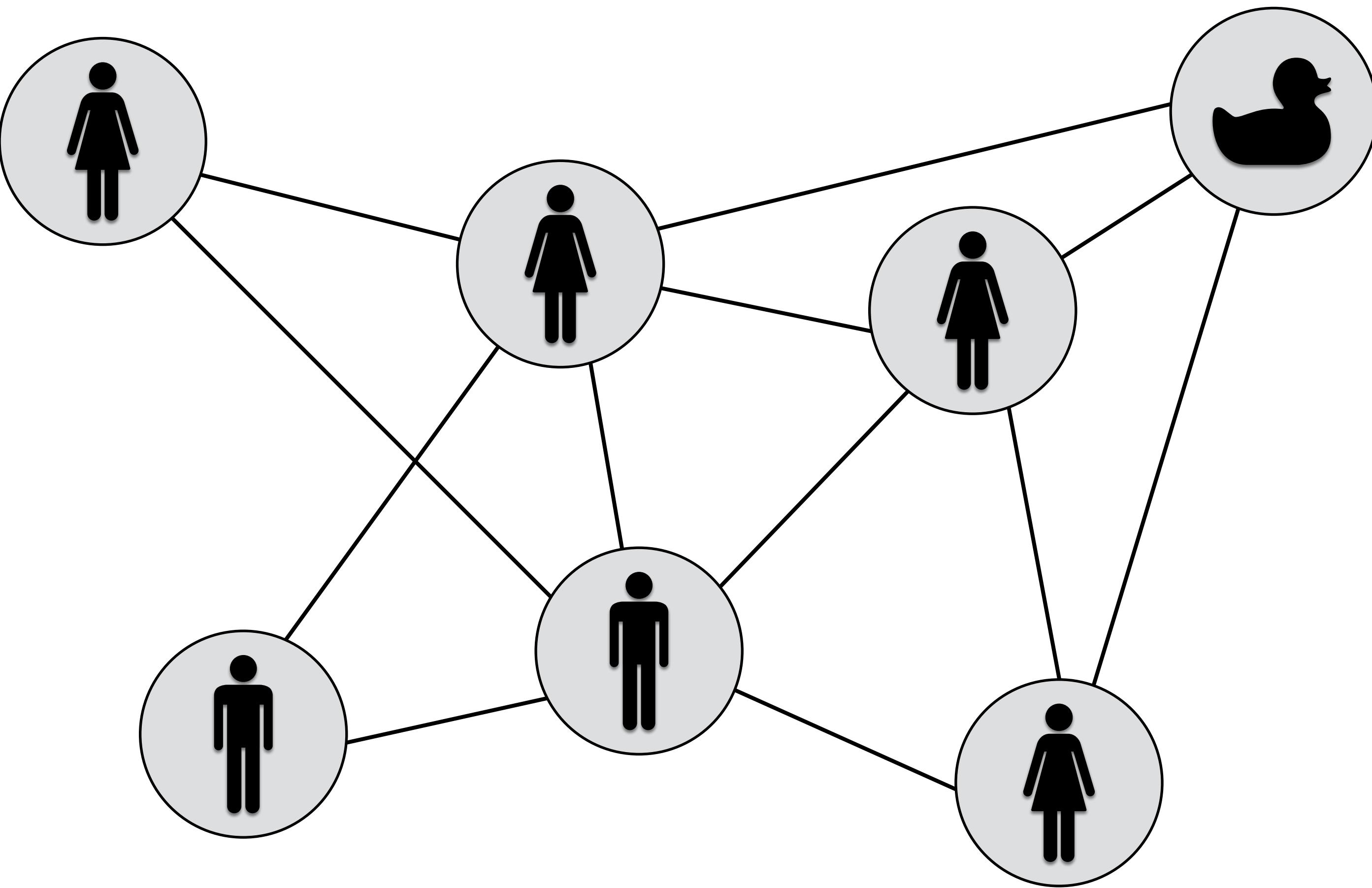
Specific instructions  
on how to work together effectively  
when things aren't going well.



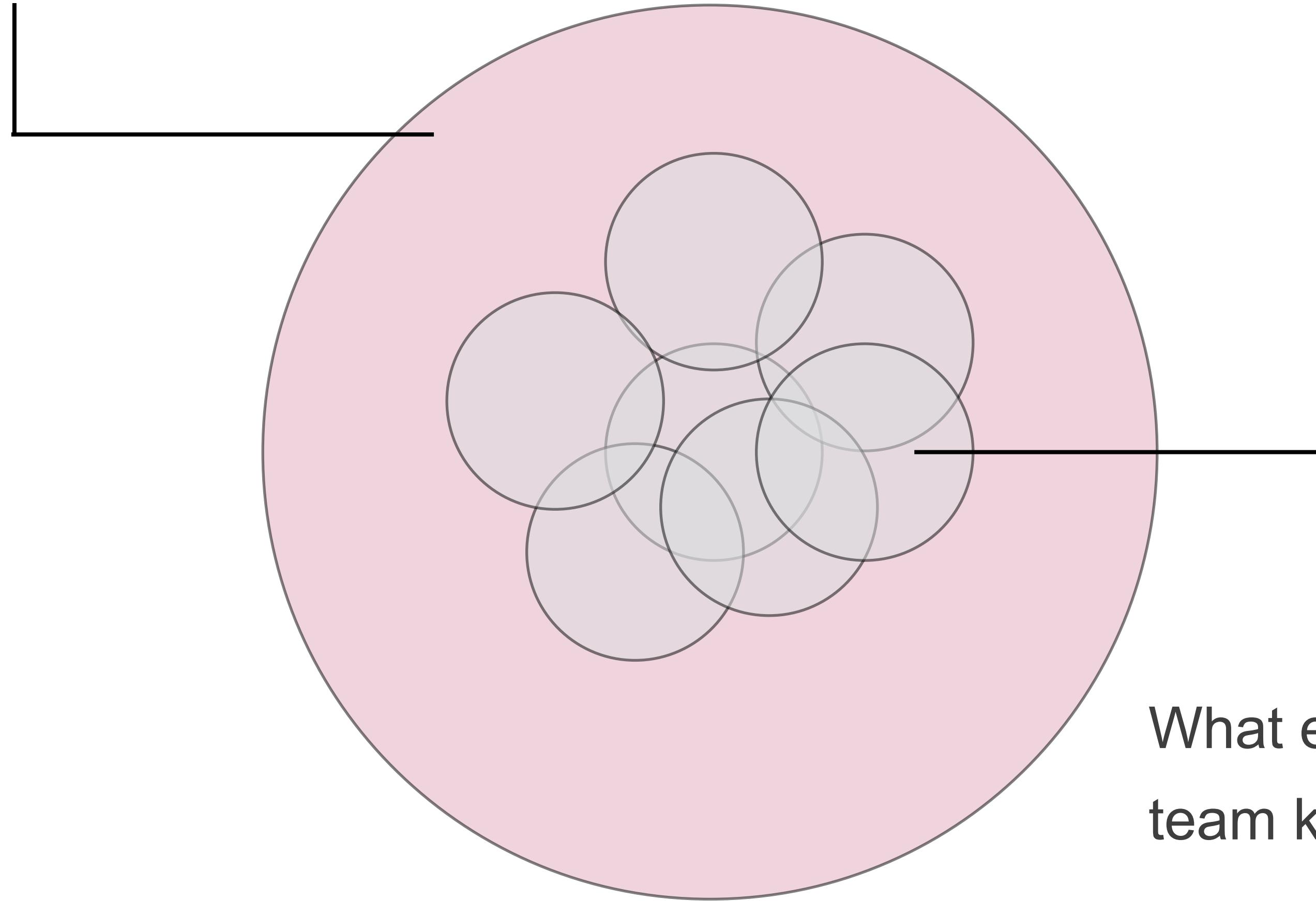




No programmer is an island.

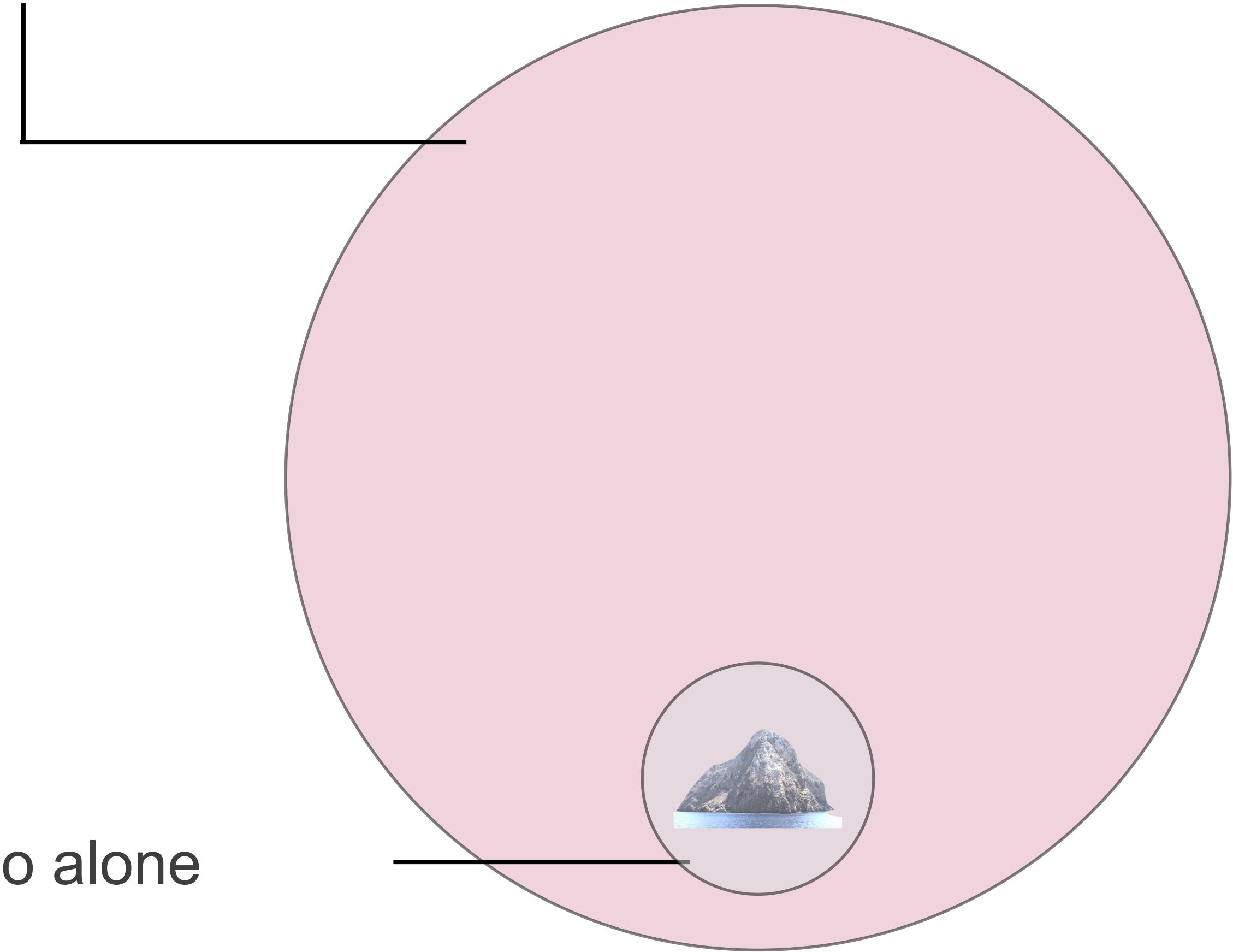


Everything that can be known/done.

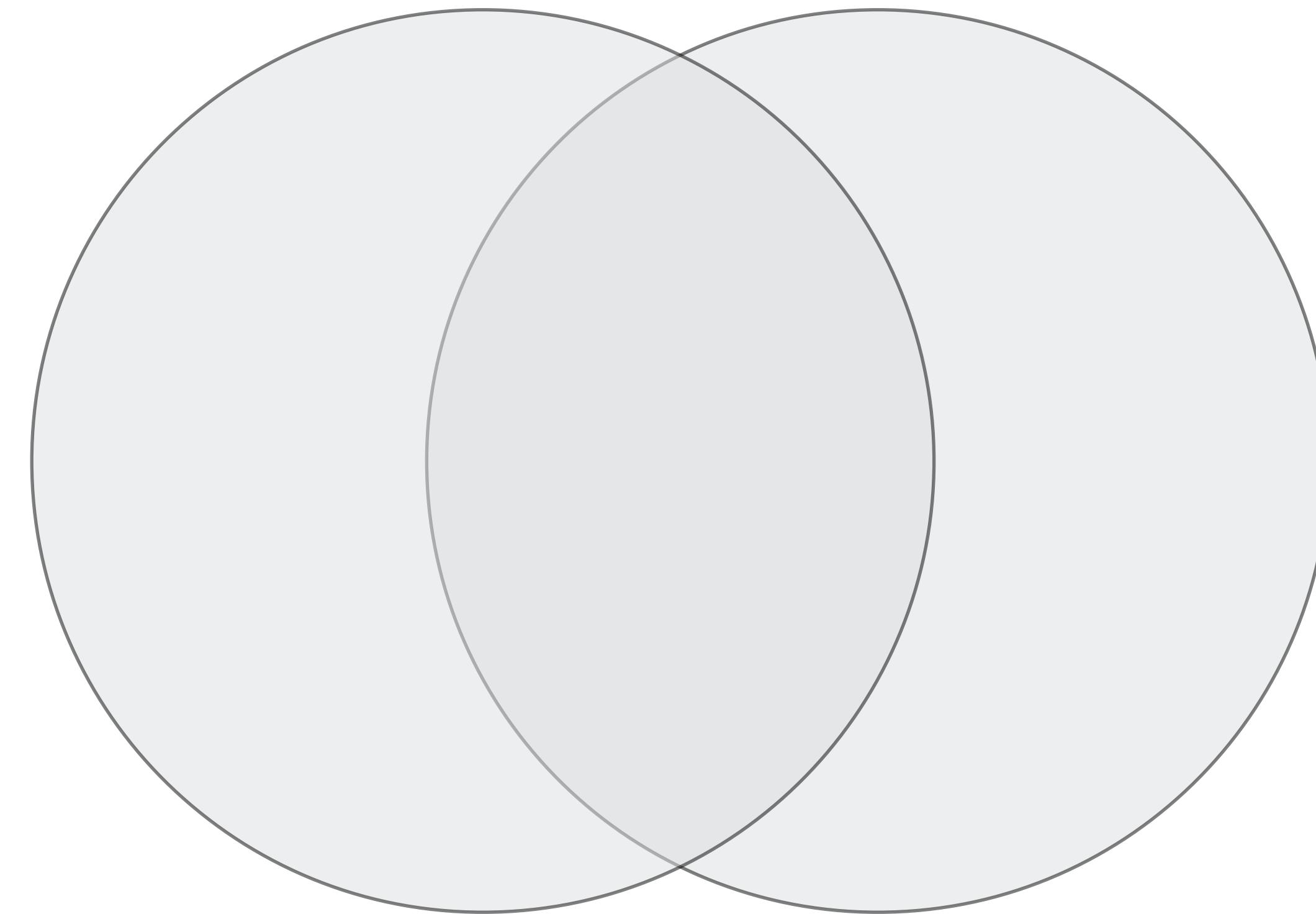


What each member of the  
team knows/can do.

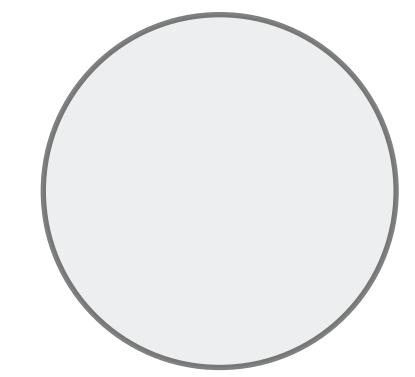
Everything that can be known/done.



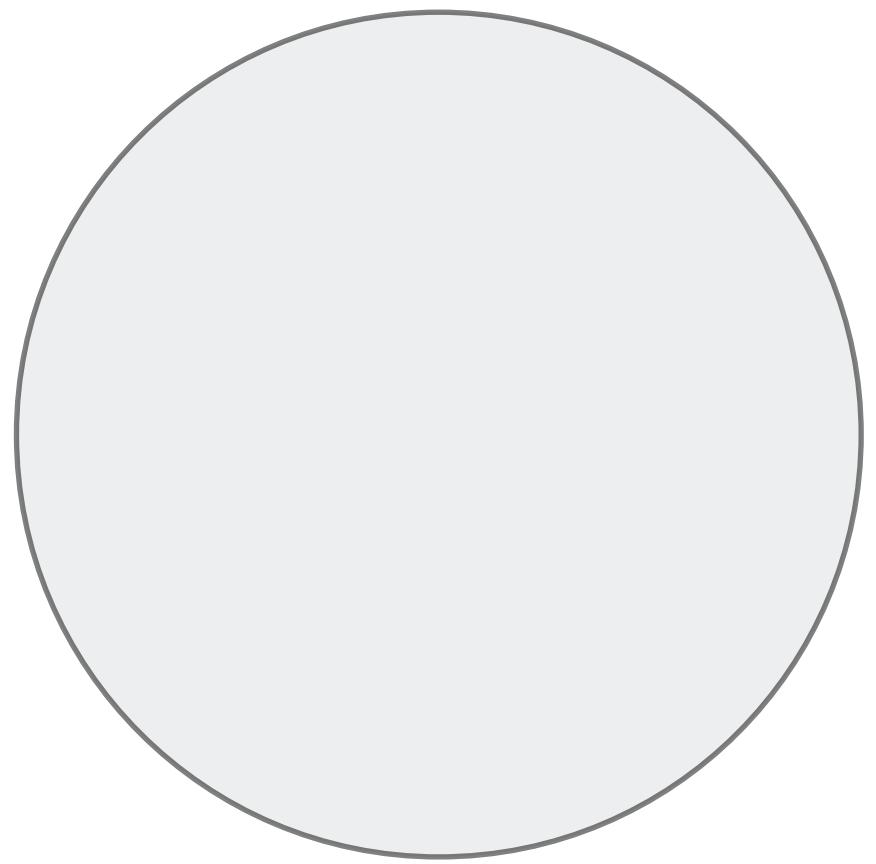
What you can know/do alone



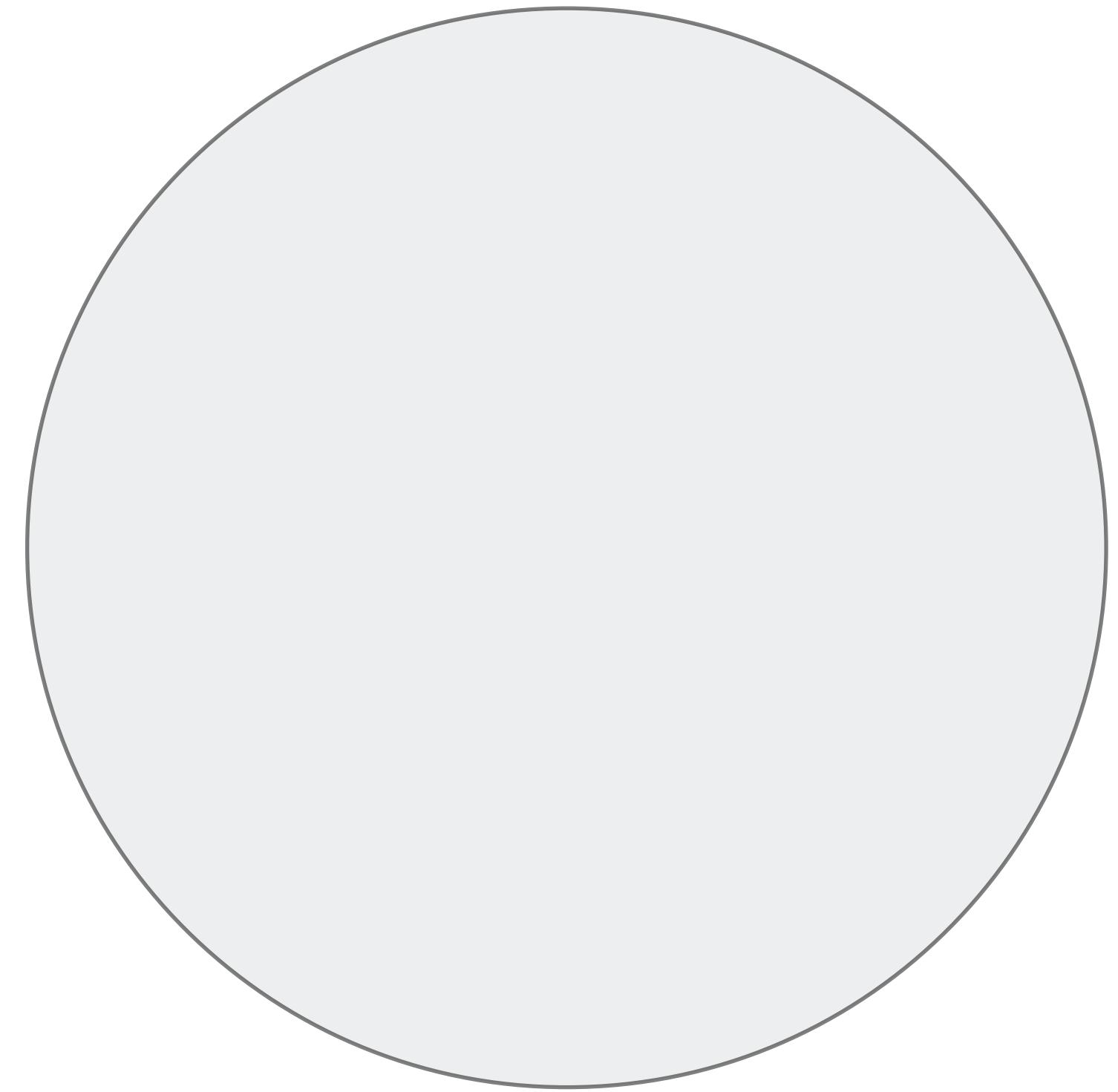
# Pair Programming



Novice



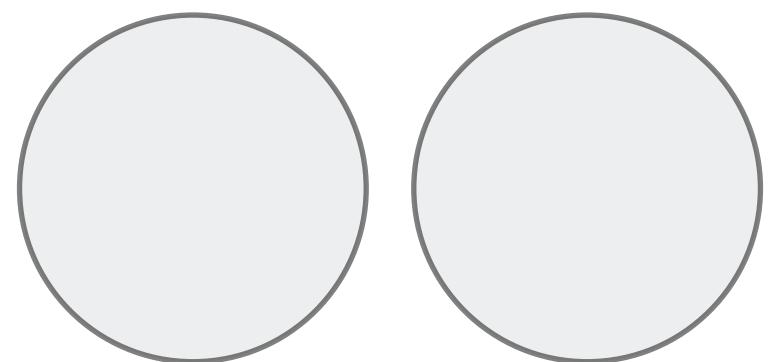
Intermediate



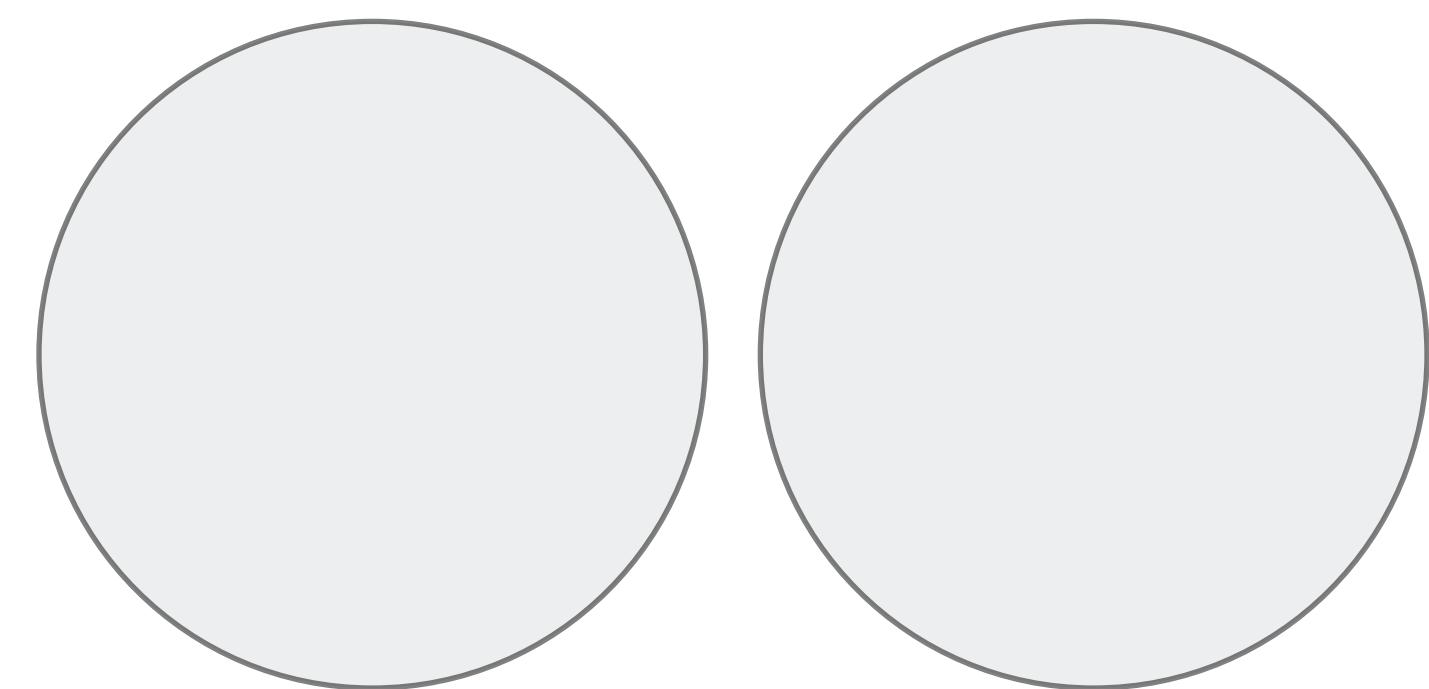
Expert



Novice-novice



Intermediate-intermediate



Expert-expert

# Let's Pair Up Right Now

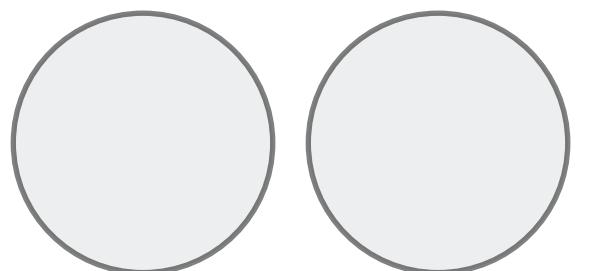
Discuss the following:

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

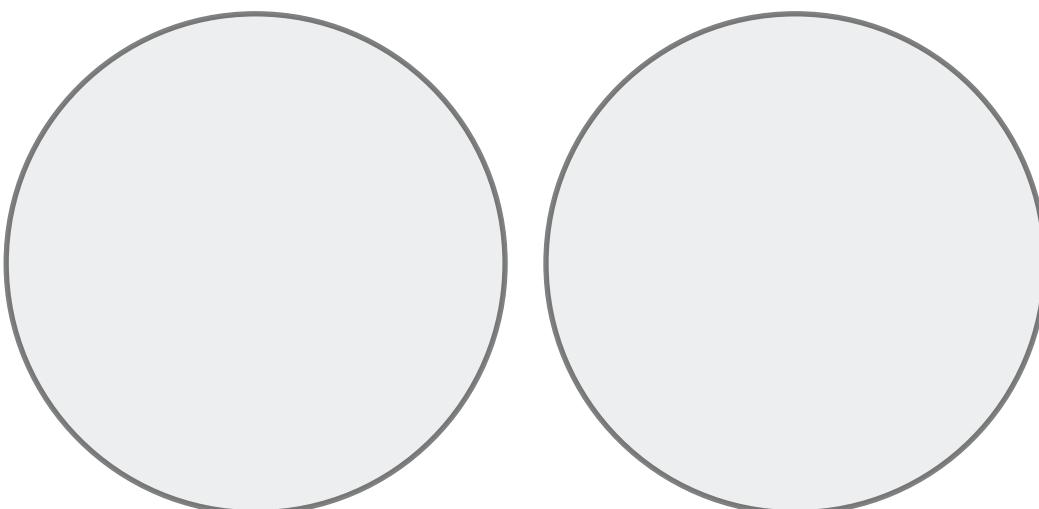
Why do you think that?



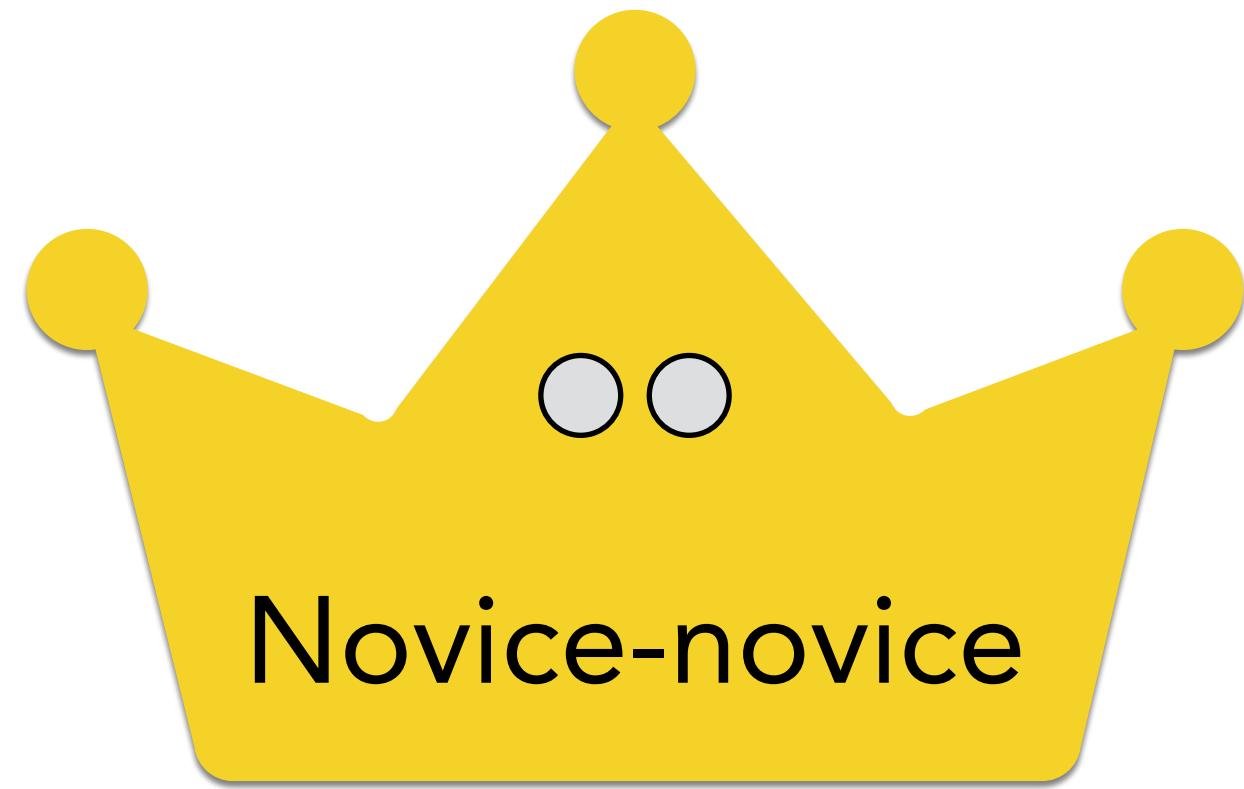
Novice-novice



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

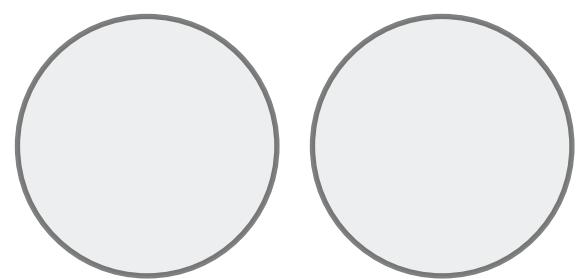
### Complex work



Novice-novice

+32%

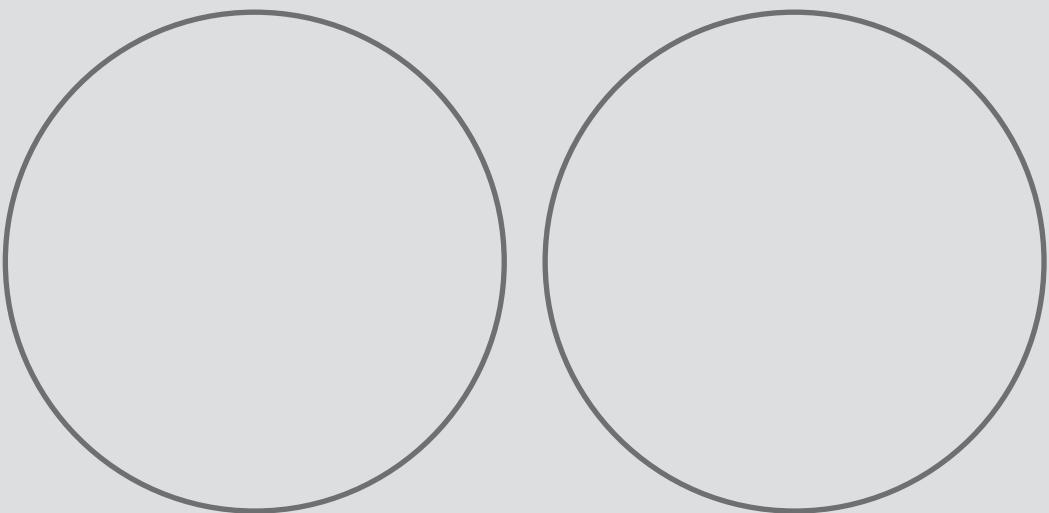
+149%



Intermediate-intermediate

-29%

+92%



Expert-expert

-13%

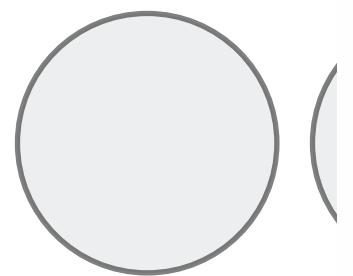
-2%

Increase in  
“correctness”

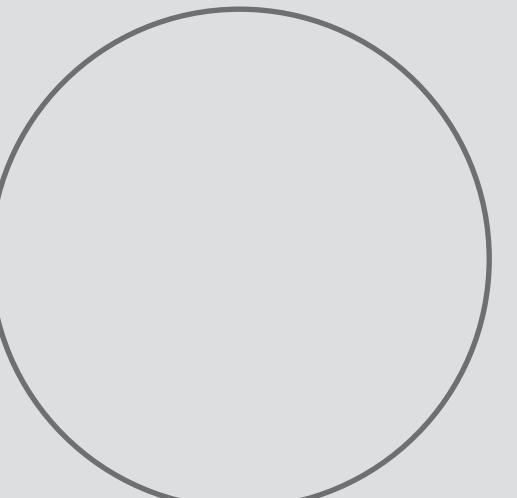


UberFacts ✅  
@UberFacts

Novice-r



Intermediate-i



Expert-e

○○

( )

i

?

?

e

lex work

| 49

92  
%

2%

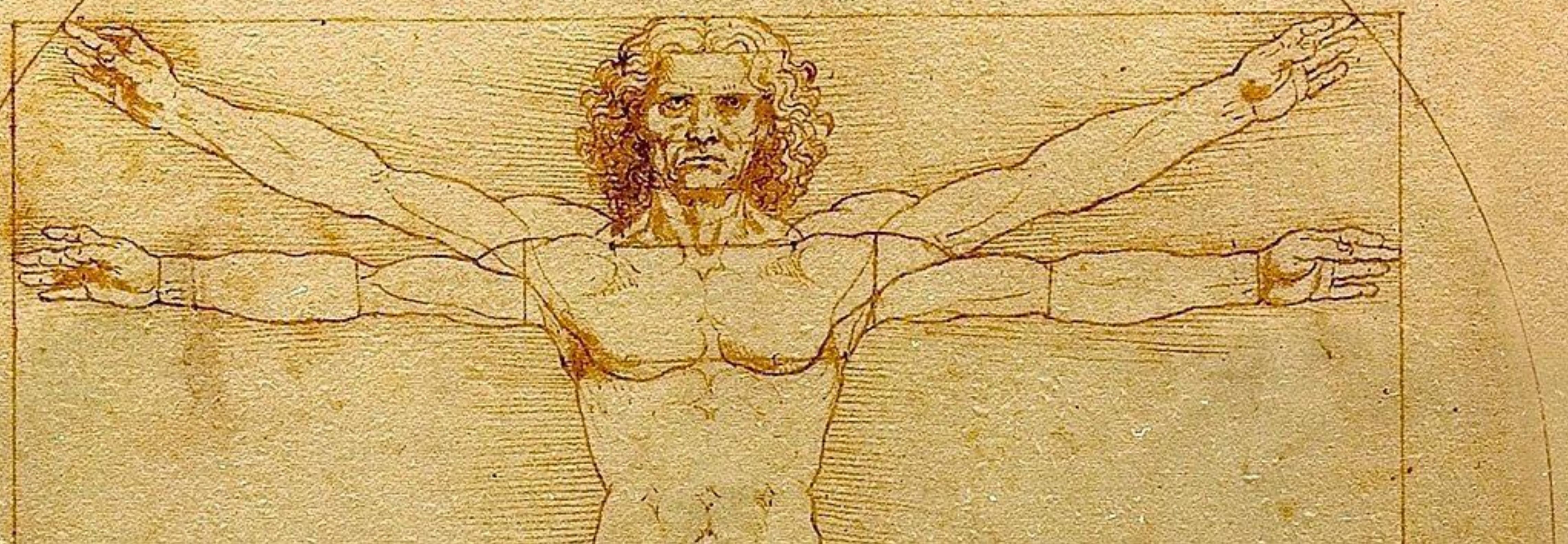
A study found that, when sober, rats prefer silence, but on cocaine, they prefer jazz.



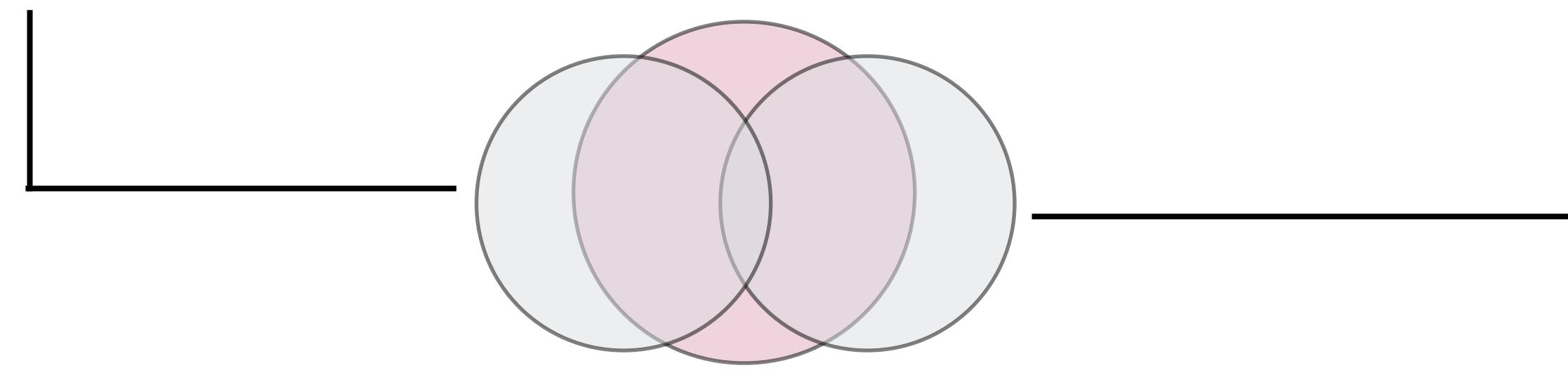
Alex ?  
 @\_vivid\_dreams

What do we do with this information

THERE IS NO SUCH THING  
AS AN AVERAGE PERSON

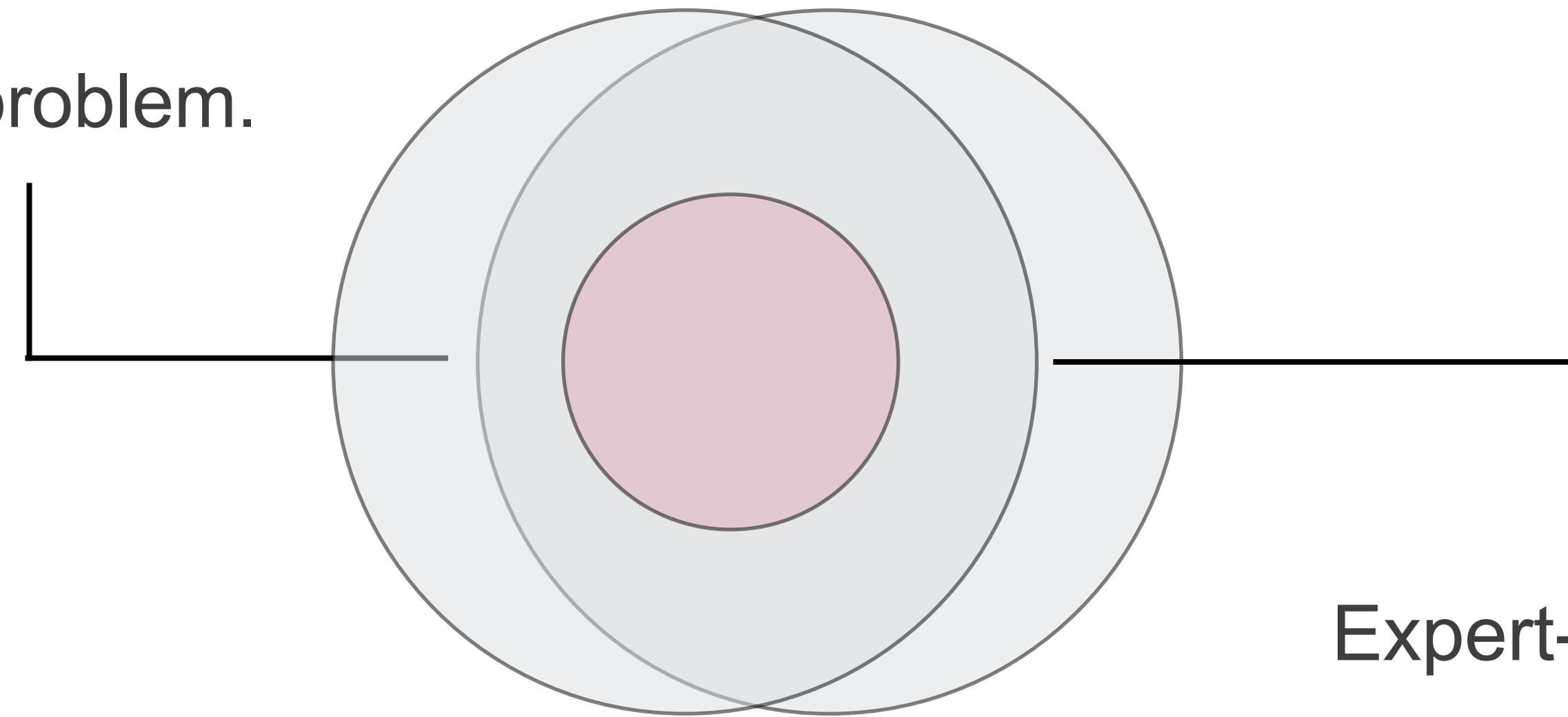


The difficulty of the problem.



Novice-novice pair

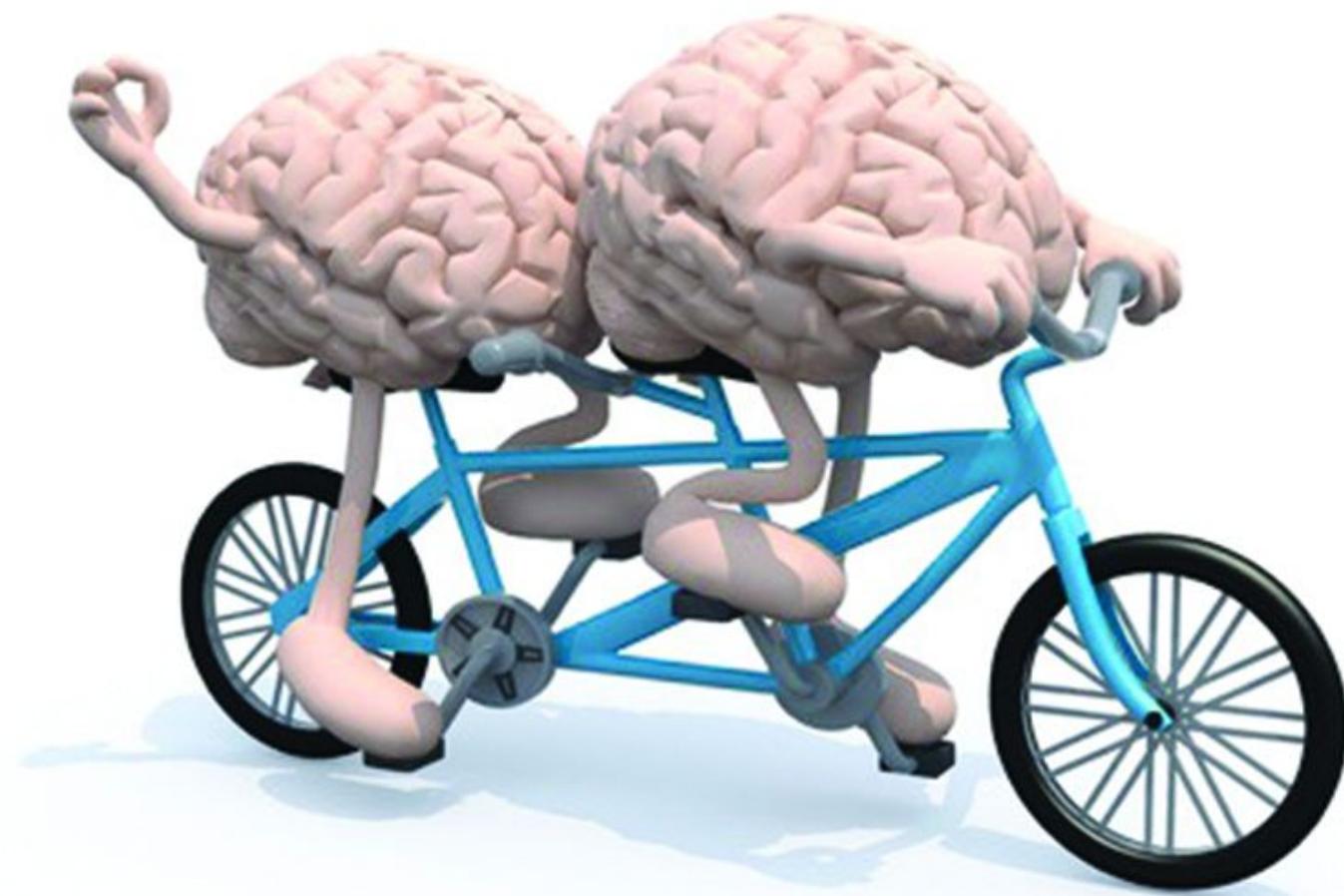
The difficulty of the problem.



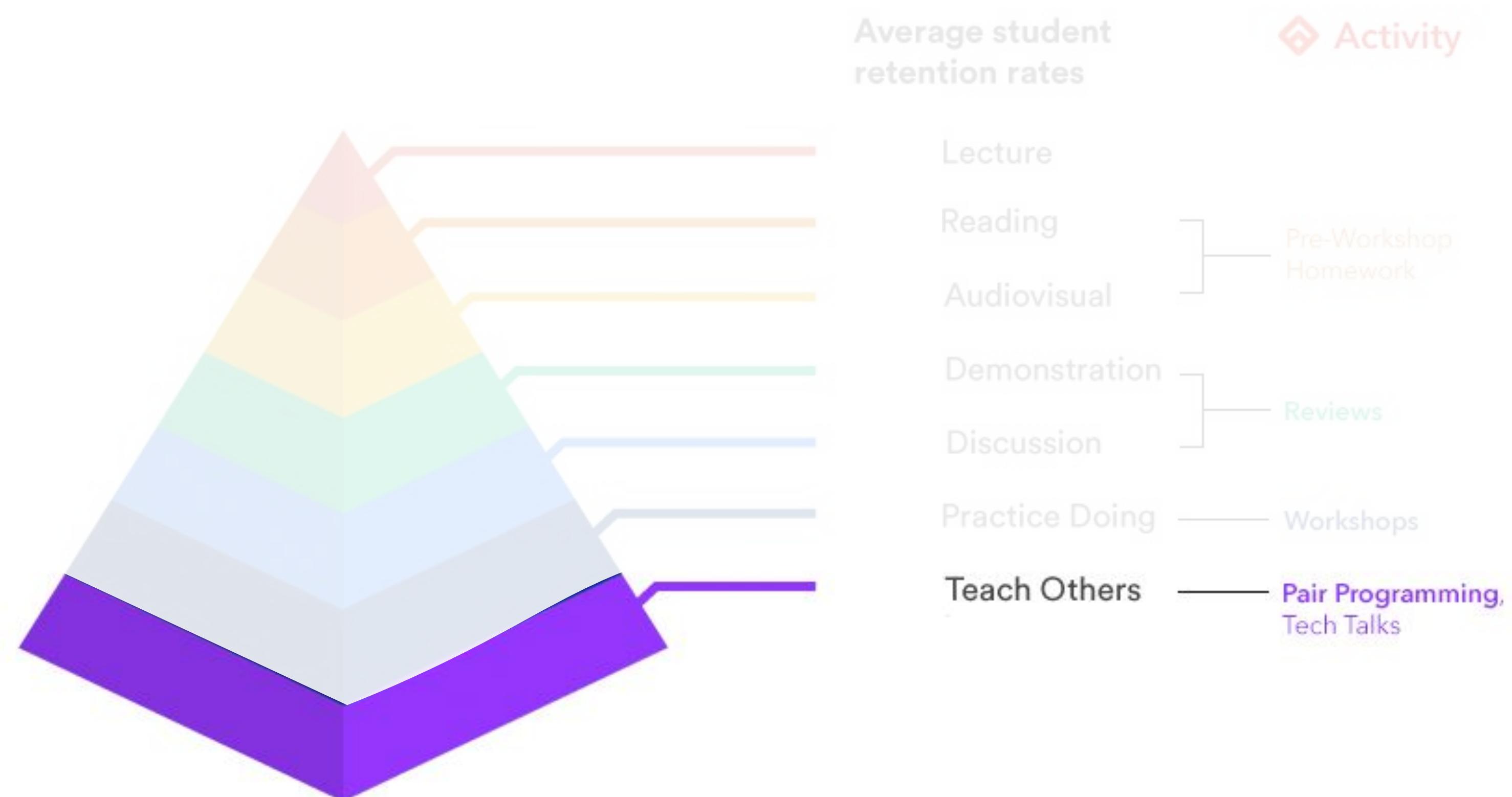
Expert-expert pair

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

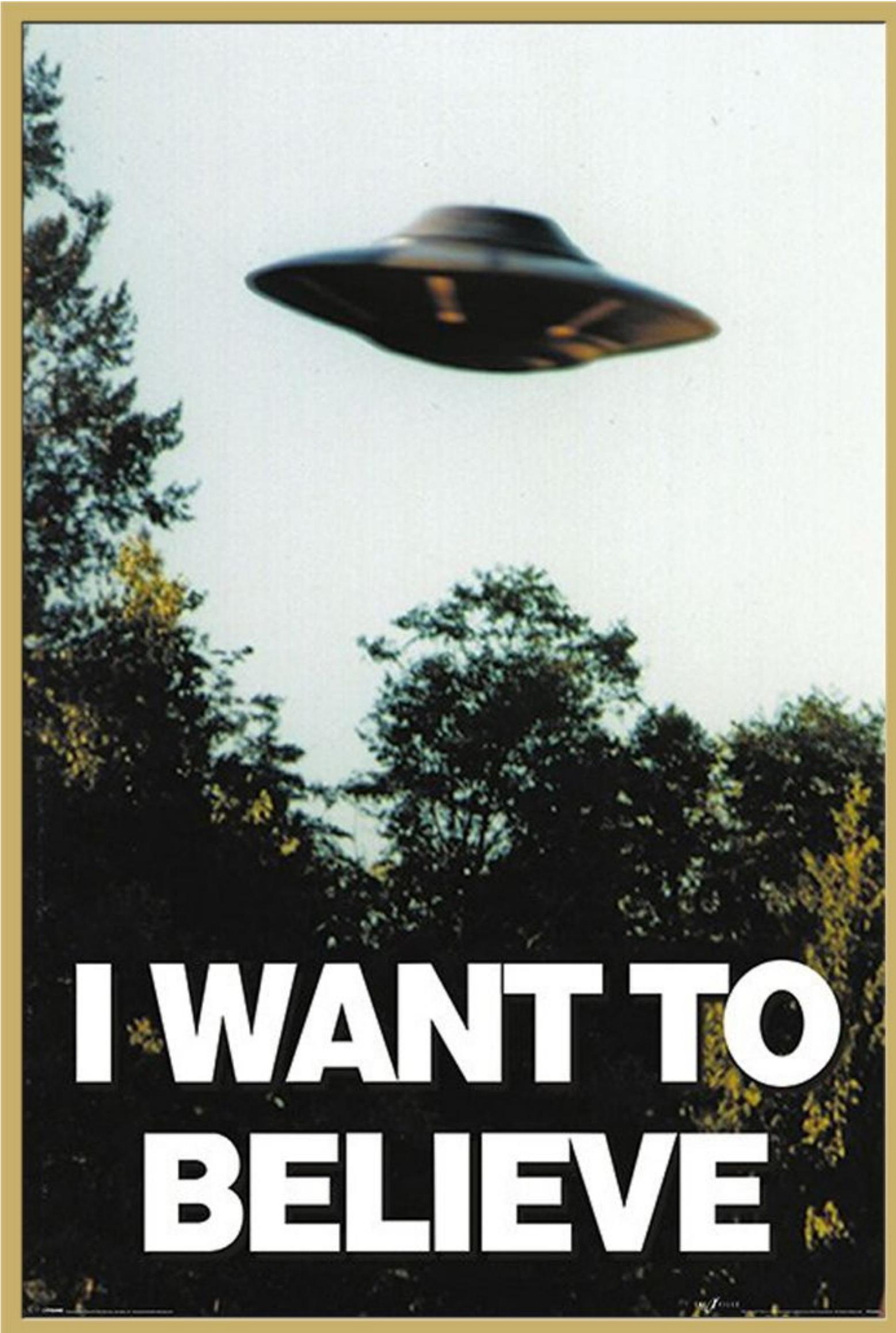
— Tess M. 1707



# Learning Pyramid @ Fullstack Academy



Source: National Training Laboratories, Bethel, Maine



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 short red hair, wearing a dark hoodie and jeans, sits on a tire swing. She is leaning forward, pushing off the ground with one foot. On the right, a man in a black jacket and dark pants sits on a long wooden seesaw, also leaning forward. The seesaw is tilted, with the woman's end higher than the man's. In the background, there is a grassy area with a brick wall and several other swings. A black rectangular overlay with the words "unbalanced pairs" in pink text is positioned in the upper right quadrant of the image.

unbalanced  
pairs

# Dance of the Little Swans



# Let's Pair Up Right Now

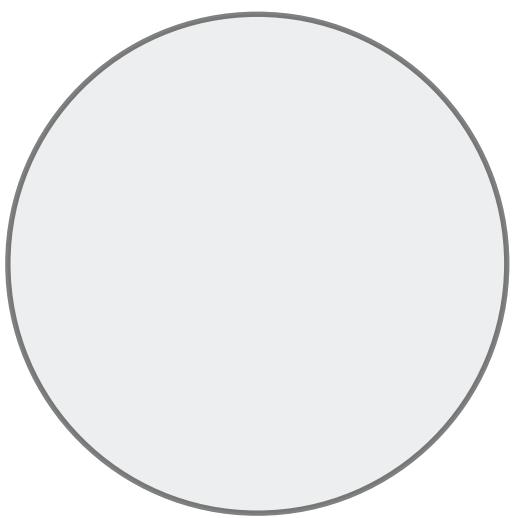
Discuss the following:

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

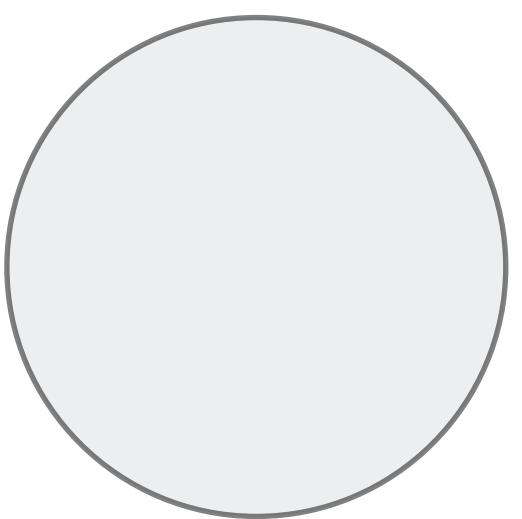
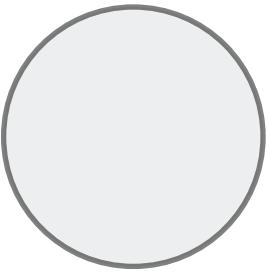
How is it different if the Driver or the Navigator is the stronger participant?

What can be done to mitigate these issues?

Driver



Navigator





## DETIMENTAL NAVIGATOR



☠️ Grabs the keyboard

☠️ Dictates code

☠️ Checks out





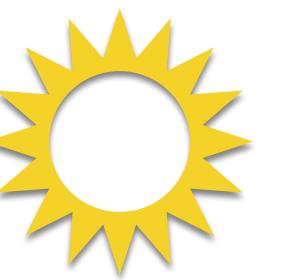
## DETРИMENTAL DRIVER



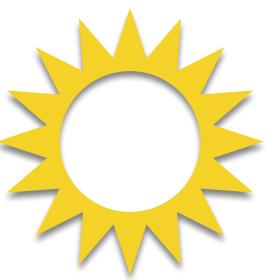
Skull emoji **Speeds ahead**

Skull emoji **Ignores navigator**

Skull emoji **Won't revisit code**

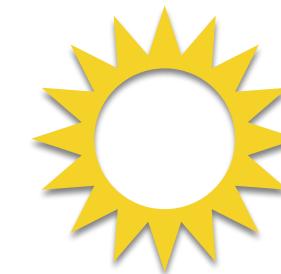


EXCELLENT  
NAVIGATOR

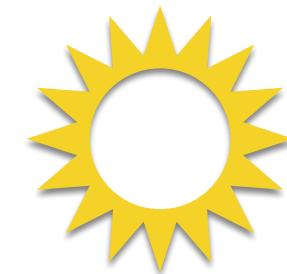


- Diagrams the approach
- Confirms understanding
- Stays engaged





## GREAT DRIVER



- Narrates their typing
- Confirms understanding
- Keeps steady pace



navigator

driver

# One set of hands on the keyboard



```
part default</> class Login extends Component {  
  render() {  
    return (  
      <div style={{ display: 'flex', align-items: 'center', justify-content: 'center' }}>  
        <div style={{ display: 'flex', align-items: 'center', justify-content: 'center' }}>  
          <h2 style={{ color: '#0070C0' }}>Image Header</h2>  
          <img alt="Logo" style={{ width: 100px, height: 100px }} alt="Placeholder for logo image" />  
        </div>  
        <div style={{ margin: '0 20px' }}>  
          <h3 style={{ color: '#0070C0' }}>Form Labels</h3>  
          <form style={{ display: 'flex', gap: '20px' }}>  
            <div style={{ display: 'flex', gap: '10px' }}>  
              <div style={{ flex: 1 }}>  
                <label style={{ color: '#0070C0' }}>Email</label>  
                <input type="text" name="email" placeholder="E-mail address" style={{ border: 1px solid #ccc, padding: 5px }} />  
              </div>  
              <div style={{ flex: 1 }}>  
                <label style={{ color: '#0070C0' }}>Password</label>  
                <input type="password" name="password" placeholder="Password" style={{ border: 1px solid #ccc, padding: 5px }} />  
              </div>  
            </div>  
            <div style={{ flex: 1 }}>  
              <button style={{ background: '#0070C0', color: 'white', border: 1px solid #0070C0, padding: 10px, width: '100%' }} type="submit">Submit</button>  
            </div>  
          </form>  
        </div>  
      </div>  
    )  
  }  
}
```



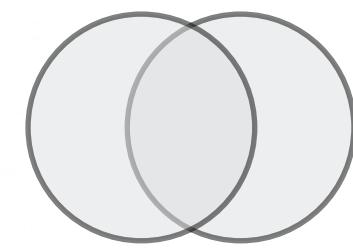
**Bring a brick,  
not a cathedral.**



A close-up photograph of a fluffy white cat with dark patches sleeping peacefully on a light-colored computer keyboard. The cat's head is resting near the top left of the keyboard, its body stretching across it. In the background, a computer monitor is visible, displaying a Windows desktop with icons like 'My Computer' and 'My Documents'.

# 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.

