An Argument Abstractly in Rhetoric
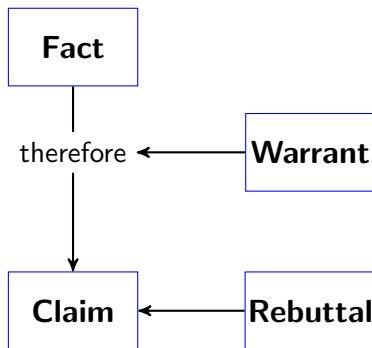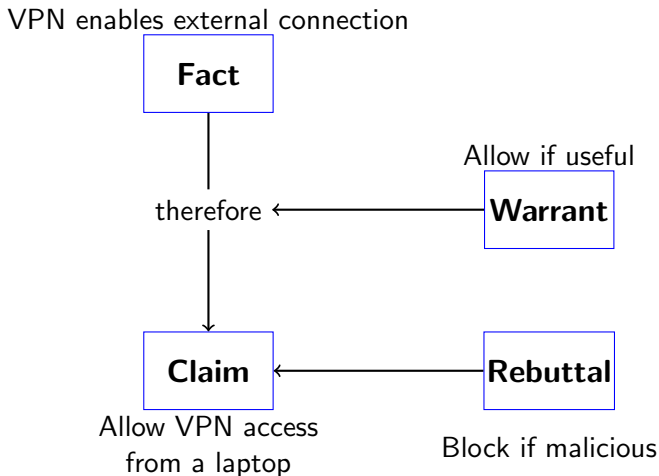
Due to Stephen Toulmin, 1958
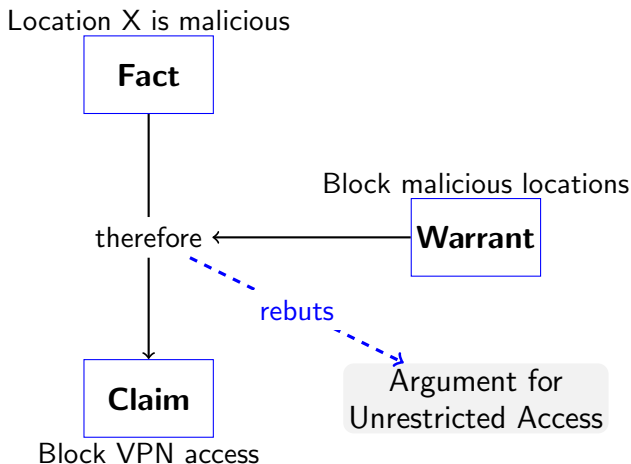
An Argument as Rationale
Call this the Argument for Unrestricted Access

VPN enables external connection

Fact

therefore ← **Warrant**

Allow if useful

Claim ← **Rebuttal**

Allow VPN access
from a laptop

Block if malicious

Arguments can Attack Other Arguments
Call this the Argument for Blocking Malicious Locations

Location X is malicious

Fact

Block malicious locations

therefore ← **Warrant**

rebuts

Claim

Argument for
Unrestricted Access

Block VPN access

Identify Revised Claim

One that resists the rebuttal

VPN enables external connection
Location X is malicious

Fact

Allow if requested
except from
malicious locations

therefore ← **Warrant**

Claim

Allow VPN access
except from X

Argumentation Schemes (and Critical Questions)
Walton

- ▶ Scheme: Pattern for constructing an argument
    - ▶ Represents the inferential structure of an argument
    - ▶ Can be applied recursively to different elements
    - ▶ Identifies when it is applicable
    - ▶ Brings up specific critical questions
- ▶ Critical question
    - ▶ Depend upon the argumentation scheme being applied
    - ▶ Summarizing an argument may involve identifying critical questions and how they are answered

Example Scheme: Argument from Cause to Effect

▶ Scheme
  ▶ Generally, if cause A occurs, then effect B will or might occur
  ▶ In this case, A occurs or might occur
  ▶ Therefore, in this case, B will or might occur

▶ Critical questions
  ▶ How strong and reliable is the causal generalization?
  ▶ Is any evidence cited to warrant the causal generalization?
  ▶ If so, is that evidence strong enough?
  ▶ Are there other factors that would interfere with or counteract the production of the effect?

Walton's Argumentation Schemes

Informal logic

Argument from Sign	Argument from an Exceptional Case
Argument from Analogy	Argument from Bias
Argument from Cause to Effect	Argument from Correlation to Causes
Argument from Established Rule	Argument from Evidence to a Hypothesis
Argument from Falsification of a Hypothesis	
Argument from Example	Argument from Commitment
Circumstantial Argument Against the Person	
Argument from Popular Practice	Argument from Popularity
Argument from Position to Know	Argument from Expert Opinion
Argument from Precedent	Argument from Consequences
Argument from Waste	Argument from Verbal Classification
Argument from Vagueness of a Verbal Classification	
Argument from Arbitrariness of a Verbal Classification	
Argument from Gradualism	Full Slippery Slope Argument
Causal Slippery Slope Argument	Precedent Slippery Slope Argument
Plausible Argument from Ignorance	Deductive Argument from Ignorance
Ethotic Argument (based on ethos)	

NLP Challenges

Analyzing and summarizing arguments in text or dialog

- ▶ Argument mining
    - ▶ How can we extract the structure of an argument?
    - ▶ How can we identify the argument schemes used in an argument?
- ▶ Authoring arguments
    - ▶ How can we help select an argumentation scheme from a partial argument?
    - ▶ How can we raise critical questions to guide the authoring?

Purposes of Arguments
Walton

- ▶ Persuasive
- ▶ Deliberative: decide on a course of action
- ▶ Inquiry: scientific or public inquiry
- ▶ Negotiation
- ▶ Information seeking: interview or soliciting advice
- ▶ Eristic (polemical): quarrel

The purposes can influence how they play out

Traditional formal approaches emphasize entire arguments, not how they are constructed interactively

Relationships Between Arguments

The terminology is not uniformly applied in the research community
Mostly doesn't follow Toulmin

- ▶ Support
  - ▶ Reinforce the claim (i.e., conclusion): parallel argument
  - ▶ Reinforce a premise
  - ▶ Reinforce the warrant
- ▶ Attack
  - ▶ Attack the conclusion: rebut
  - ▶ Attack a premise: undercut (sometimes undermine)

NLP for Arguments

- ▶ Considers attack and support relations
    - ▶ Current work, doesn't emphasize components of such relations
- ▶ Identify claims, premises, supports, attacks in text

(1) Museums and art galleries provide a better understanding about arts than Internet. (2) In most museums and art galleries, detailed descriptions in terms of the background, history and author are provided. (3) Seeing an artwork online is not the same as watching it with our own eyes, as (4) the picture online does not show the texture or three-dimensional structure of the art, which is important to study.

Formal Argumentation

- ▶ In the formal literature
  - ▶ Premises ∼ warrants
  - ▶ Rebuttals ∼ undercuts
  - ▶ Limited study of parallel support
- ▶ An argument is a point
- ▶ Only the attack relation matters
- ▶ A solution is a set of consistent arguments
  - ▶ No member attacks another member
- ▶ Given an attack graph
  - ▶ Determine if it has a unique solution
  - ▶ What that solution is