

# Introduction to Logical Reasoning

## *Validity and Truth*

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# Truth and Falsity

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Recall that an individual statement is either true or false. A statement is **true** if and only if what it asserts is actually the case. A statement is **false** if and only if what it asserts is *not* the case.

This means that truth and falsity are attributes of individual *statements*. However, it makes no (logical) sense to say that an argument is true or false. This is because an argument is a collection of statements, not an individual one.

# Validity and Invalidity

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Instead, now know that a deductive argument is either valid or invalid. An argument is **valid** if and only if the truth of its premises logically entails the truth of its conclusion. An argument is **invalid** if and only if it is logically possible for the premises to be true while the conclusion is false.

This means that validity and invalidity are attributes of *arguments*. However, it makes no (logical) sense to say that an individual statement is valid or invalid.

# Some Facts

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The following information is true:

City	Latitude
Evanston, USA	$42^{\circ}2'28''\text{N}$
Pittsburgh, USA	$40^{\circ}26'26''\text{N}$
Doha, Qatar	$25^{\circ}17'12''\text{N}$
Key West, USA	$24^{\circ}33'19''\text{N}$

# Problem 1

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Use these facts to create a valid argument with two false premises and a false conclusion.

# Problem 2

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Use these facts to create an invalid argument with two false premises and a true conclusion.

# Argument 3

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Use these facts to create an invalid argument with two true premises and a true conclusion.

# Next Class...

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We will do a workshop on constructing valid/invalid arguments with true/false statements.

We also have our logic soiree with some special treats courtesy of my wife.