

Introduction to Logic

GEN 410
(Erion)

claim - a statement (or proposition, or assertion), typically expressed with a declarative sentence; the kind of thing that can be either true or false

Ex) Lucy is a Labrador retriever.

Ex) It is snowing outside.

argument - a set of claims with a conclusion that is supposed to be supported by one or more premises

premise - a supporting claim in an argument; often signaled by premise-indicating terms like 'since,' 'because,' 'for,' etc.

conclusion - the supported claim in an argument; often signaled by conclusion-indicating terms like 'therefore,' 'so,' 'hence,' 'consequently,' 'accordingly,' 'this implies that,' etc.

Logic teaches us that some arguments are truly better than others, and that the very best arguments (called *sound* arguments) have two characteristics:

(1) their premises are *true*

(2) their premises *support* or *entail* their conclusions (i.e., the conclusions *follow from* the premises; in logical terms, the arguments are *valid*).

valid argument - an argument where, *if* the premises are true, the conclusion *must* be true as well; in a valid argument, the premises give the *greatest possible support* to the conclusion, but validity does *not* guarantee the *truth* of a conclusion (compare A and B below)

sound argument - an argument that is *both valid and has all true premises*; a sound argument thus *guarantees the truth of its conclusion*, meeting both logical criteria for a good argument

strong argument - an argument where, *if* the premises are true, the conclusion is (only) *likely* to be true as well; in a strong argument, the premises provide good, but not absolute, support for the conclusion

A	B	C
1. All biologists are natural scientists. 2. Wilson is a biologist.	1. All biologists are bestselling authors. 2. Jon is a biologist.	1. <i>Most</i> biologists are uninterested in Greek mythology. 2. Wilson is a biologist.
3. Therefore, Wilson is a natural scientist.	3. Therefore, Jon is a bestselling author.	3. Therefore, Wilson is uninterested in Greek mythology.
* has all true premises, and * the premises do support the conclusion	* has a false premise, although * the premises do support the conclusion	* may have all true premises, but * the premises do not (absolutely) support the conclusion
valid and sound	valid, but unsound	invalid, and thus unsound (though perhaps strong?)