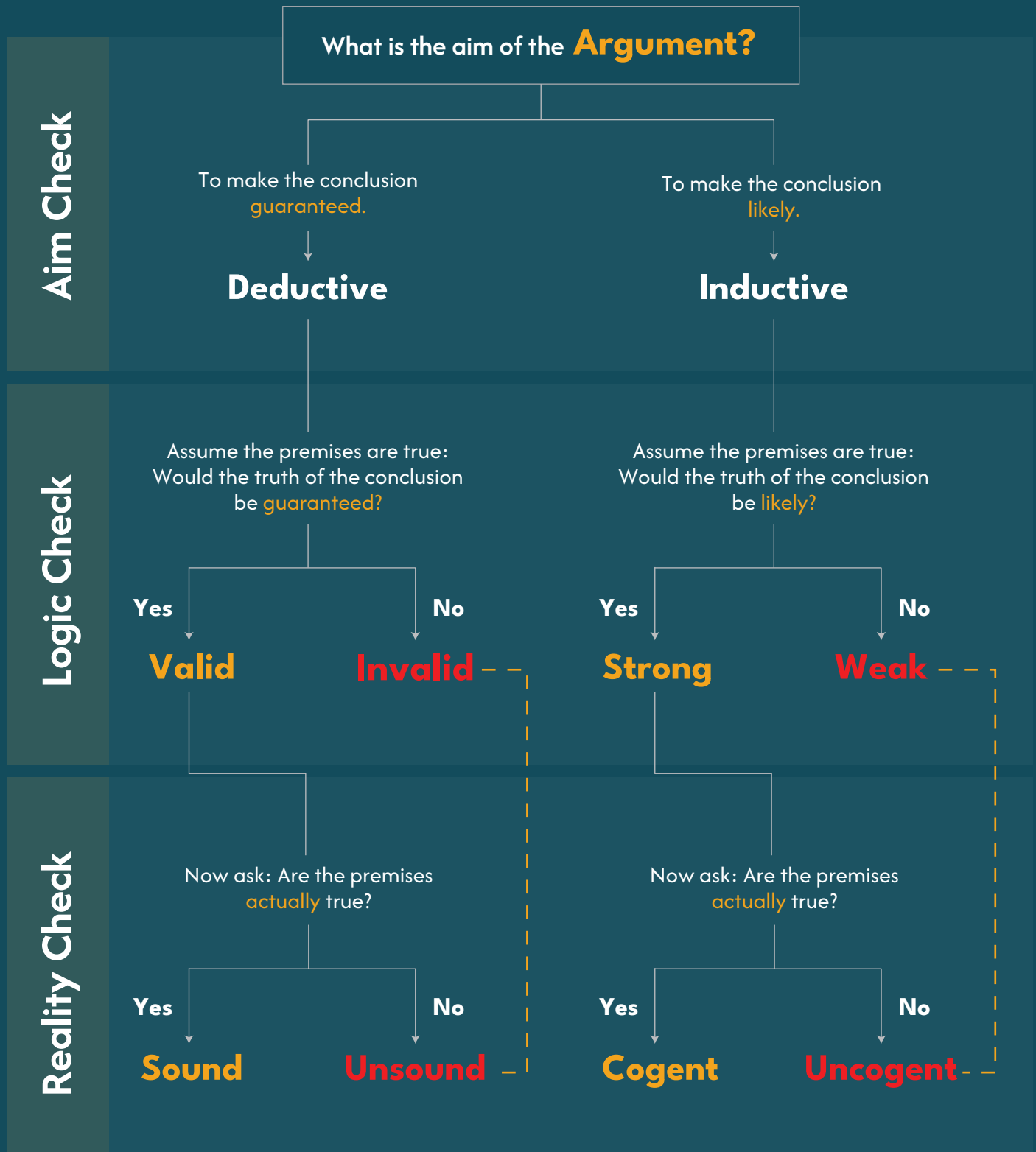


THE ARGUMENT MAP



----- Invalid arguments are unsound and weak arguments are uncogent.

Definitions

● Logic

The branch of philosophy that systematically studies the principles of correct reasoning.

- ◆ “Logic” is sometimes used to mean reasoning itself (e.g., “Your logic is mistaken”). More strictly, however, logic is the study of what makes reasoning correct or incorrect.

● Reasoning

The process of concluding one thing on the basis of something else.

- ◆ Reasoning is not just thinking in general. It involves drawing a conclusion from one or more reasons.

● Statement

A claim that can be either true or false.

- ◆ Not every sentence is a statement. Questions, commands, and exclamations are not statements because they are not true or false.

● Premise

A statement offered in support of a conclusion.

- ◆ A premise may or may not be true. And it may or may not actually support the conclusion. What matters is that it is put forward as supporting the conclusion.

● Conclusion

The statement for which the premises are offered in support

- ◆ A conclusion may or may not be true. And it may or may not actually be supported by the premises. What matters is that it is meant to be supported by the premises.

● Argument

A set of statements in which some (the premises) are offered in support of another (the conclusion).

- ◆ In logic, an argument is not a disagreement. It is an attempt to show that something is true by giving reasons for it.

Definitions

- **Deductive Argument**

An argument in which the premises, if true, are meant to guarantee the conclusion.

 - ◆ Deductive arguments aim for certainty. But a deductive argument may fail in its aim if the reasoning is flawed.
- **Valid Argument**

A deductive argument in which the premises, if true, guarantee the conclusion.

 - ◆ “Valid” is a term of approval for the reasoning of a deductive argument. It means the conclusion logically follows from the premises. It does not mean the premises—or the conclusion—are actually true.
- **Sound Argument**

A deductive argument that is valid and has true premises.

 - ◆ Validity requires only correct reasoning. Soundness requires correct reasoning and true premises.
- **Inductive Argument**

An argument in which the premises, if true, are meant to make the conclusion likely.

 - ◆ Inductive arguments aim for probability. But an inductive argument may fail in its aim if the reasoning is flawed.
- **Strong Argument**

An inductive argument in which the premises, if true, make the conclusion likely.

 - ◆ “Strong” is a term of approval for the reasoning of an inductive argument. It means the premises, if true, make the conclusion likely. It does not mean the premises are true or that the conclusion is in fact likely.
- **Cogent Argument**

An inductive argument that is strong and has true premises.

 - ◆ Strength requires only correct reasoning. Cogency requires correct reasoning and true premises

Key Points

It is possible for a valid argument to have a false premise.

Premise 1

All mammals can fly.
(False)

Premise 2

Bats are mammals.
(True)

Conclusion

Therefore, bats can fly.
(True)

Explanation: Premise 1 is false. But if the premises were true, the conclusion would have to be true. So the argument is valid, even though it has a false premise. In this case, the conclusion happens to be true—but only by coincidence.

It is possible for a valid argument to have a false conclusion.

Premise 1

All mammals can fly.
(False)

Premise 2

Whales are mammals.
(True)

Conclusion

Therefore, whales can fly.
(False)

Explanation: Premise 1 is false, and the conclusion is false. But if the premises were true, the conclusion would have to be true. So the argument is valid, even though the conclusion is false.

Lesson: In the real world, it's not enough for an argument to be valid.

It is impossible for a sound argument to have a false conclusion.

Premise 1

All mammals are animals.
(True)

Premise 2

Whales are mammals.
(True)

Conclusion

Therefore, whales are animals. (True)

Explanation: All the premises are true, and the reasoning is valid (if the premises are true, the conclusion must be true). So the argument is sound. Because sound arguments are valid and have true premises, they cannot have false premises or a false conclusion.

Lesson: A sound argument is the gold standard of reasoning.

Key Points

It is possible for a strong argument to have a false premise.

Premise 1

Most people who drink coffee every morning are extremely productive. (False)

Premise 2

Maria drinks coffee every morning. (True)

Conclusion

Therefore, Maria is extremely productive. (False)

Explanation: Premise 1 is false. But if the premises were true, they would make the conclusion likely. So the argument is strong, even though it has a false premise. This same example also shows that a strong argument can have a false conclusion.

It is possible for a cogent argument to have a false conclusion.

Premise 1

Most people who drink coffee late at night have trouble sleeping. (True)

Premise 2

Maria drank coffee late at night. (True)

Conclusion

Therefore, Maria will have trouble sleeping. (False)

Explanation: The premises are true and make the conclusion likely, so the argument is cogent. But inductive arguments do not guarantee their conclusions. Maria may be one of the rare exceptions who has no trouble falling asleep, even after drinking coffee.

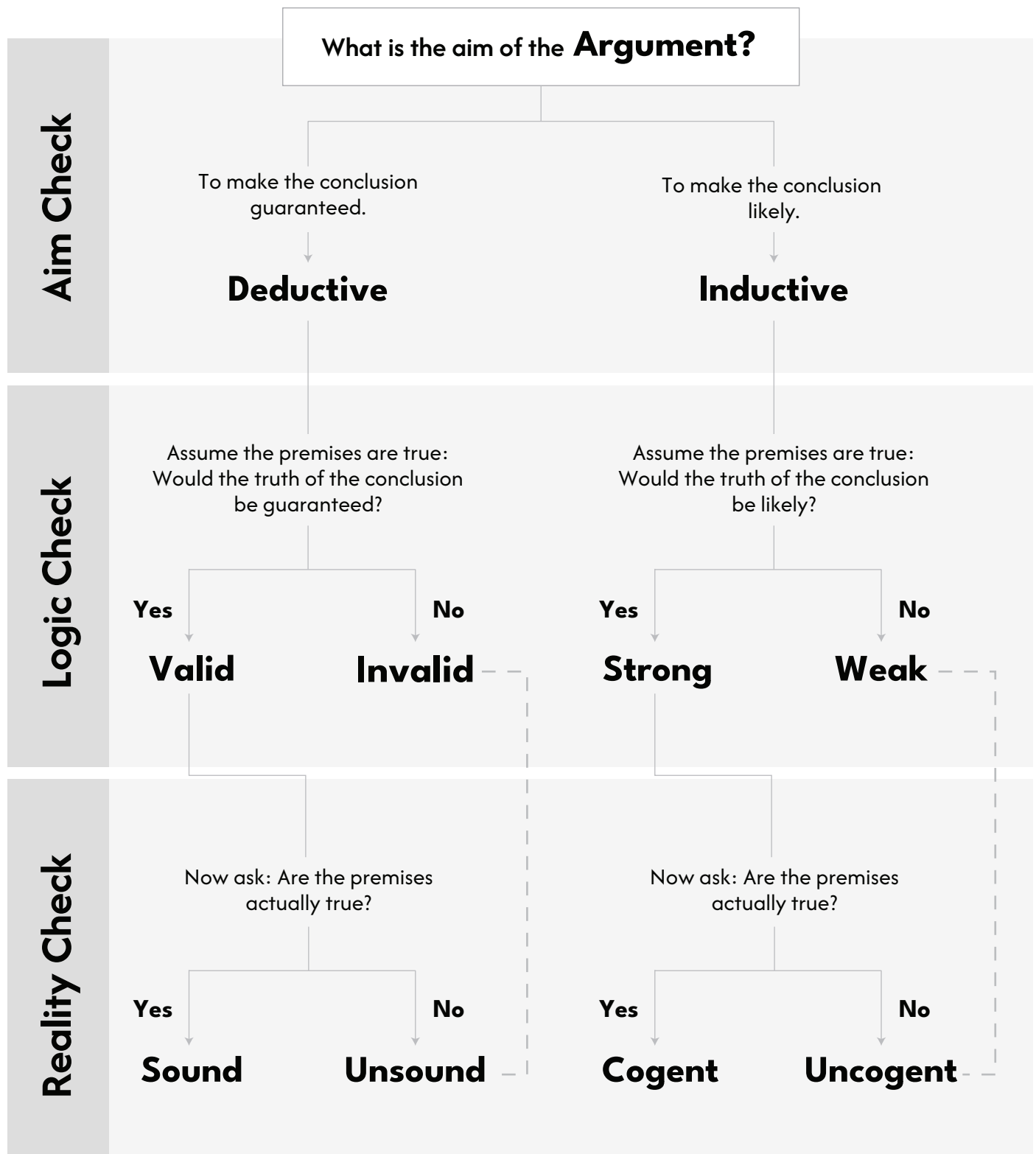
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Key Distinctions

- ◆ Deductive arguments aim for **certainty**; inductive arguments aim for **probability**.
- ◆ Validity and strength concern **reasoning**.
- ◆ Soundness and cogency concern **reasoning plus truth**.

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