



# The Engineering of Logic

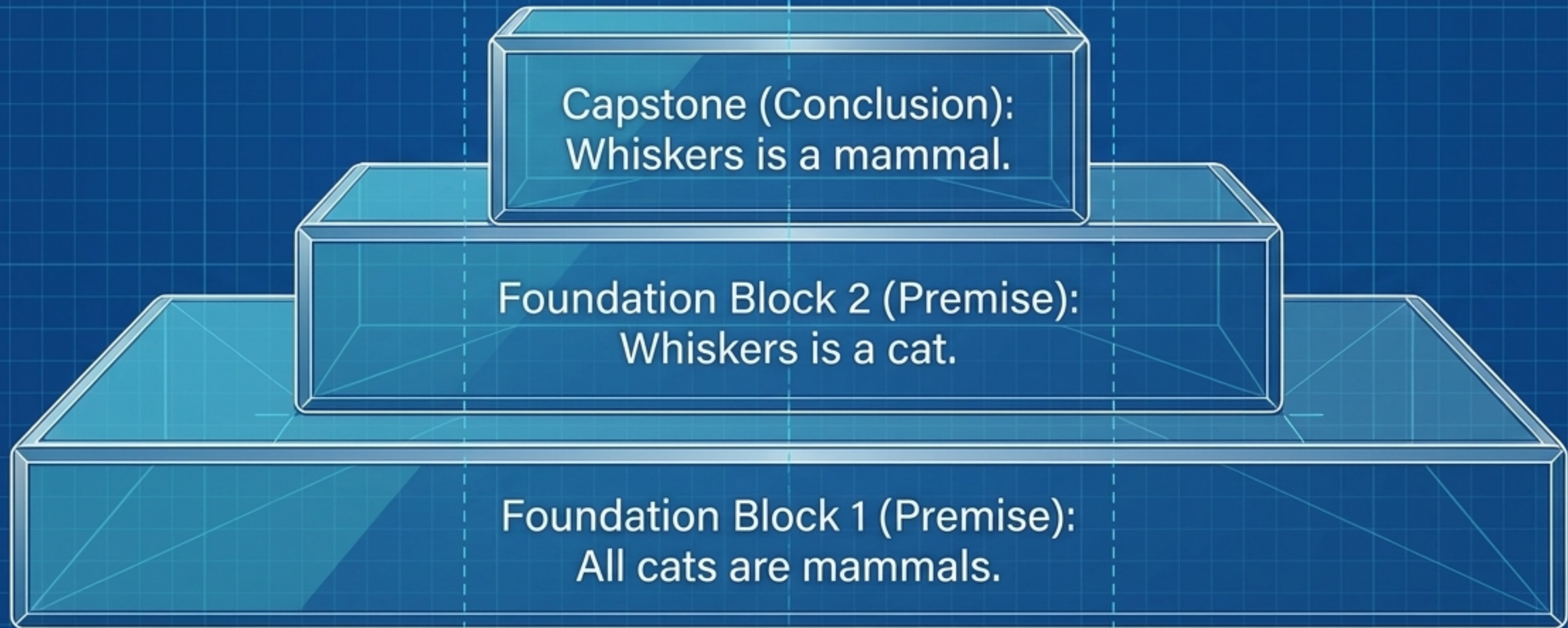
Reverse-engineering the mechanics of sound and unsound arguments.

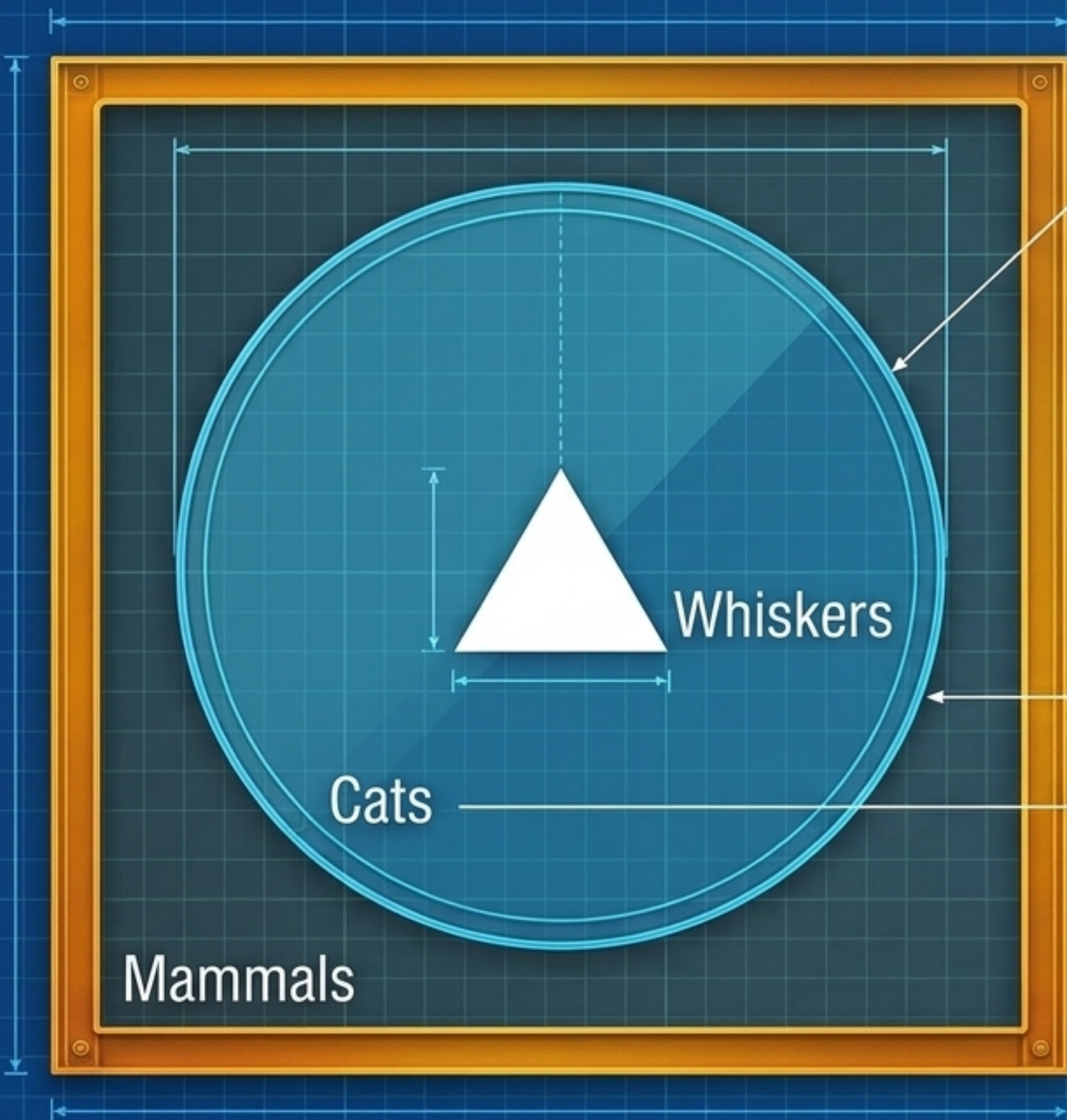
The blueprint of a perfectly engineered structure relies on two absolute requirements.



A sound argument guarantees a true conclusion.

# Building a sound structure from the ground up.





**The Interlocking Guarantee:**  
Valid reasoning means the architecture physically cannot fail.

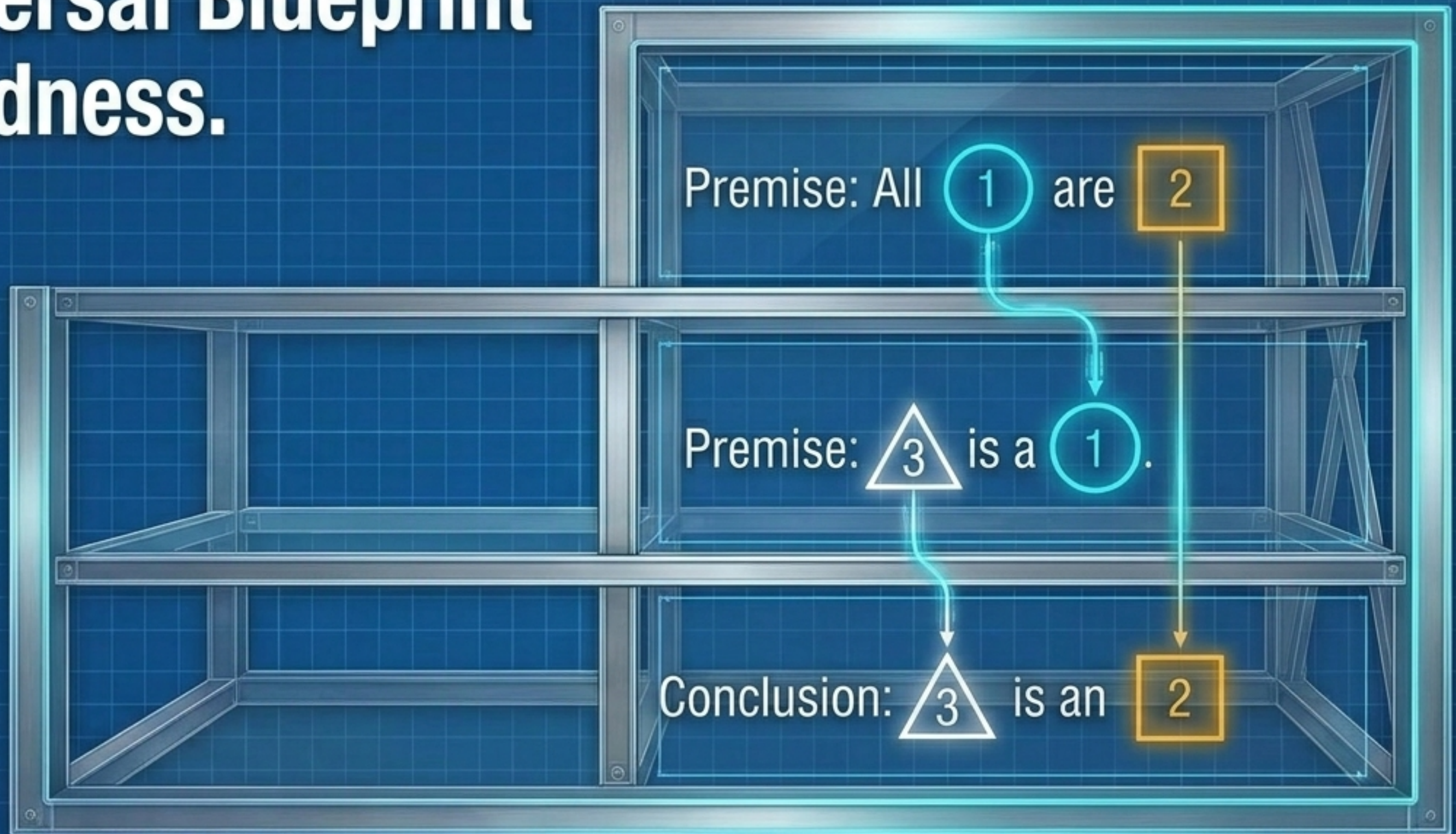
Because the components are perfectly nested, if the foundational premises are true, the conclusion is mathematically guaranteed to be true.

# Logic is governed by shape, not subject matter.



Cats = Cyan Circle ①  
Mammals = Amber Square ②  
Whiskers = White Triangle ③

# The Universal Blueprint for Soundness.

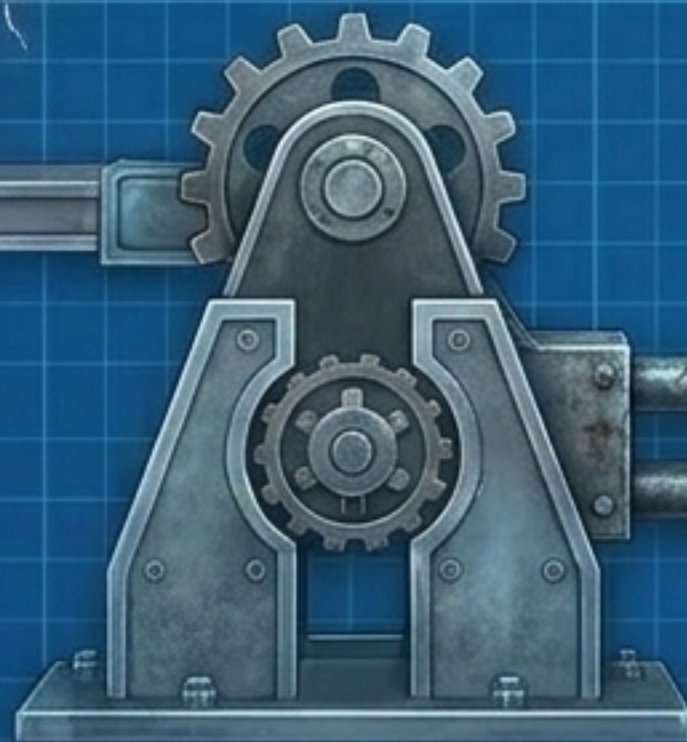


Every argument of this form is sound, regardless of what the variables stand for, as long as the premises are true.

# When the architecture fails.



**-OR-**



A single structural flaw compromises the entire edifice.

The deceptive structure:  
excellent materials,  
terrible engineering.

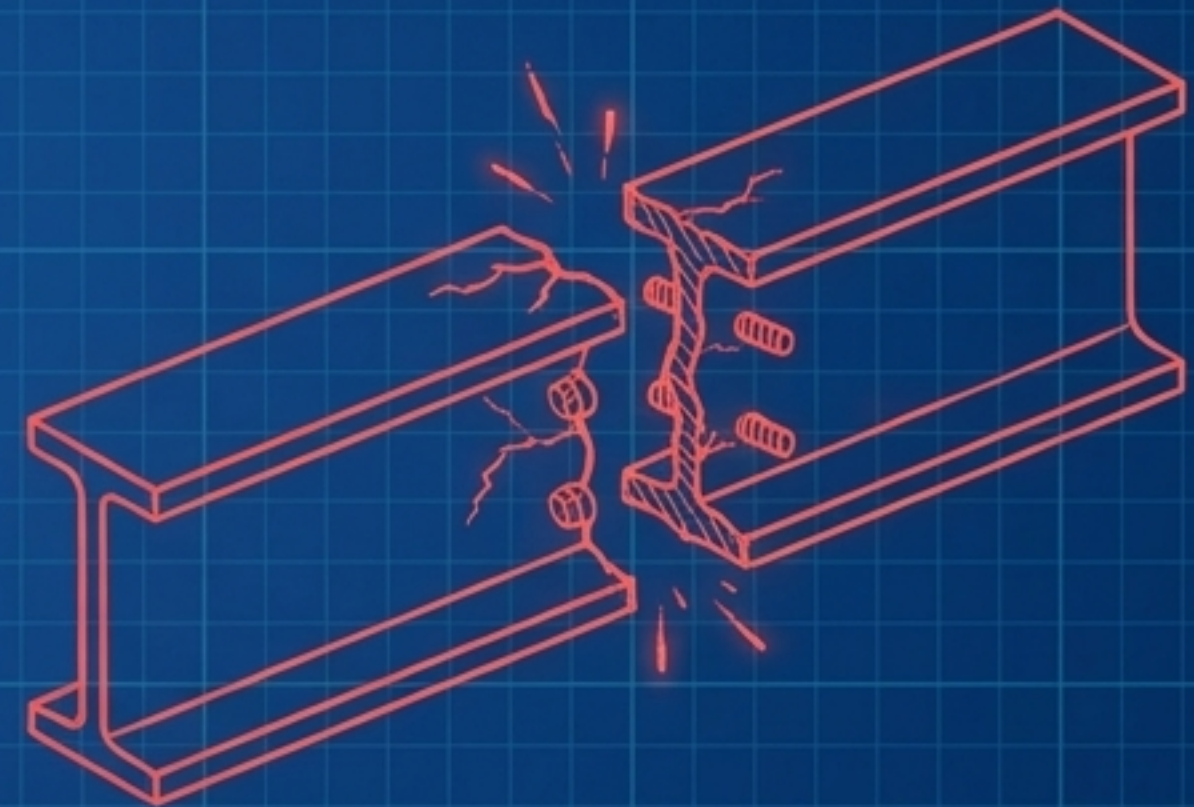


**Every statement in this argument is true.  
But the argument itself is unsound.**

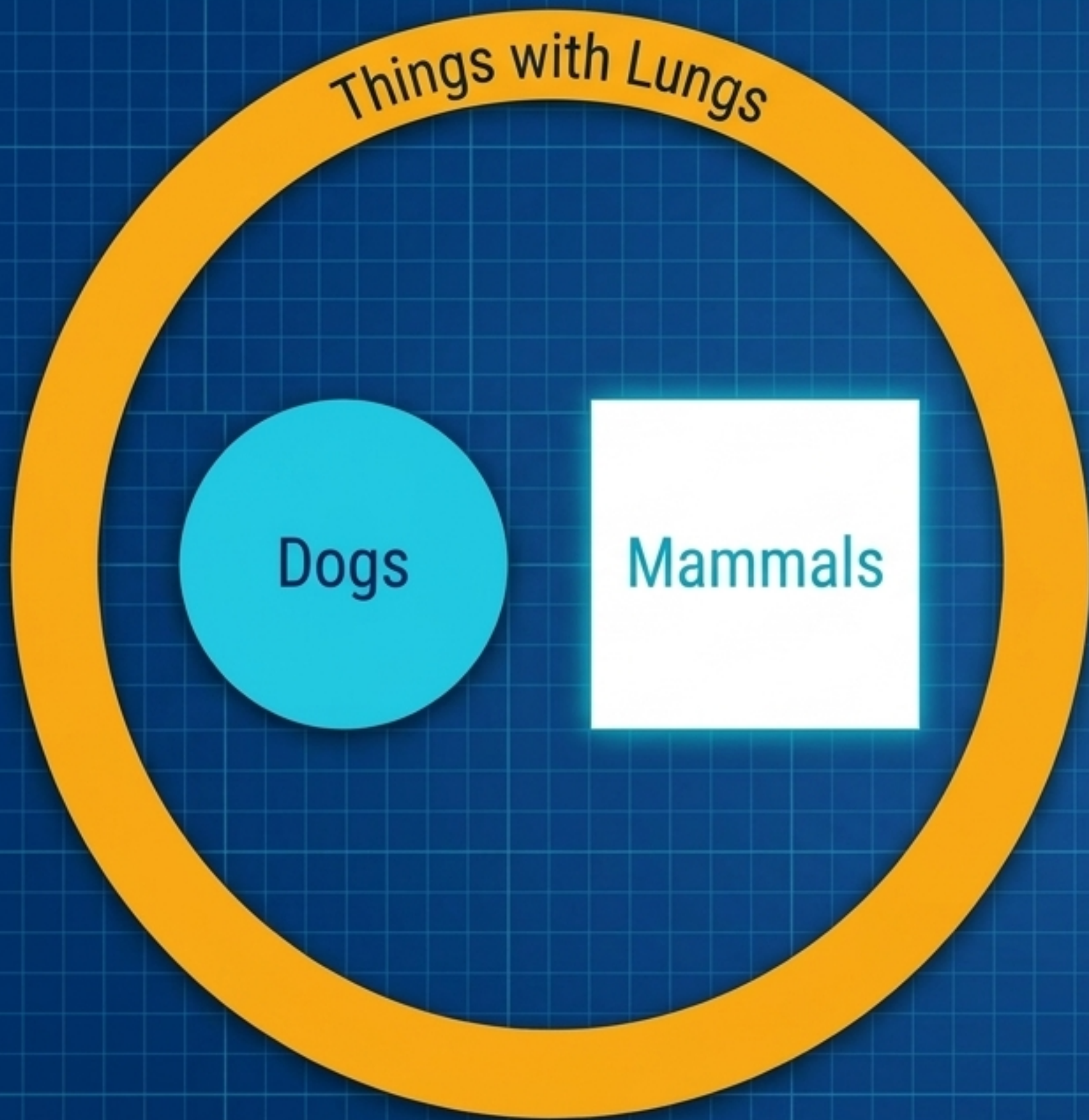
### **The Materials (Premises)**

- ✓ Mammals have lungs: True.
- ✓ Dogs have lungs: True.
- ✓ Dogs are mammals: True.

### **The Engineering (Reasoning)**



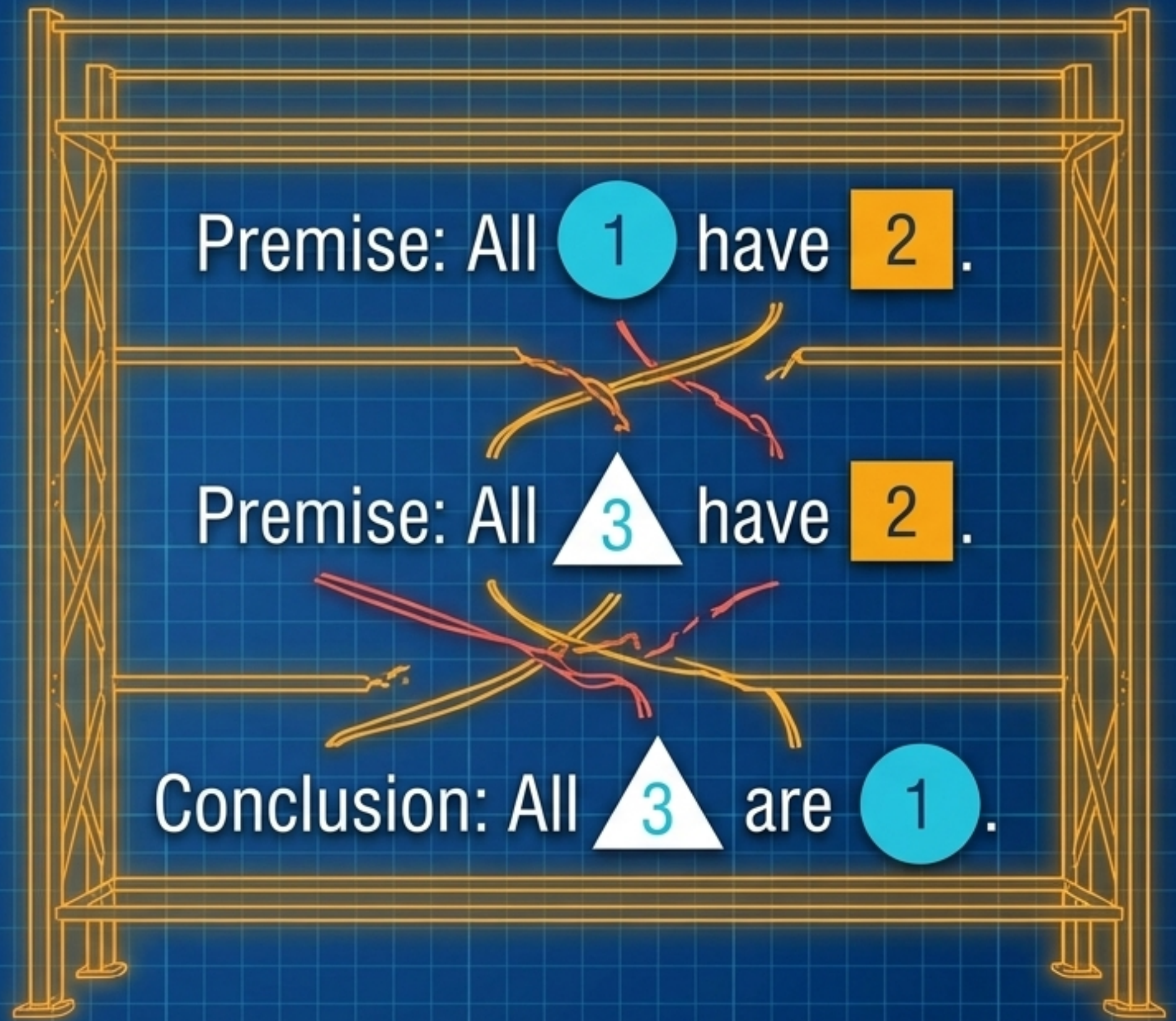
The materials (Premises) are flawless,  
but the reasoning is strictly invalid.



## The Disconnected Overlay: Visualizing the hidden flaw.

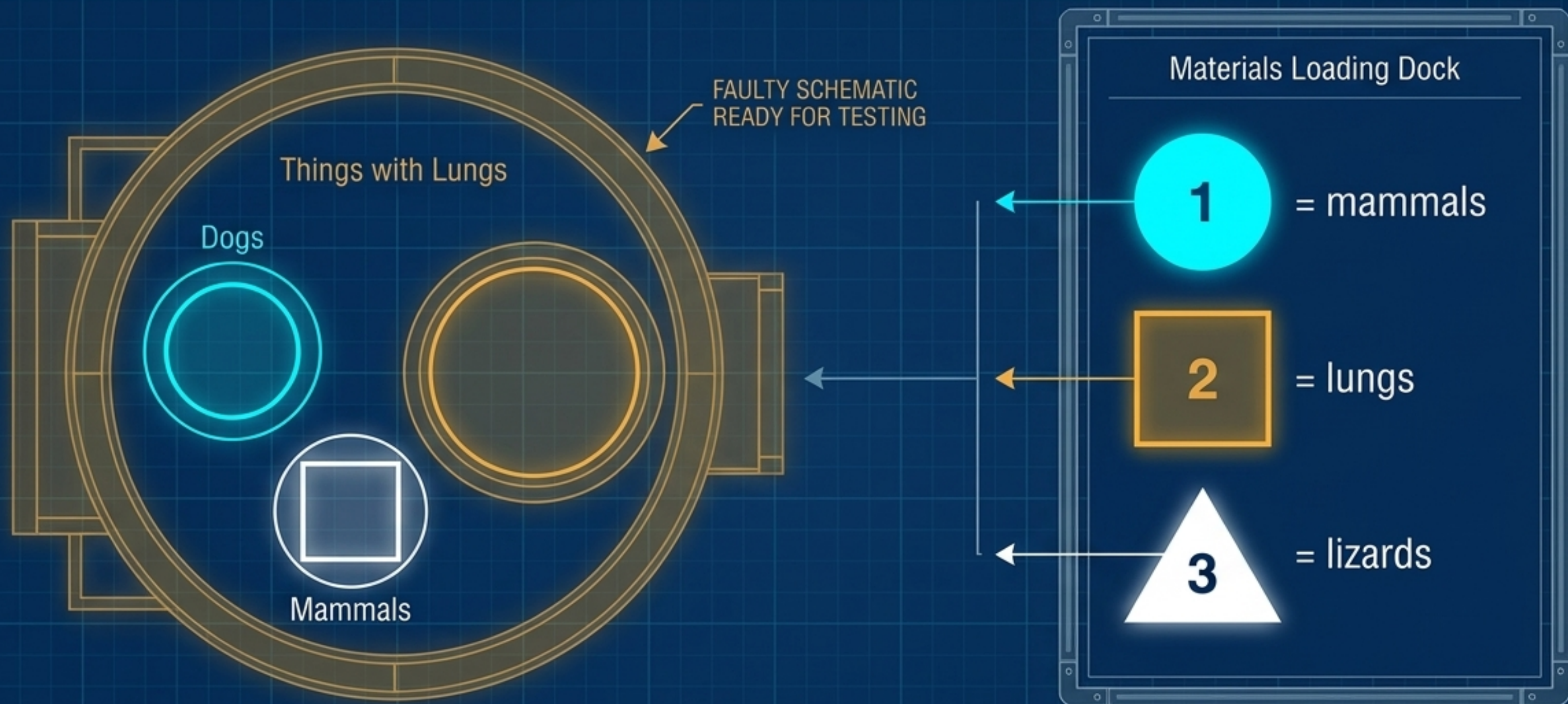
Sharing the same container (“Things with Lungs”) does not guarantee that the items overlap with each other. The structure physically permits “Dogs” to exist entirely outside of “Mammals.”

# Isolating the faulty schematic.



**Every argument of this form is unsound, regardless of the variables.**

# The Stress Test: Exposing the flaw via counterexample



To prove the structure is invalid, we will substitute new variables into the exact same faulty blueprint.

# Loading true premises into the faulty machine.



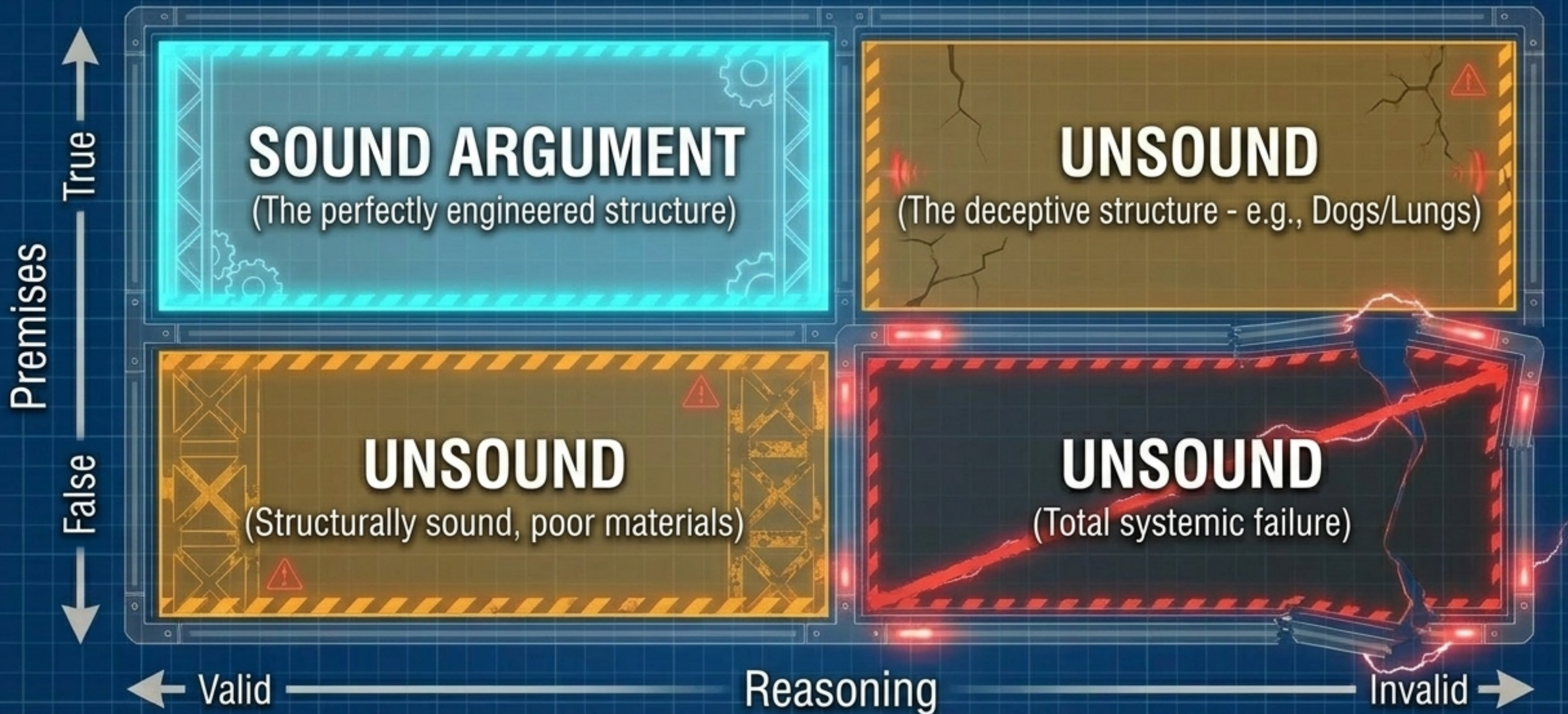
# Structural Collapse.

Conclusion Output:

Therefore all lizards  $\triangle 3$  are mammals  $\odot 1$ .

The premises are true, but the conclusion is undeniably false. A line of reasoning that leads from true statements to a false conclusion is strictly invalid.

# The Master Diagnostic Matrix



Logic requires both perfect materials and perfect architecture. Anything less is unsound.