An Introduction to Computational Argumentation Semantics (1/5)

Srdjan Vesic and Dragan Doder

ESSAI 2024

Let's get to know each other

- Who am I?
- Who are you?
- 5 sessions
- Reader by Henry Prakken
  `https://webspace.science.uu.nl/~prakk101/teaching/casyl22.pdf`

Argumentation theory

- Since ancient times
- Different domains:
  - philosophy
  - linguistics
  - psychology
  - artificial intelligence
  - ...
- Many open questions
- Interesting research challenges

Arguments are everywhere

- Amazon
- YouTube
- idebate
- Debategraph
- Arguman
- kialo

idebate

idebate idea beta
international debate education association

NEWS | DEBATABASE | EVENTS | COMMUNITY | MEDIA | ABOUT

This House believes university education should be free

Nearly every country in the developed world provides both free primary and secondary education. Such education is generally uncontroversial and accepted as necessary by both liberals and conservatives. In the case of higher education however, there is disagreement concerning the statefinancing of said institutions. In many states, students must pay fees to attend university, for which they may seek student loans or grants. Alternatively states may offer financial assistance to individuals who cannot afford to pay fees and in some university education is completely free and considered a citizen's right to attend. Debates center on the issues of whether there is in fact a right to university education, and on whether states can feasibly afford to finance such education.

As a debate meant for a quick introduction for some of our programmes such as Debate in the Neighbourhood this debate is a shorter and simpler version of http://idebate.org/debatabase/debates/funding/house-believes-university-education-should-be-free please read it for more detailed argumentation.

POINTS FOR

The cost to the state is far too great to sustain universal free university education

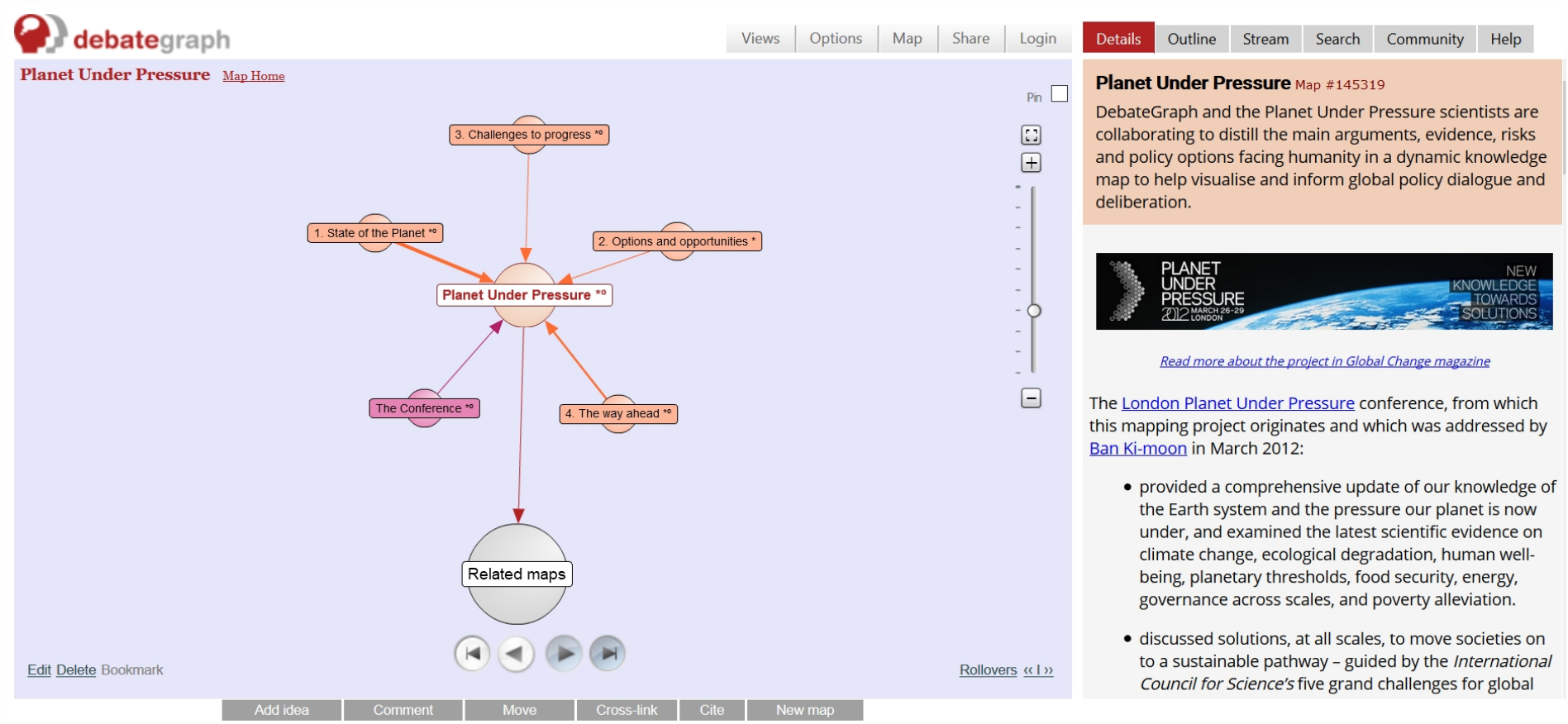
Maintaining a system of free university education leads to an inefficient allocation of state resources.

POINTS AGAINST

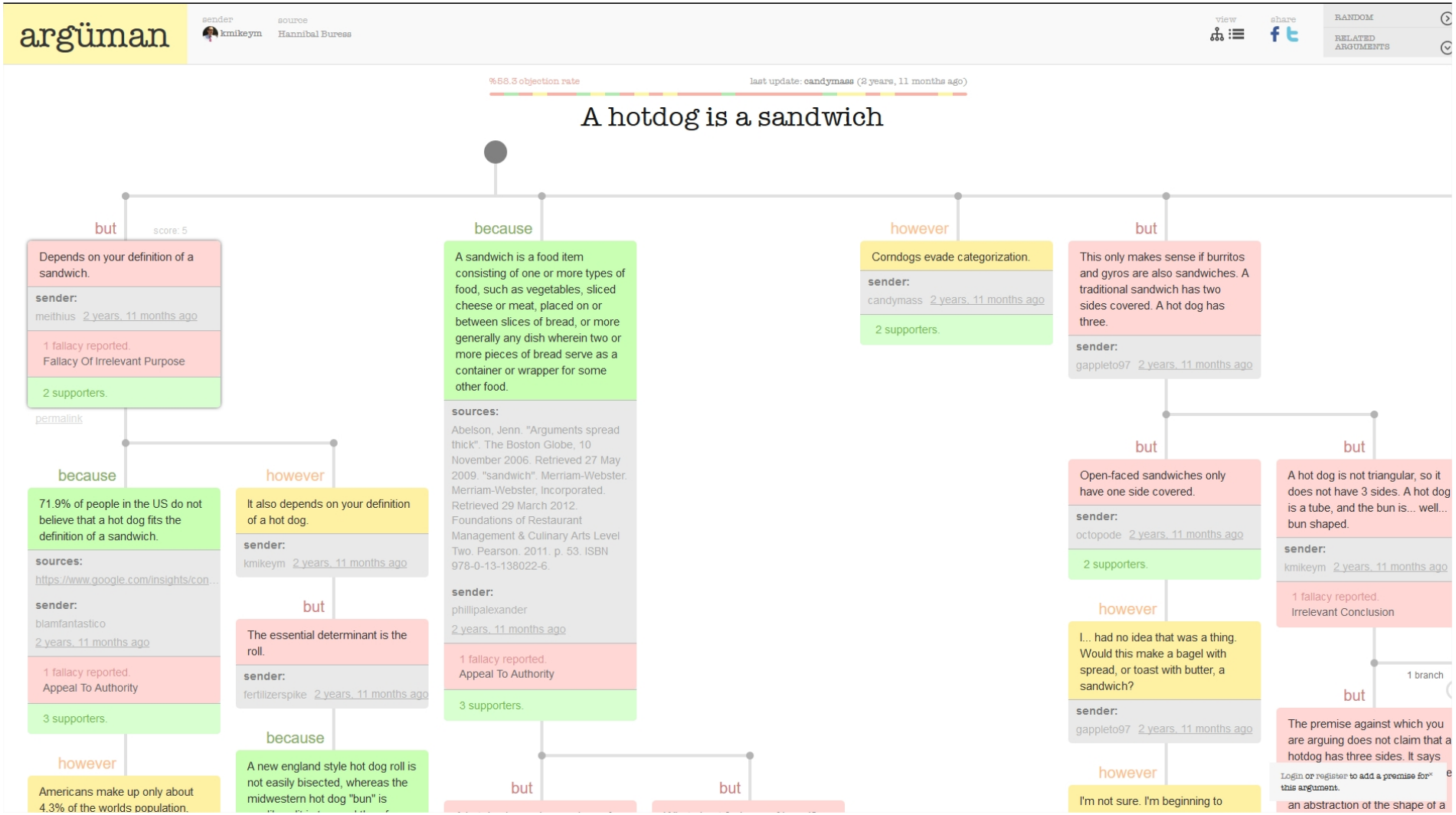
VOTING RESULTS

VIDEO DEBATE

DebateGraph



Arguman


argüman
sender
kmikeym
source
Hannibal Buress
view
share
RANDOM
RELATED ARGUMENTS
%58.3 objection rate
last update: candymass (2 years, 11 months ago)
A hotdog is a sandwich
but
score: 5
Depends on your definition of a sandwich.
sender:
meithius 2 years, 11 months ago
1 fallacy reported.
Fallacy Of Irrelevant Purpose
2 supporters.
permalink
because
71.9% of people in the US do not believe that a hot dog fits the definition of a sandwich.
sources:
https://www.google.com/insights/con...
sender:
blamfantastico
2 years, 11 months ago
1 fallacy reported.
Appeal To Authority
3 supporters.
however
Americans make up only about 4.3% of the worlds population.
however
It also depends on your definition of a hot dog.
sender:
kmikeym 2 years, 11 months ago
but
The essential determinant is the roll.
sender:
fertilizerspike 2 years, 11 months ago
because
A new england style hot dog roll is not easily bisected, whereas the midwestern hot dog "bun" is
because
A sandwich is a food item consisting of one or more types of food, such as vegetables, sliced cheese or meat, placed on or between slices of bread, or more generally any dish wherein two or more pieces of bread serve as a container or wrapper for some other food.
sources:
Abelson, Jenn. "Arguments spread thick". The Boston Globe, 10 November 2006. Retrieved 27 May 2009. "sandwich". Merriam-Webster. Merriam-Webster, Incorporated. Retrieved 29 March 2012. Foundations of Restaurant Management & Culinary Arts Level Two. Pearson. 2011. p. 53. ISBN 978-0-13-138022-6.
sender:
phillipalexander
2 years, 11 months ago
1 fallacy reported.
Appeal To Authority
3 supporters.
but
but
however
Corndogs evade categorization.
sender:
candymass 2 years, 11 months ago
2 supporters.
but
This only makes sense if burritos and gyros are also sandwiches. A traditional sandwich has two sides covered. A hot dog has three.
sender:
gappleto97 2 years, 11 months ago
but
Open-faced sandwiches only have one side covered.
sender:
octopode 2 years, 11 months ago
2 supporters.
however
I... had no idea that was a thing. Would this make a bagel with spread, or toast with butter, a sandwich?
sender:
gappleto97 2 years, 11 months ago
however
I'm not sure. I'm beginning to
but
A hot dog is not triangular, so it does not have 3 sides. A hot dog is a tube, and the bun is... well... bun shaped.
sender:
kmikeym 2 years, 11 months ago
1 fallacy reported.
Irrelevant Conclusion
1 branch
but
The premise against which you are arguing does not claim that a hotdog has three sides. It says
Login or register to add a premise for this argument.
an abstraction of the shape of a

Computational model of argument

Argumentation: an activity of reason aimed at increasing or decreasing the acceptability of a controversial standpoint by putting forward arguments

Exemple : A dialogue between two journalists

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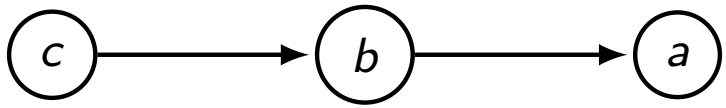
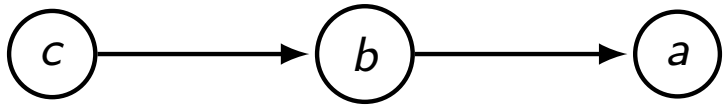
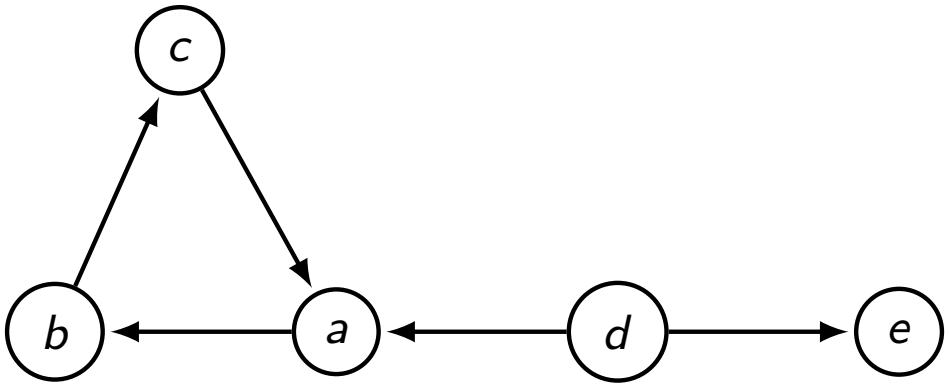


Computational model of argument

- An argumentation graph is a pair $\mathcal{F} = (\mathcal{A}, \mathcal{R})$ where:
  - $\mathcal{A}$ is a finite set of arguments
  - $\mathcal{R}$ is an attack relation ($\mathcal{R} \subseteq \mathcal{A} \times \mathcal{A}$)

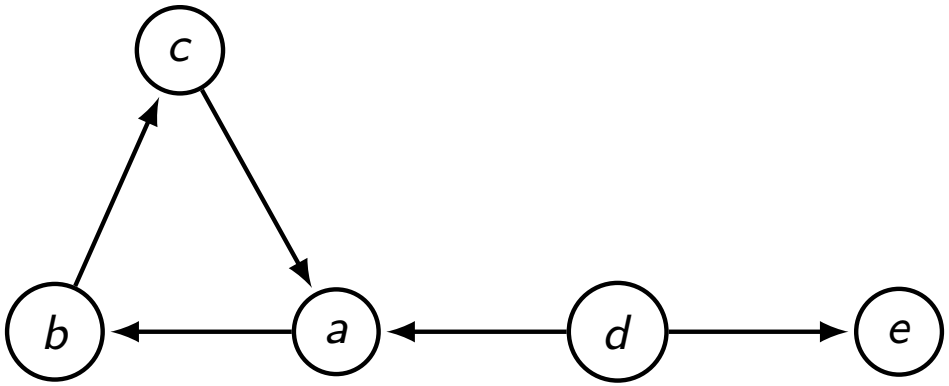


Which arguments to accept?



Which arguments to accept?

- A set S is conflict-free if there are no $a, b \in S$ such that $(a, b) \in R$



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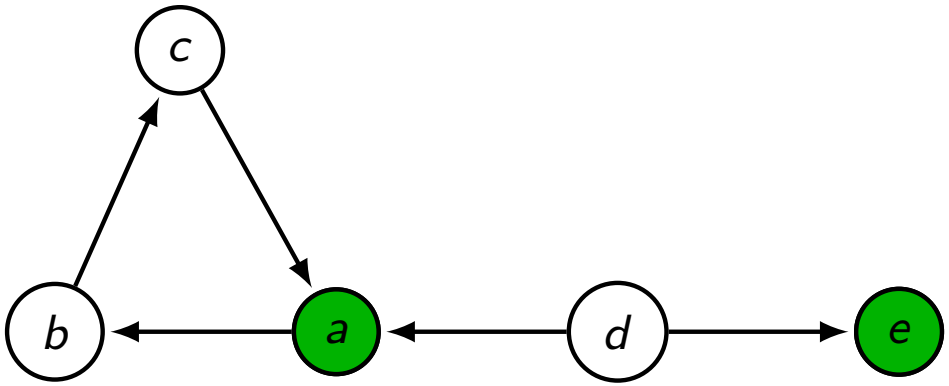
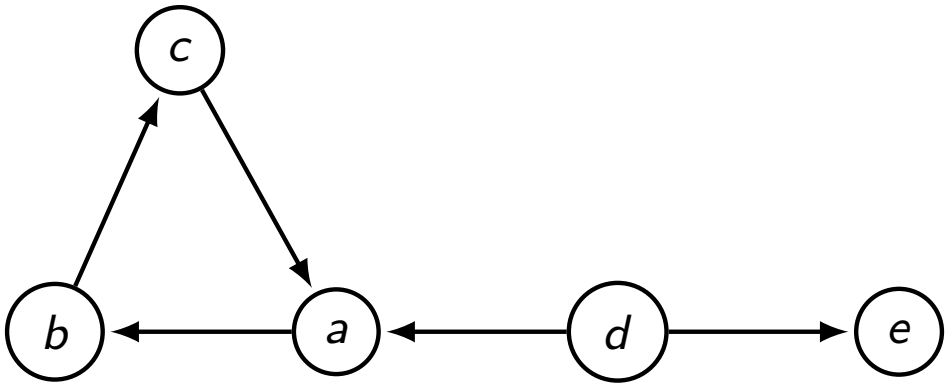


Which arguments to accept?

- A set S is conflict-free if there are no $a, b \in S$ such that $(a, b) \in R$
- A set S defends argument a if for each $b \in A$, if $(b, a) \in R$ then b is attacked by S



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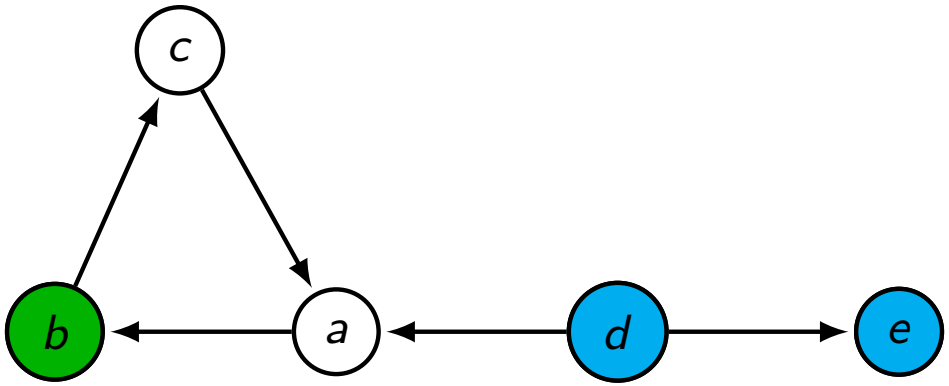

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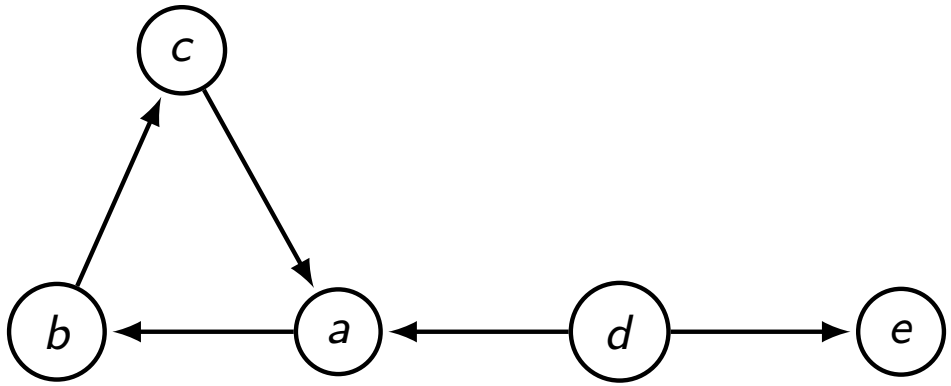
- A set of arguments is admissible if it is conflict-free and each argument of the set is defended by that set



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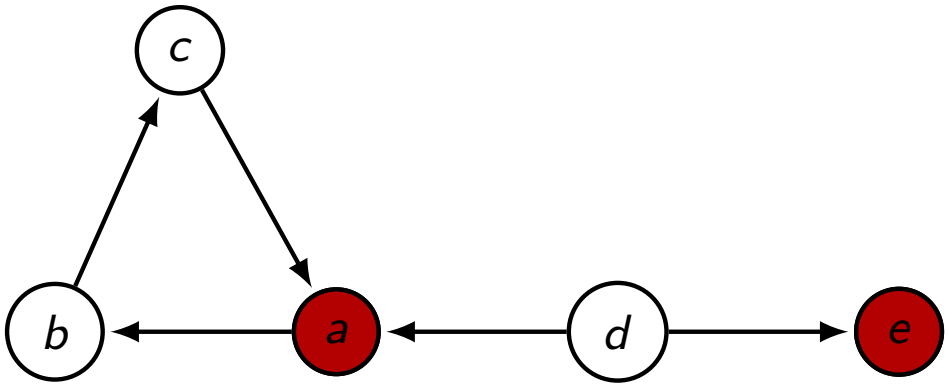

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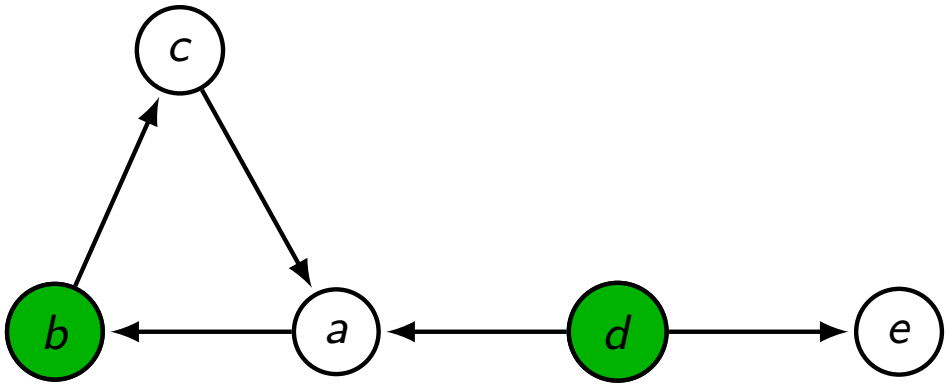

Different acceptability semantics

- S is a complete extension if it is an admissible set and every argument defended by S belongs to S

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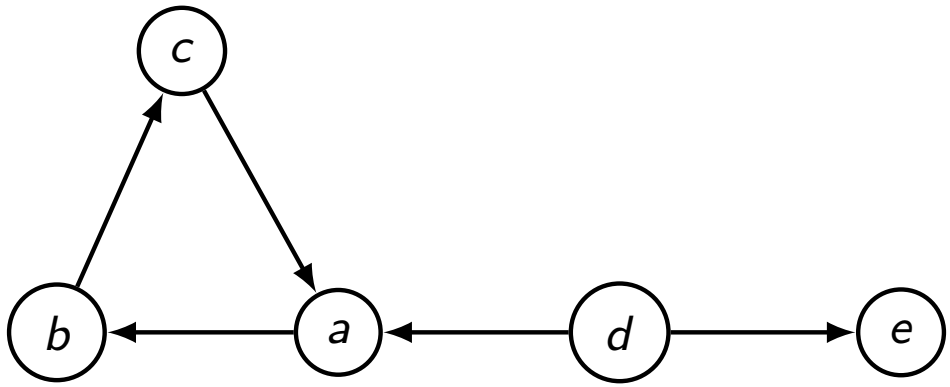

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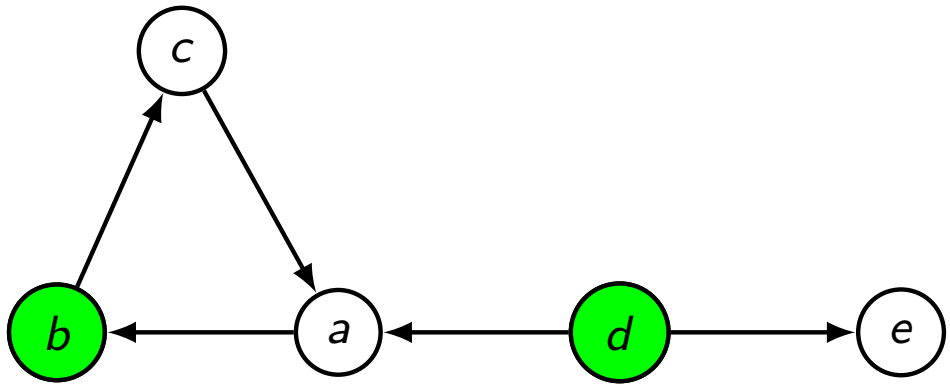

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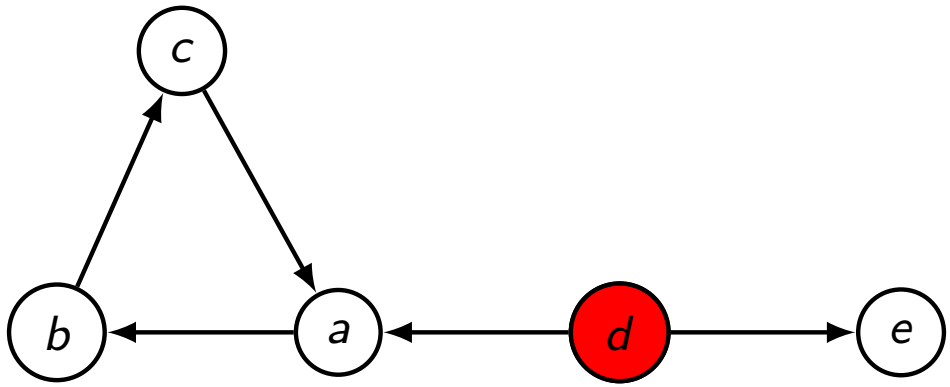

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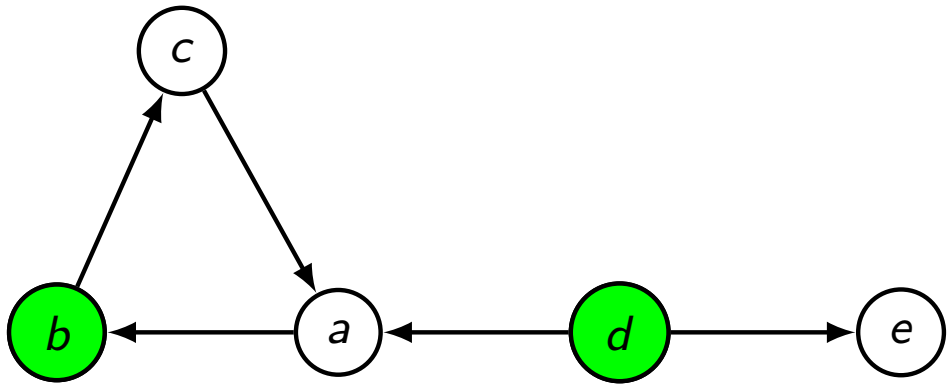

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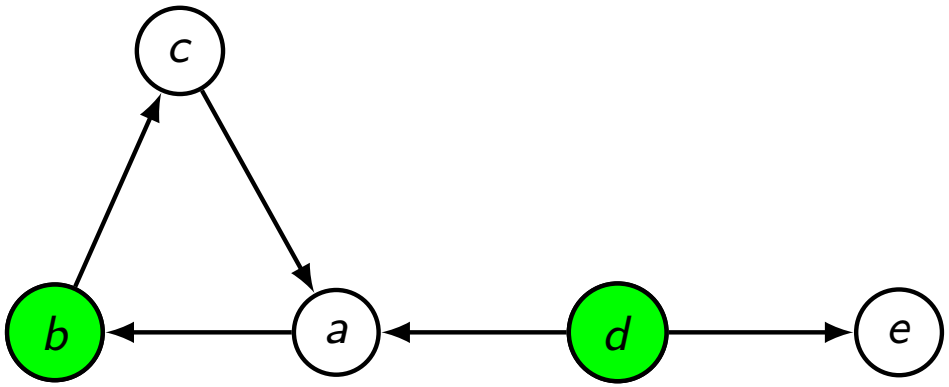

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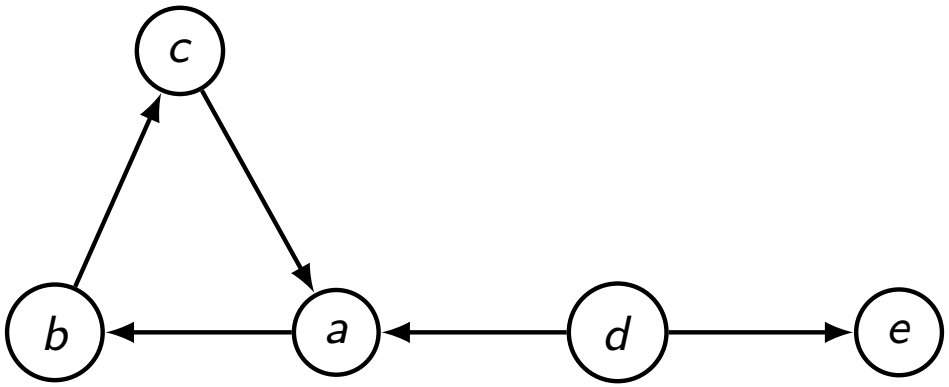

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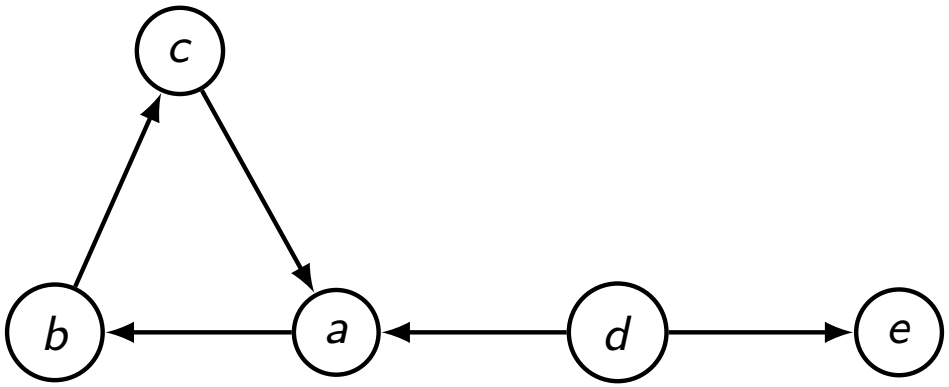

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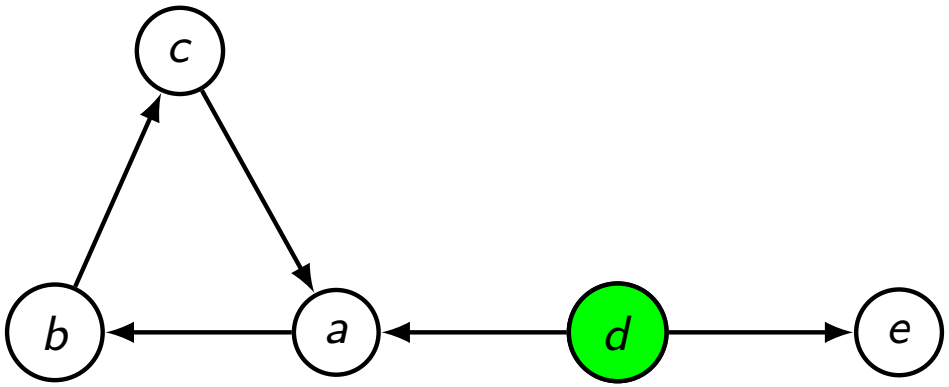

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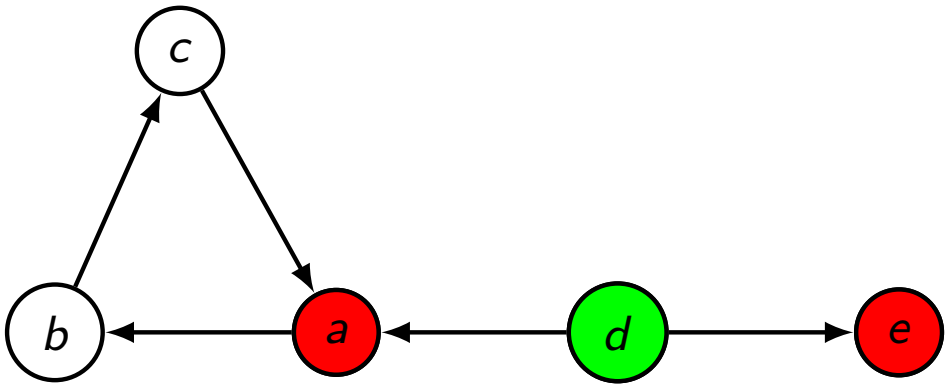

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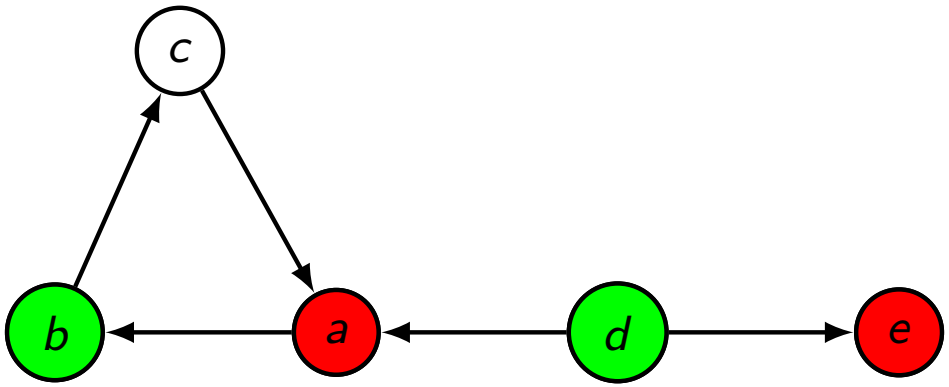

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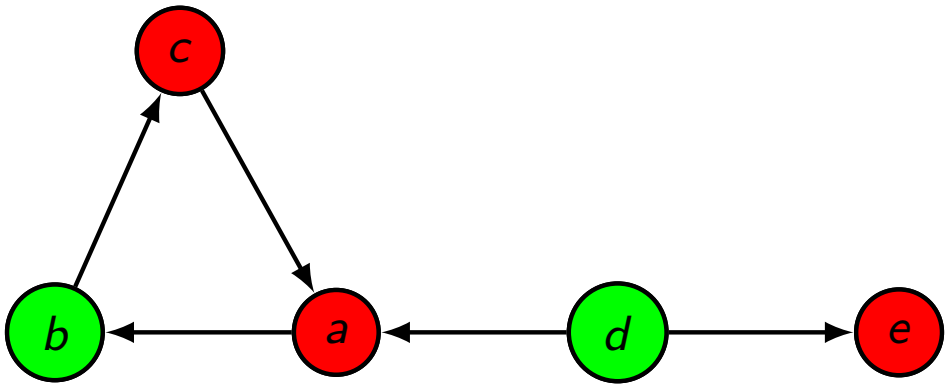

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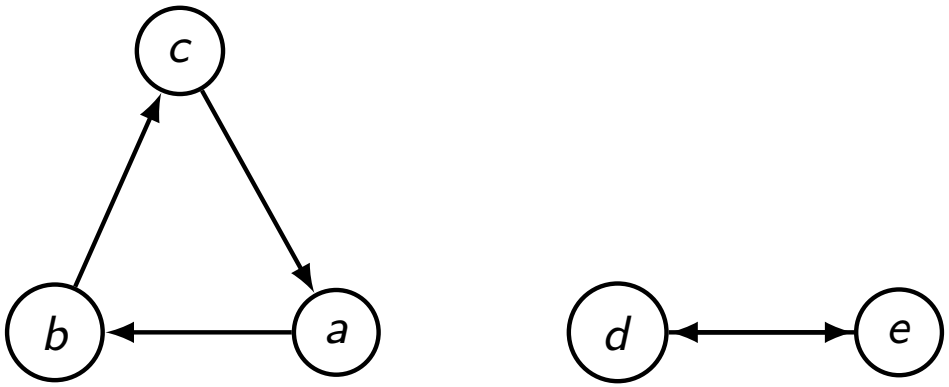

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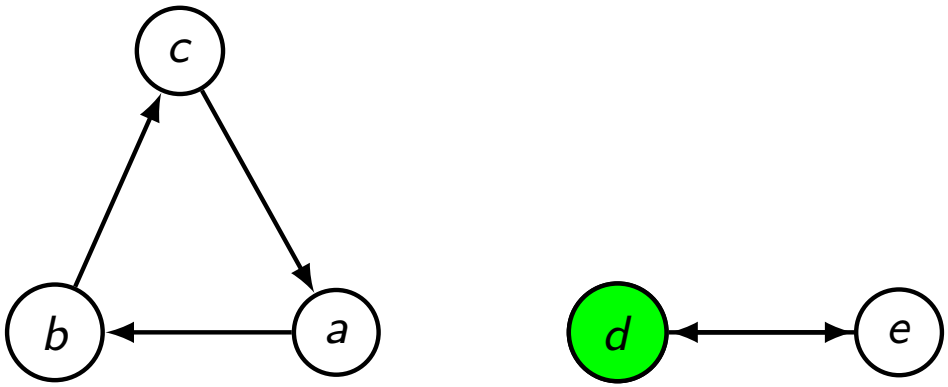

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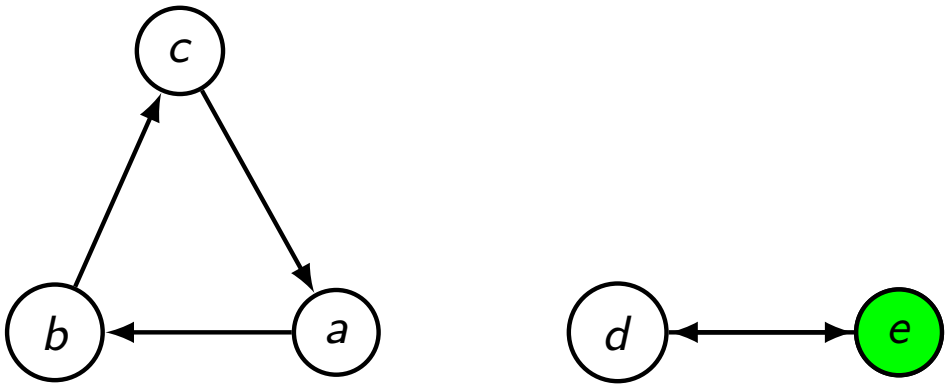
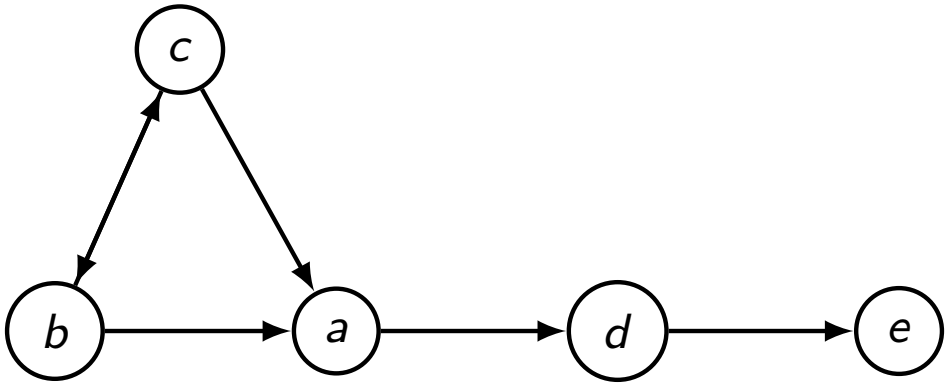


Exercise



Calculate stable, preferred, complete and grounded extensions

Advanced exercise

Provide a proof or find a counter example:

- Every stable extension is a preferred extension

Advanced exercise

Provide a proof or find a counter example:

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- Every preferred extension is a complete extension

Advanced exercise

Provide a proof or find a counter example:

- Every stable extension is a preferred extension
- Every preferred extension is a complete extension
- Find a preferred extension that is not stable

Advanced exercise

Provide a proof or find a counter example:

- Every stable extension is a preferred extension
- Every preferred extension is a complete extension
- Find a preferred extension that is not stable
- Find an argumentation graph that has at least one stable extension and that has a preferred extension that is not stable