

# DEDUCTIVE & INDUCTIVE REASONING

# Expectations

1. Take notes on inductive and deductive reasoning.
2. This is an information based presentation -- I simply want you to be able to apply this information to your analysis of an argument.
3. There is A LOT of information in this PDF. Please annotate the text to ensure that you are picking you on key details.
4. You will need to know this information by tomorrow/Tuesday!

# Deductive Reasoning

A *deductive argument* is an argument that is intended by the arguer to be (deductively) *valid*, that is, to provide a guarantee of the truth of the conclusion provided that the argument's premises (assumptions) are true. This point can be expressed also by saying that, in a deductive argument, the premises are intended to provide such strong support for the conclusion that, if the premises are true, then it would be impossible for the conclusion to be false. An argument in which the premises do succeed in guaranteeing the conclusion is called a (deductively) valid argument. If a valid argument has true premises, then the argument is said to be *sound*.

# Inductive Reasoning

An *inductive argument* is an argument that is intended by the arguer merely to establish or increase the probability of its conclusion. In an inductive argument, the premises are intended only to be so strong that, if they were true, then it would be *unlikely* that the conclusion is false. There is no standard term for a successful inductive argument. But its success or strength is a matter of degree, unlike with deductive arguments. A deductive argument is valid or else invalid.

# Deductive & Inductive Reasoning

The difference between the two kinds of arguments does not lie solely in the words used; it comes from the relationship the author or expositor of the argument takes there to be between the premises and the conclusion.

- **If the author of the argument believes that the truth of the premises *definitely establishes* the truth of the conclusion (due to definition, logical entailment, logical structure, or mathematical necessity), then the argument is *deductive*.**
- **If the author of the argument does not think that the truth of the premises definitely establishes the truth of the conclusion, but nonetheless believes that their truth provides good reason to believe the conclusion true, then the argument is *inductive*.**

# Deductive & Inductive Reasoning

Because **deductive arguments** are those in which **the truth of the conclusion is thought to be completely guaranteed** and not just made probable by the truth of the premises, if the argument is a sound one, then the truth of the conclusion is said to be "contained within" the truth of the premises; that is, the conclusion does not go beyond what the truth of the premises implicitly requires. For this reason, deductive arguments are usually limited to inferences that follow from definitions, mathematics and rules of formal logic. Here is a deductive argument:

***John is ill. If John is ill, then he won't be able to attend our meeting today. Therefore, John won't be able to attend our meeting today.***

That argument is valid due to its logical structure. If 'ill' were replaced with 'happy', the argument would still be valid because it would retain its special logical structure (called modus ponens).

# Deductive & Inductive Reasoning

Here is the form of any argument having the structure of modus ponens:

P

If P then Q

So, Q

The capital letters stand for declarative sentences, or statements, or propositions.

# Deductive & Inductive Reasoning

Inductive arguments can take very wide ranging forms. Inductive arguments might conclude with some claim about a group based only on information from a sample of that group. Other inductive arguments draw conclusions by appeal to evidence or authority or causal relationships.

Here is a somewhat strong inductive argument based on authority:

*The police said John committed the murder. So, John committed the murder.*

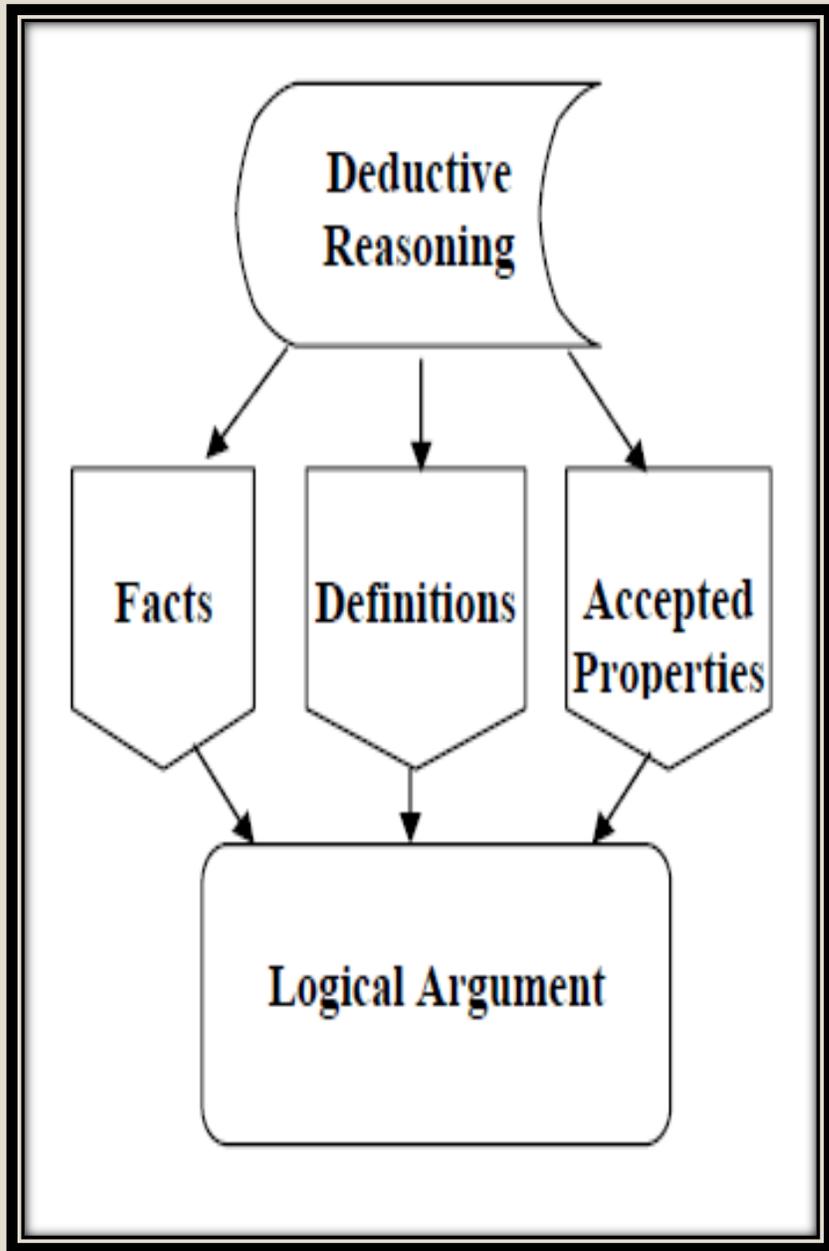
Here is an inductive argument based on evidence:

*The witness said John committed the murder. So, John committed the murder.*

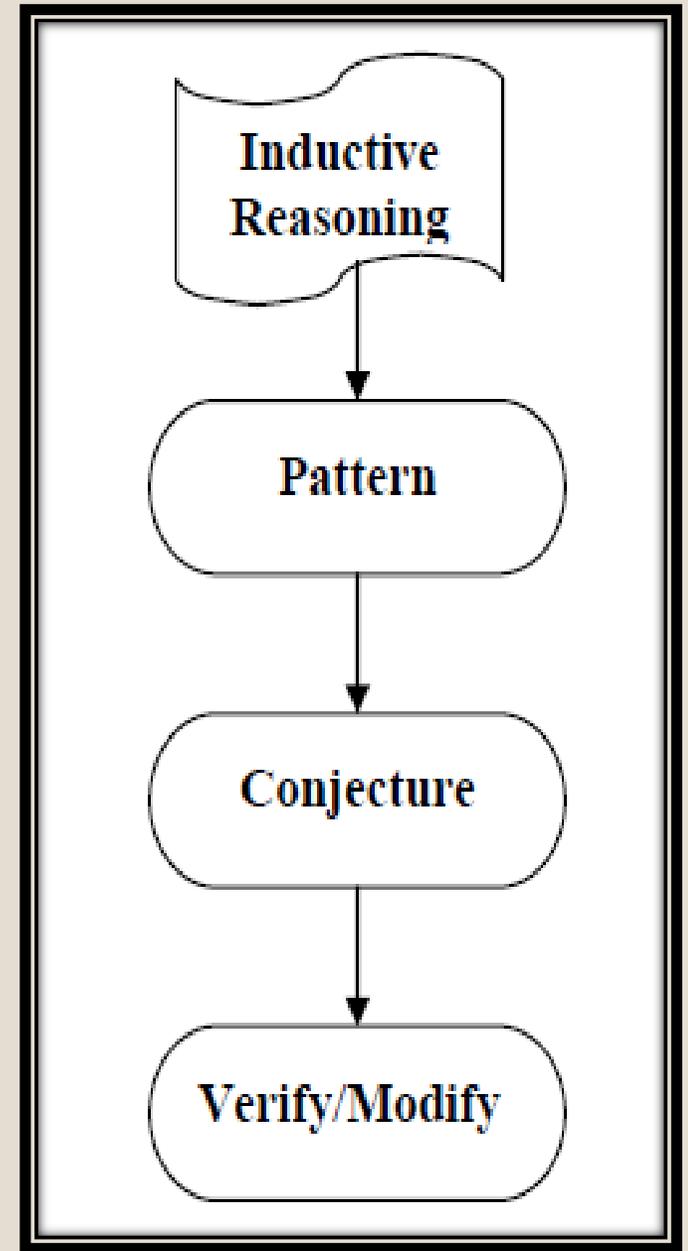
Here is a stronger inductive argument based on better evidence:

*Two independent witnesses claimed John committed the murder. John's fingerprints are the only ones on the murder weapon. John confessed to the crime. So, John committed the murder.*

This last argument is no doubt good enough for a jury to convict John, but none of these three arguments about John committing the murder is strong enough to be called valid. At least it is not valid in the technical sense of 'deductively valid'. However, some lawyers will tell their juries that these are valid arguments, so we critical thinkers need to be on the alert as to how people around us are using the term.



Deductive vs.  
Inductive  
Reasoning...  
A visual 😊





Click on the Prezi image and review information on deductive and inductive reasoning.