

An argument with all true premises and a true conclusion, might or might not be deductively valid.

Example 1: deductively valid

All tigers are felines.

All felines are mammals.

Therefore all tigers are mammals.

Example 2: deductively invalid

If I'm over 4' tall, then I'm over 3' tall.

I'm over 3' tall.

So all I'm over 4' tall .

An argument with at least one false premise and a true conclusion might or might not be deductively valid.

Example 3: deductively valid

If I'm over 3' tall, I'm over 4' tall.

I'm over 3' tall.

Therefore I'm over 4' tall.

Example 4: deductively invalid

If I'm over 4' tall then I'm over 8' tall.

I'm over 8' tall. So I'm over 4' tall.

Example 5: deductively invalid

All mammals are animals.

All animals are tigers.

So all tigers are mammals.

An argument with at least one false premise and a false conclusion might or might not be deductively valid

Example 6: deductively valid

All dogs are animals with wings.

All animals with wings can fly.

So all dogs can fly.

Example 7: deductively valid

If I am over 9' tall, I'm over 8' tall.

I'm over 9' tall. So I'm over 8' tall.

Example 8: deductively invalid

If I am over 9' tall, I'm over 8' tall.

I'm over 8' tall. So I'm over 9' tall.

Example 9: deductively invalid

All tigers are animals.

All animals are snakes.

So all snakes are tigers.

BUT NO ARGUMENT WITH ALL TRUE PREMISES AND A FALSE CONCLUSION IS DEDUCIVELY VALID.

Categorical statement: assertion that some, all, or no members of a certain kind (category) of thing have a certain characteristic

The structure of Example 1:

All A are B.

All B are C.

Therefore all A are C.

The structure of Example 2 (and 4 and 8):

If A then B. B. Therefore A.

(fallacy: affirming the consequent)

Conditional statement: If ___ then ...

Antecedent: the 'if' part of a conditional.

Consequent: the 'then' part of a conditional

The structure of Example 3 (and 7):

If A then B.

Therefore .

(**Modus ponens**)

Modus ponens is truth-preserving.

If you apply this pattern to T premises, the conclusion you thereby infer will be T.

Any argument with this structure is valid just because of its structure.

Affirming the consequent is not truth-preserving.

The structure does NOT GUARANTEE that the conclusion you get by applying this pattern to T premises must be T.

The structure of Example 5:

All A are B.

All .

Therefore all

Unlike the structure of example 1, this is an invalid categorical structure, because it is not a truth-preserving structure.

NEXT PAGE FOR INDUCTIVE STRENGTH AND WEAKNESS

A argument with true premises and a true conclusion might or might not be inductively strong.

Example 10: inductively strong

Almost all college professors are over 30. I am a college professor.

So I am (probably) over 30.

Example 11: inductively weak

Flipper lives in water.

Flipper is a dolphin.

Dolphins are mammals.

So all mammals live in water.

An argument with at least one false premise and a true conclusion might or might not be inductively strong.

Example 12: inductively strong

The vast majority of women living in the US are college professors. I am a woman living in the US. So I'm a college professor.

Example 13: inductively weak

I have never taught a philosophy class. So most CSUN faculty have never taught a philosophy class.

An argument with at least one false premise and a false conclusion might or might not be inductively strong.

Example 14: inductively strong

More than 95% of all CSUN students are less than one foot tall. So it is likely that most students in this class are less than one foot tall.

Example 15: inductively weak

I own 10 cars. So most people own 10 cars.

An argument with all true premises and a false conclusion might or might not be inductively strong.

Example 16: inductively strong

The vast majority of adult females raised in the US are over 5'3". I am an adult female raised in the US.

So I'm over 5'3".

Example 17: inductively weak

I am under 5'2". I am an adult female raised in the US. So most adult females raised in the US are under 5'2".

REMEMBER:

An argument with all true premises and a false conclusion **might or might not be** INDUCTIVELY STRONG

BUT

an argument with all true premises and a false conclusion **CANNOT BE** DEDUCTIVELY VALID.

Also, an argument with whose premises and conclusion have **any other combination** of truth values (including all true premises and a true conclusion) **might or might not be** DEDUCTIVELY VALID (and likewise for INDUCTIVELY STRONG).

An argument structure is a **VALID STRUCTURE** if, and only if, it is truth-preserving.