Reasoning for Humans: Clear Thinking in an Uncertain World

PHIL 171

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Course Overview

First Steps

https://umd.instructure.com/courses/1311208/pages/first-steps?module_item_id=10851917

First Steps

1. Watch the introductory video:
   https://umd.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=82079806-02c6-4109-8617-ad91016d853e
2. Make sure you are signed up and can login to Campuswire https://campuswire.com/c/GCDE50B76/feed.
3. Sign up for https://app.tophat.com/e/020609 with join code 020609. *You must purchase the pro-subscription*.
4. Watch the video introducing the online tools we will use this semester:
   https://umd.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=043b0d80-c54e-434e-ab1a-ad91010aac68
5. Read the syllabus (https://umd.instructure.com/courses/1311208/assignments/syllabus).

First Steps - Assignments

1. Introductory quiz on Tophat:
   `https://app.tophat.com/e/020609/page/316433585`
2. Problem Set 1: `https://umd.instructure.com/courses/1311208/assignments/5707149`

Grading

Participation	25%
Problem Sets	40%
Exam 1	10%
Exam 2	10%
Final Exam	15%

Online Tools

Course Website:	umd.instructure.com/courses/1311208
Online Notes:	text.phil171.org
Online Discussion:	campuswire.com/c/GCDE50B76/feed
Participation Questions:	app.tophat.com/e/020609

Topics

- Introduction (Reasoning, Arguments and Inferences)
- Logic
- Logic and Reasoning
- Probability
- Probabilistic Inference
- Other topics: Lottery Paradox, The Grue Paradox, Bayesian Epistemology, ...

Introduction to Reasoning

Reasoning

Reasoning is a "transition in thought, where some beliefs (or thoughts) provide the ground or reasons for coming to another"

J. Adler. *Introduction: Philosophical Foundations (Sections 1 - 4)*. in *Reasoning: Studies in Human Inference and its Foundations*, Cambridge University Press, 2008.

I need to make breakfast for my daughter at 6:30am.

Oh, I better put the slides on the website.

I need to make breakfast for my daughter at 6:30am.

~~Oh~~ **So**, I better put the slides on the website.

My keys are either in my office or locked in my car.

My keys are not in my office.

So, my keys are locked in my car.

Bill brought his backpack to class every day of the semester.

So, [probably] Bill will bring it to the next class.

What are the rules or formal constraints that govern *rational* transitions in thought?

Logic

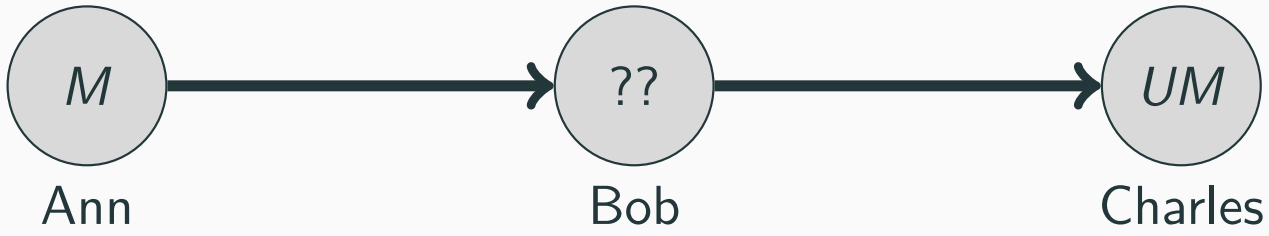
Logic - Both a very old and very modern discipline

Question

Ann is looking at Bob, and Bob is looking at Charles. Ann is married and Charles is not married.

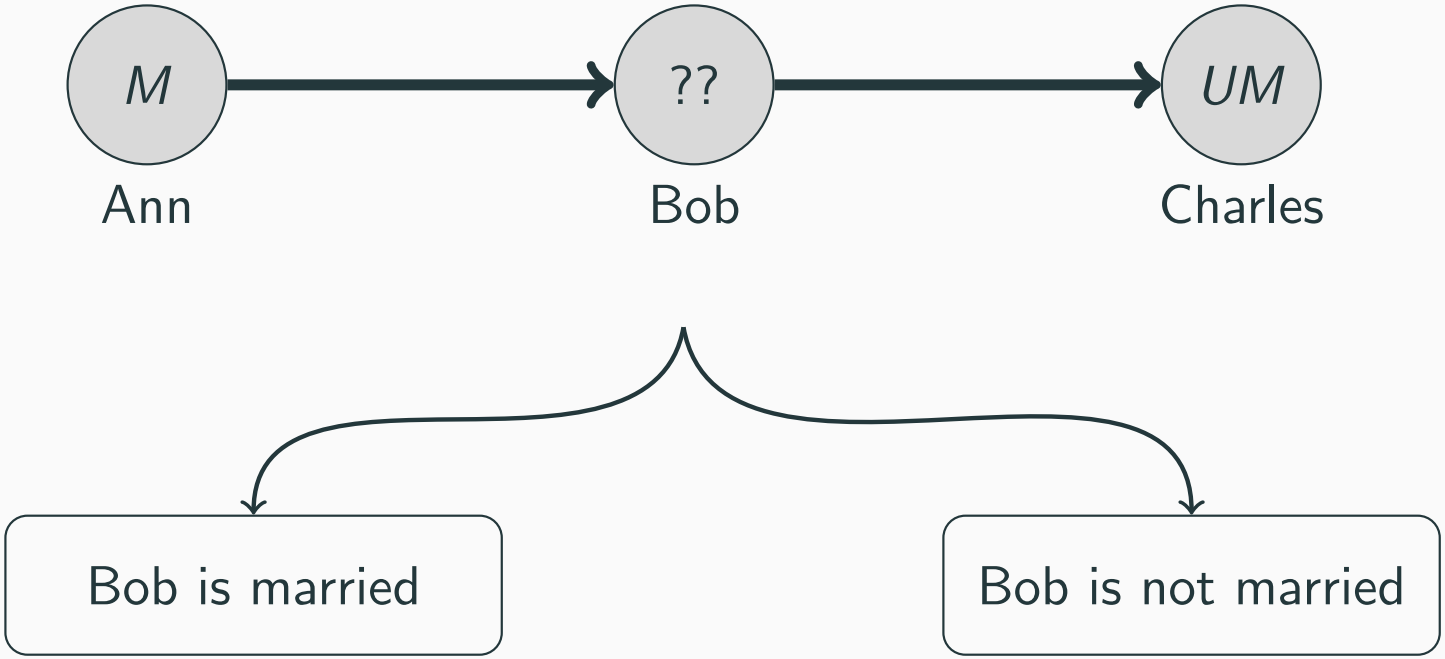
Question

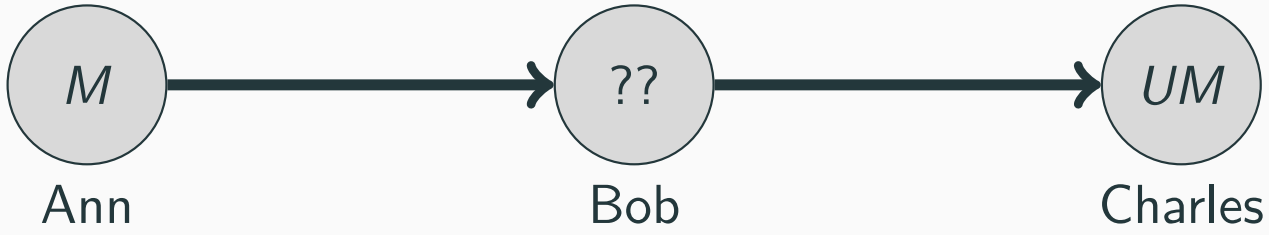
Ann is looking at Bob, and Bob is looking at Charles. Ann is married and Charles is not married.



Is it true that a married person is looking at an unmarried person?

1. Yes.
2. No.
3. There is not enough information to answer this question.


M
??
UM
Ann
Bob
Charles
Bob is married
Bob is not married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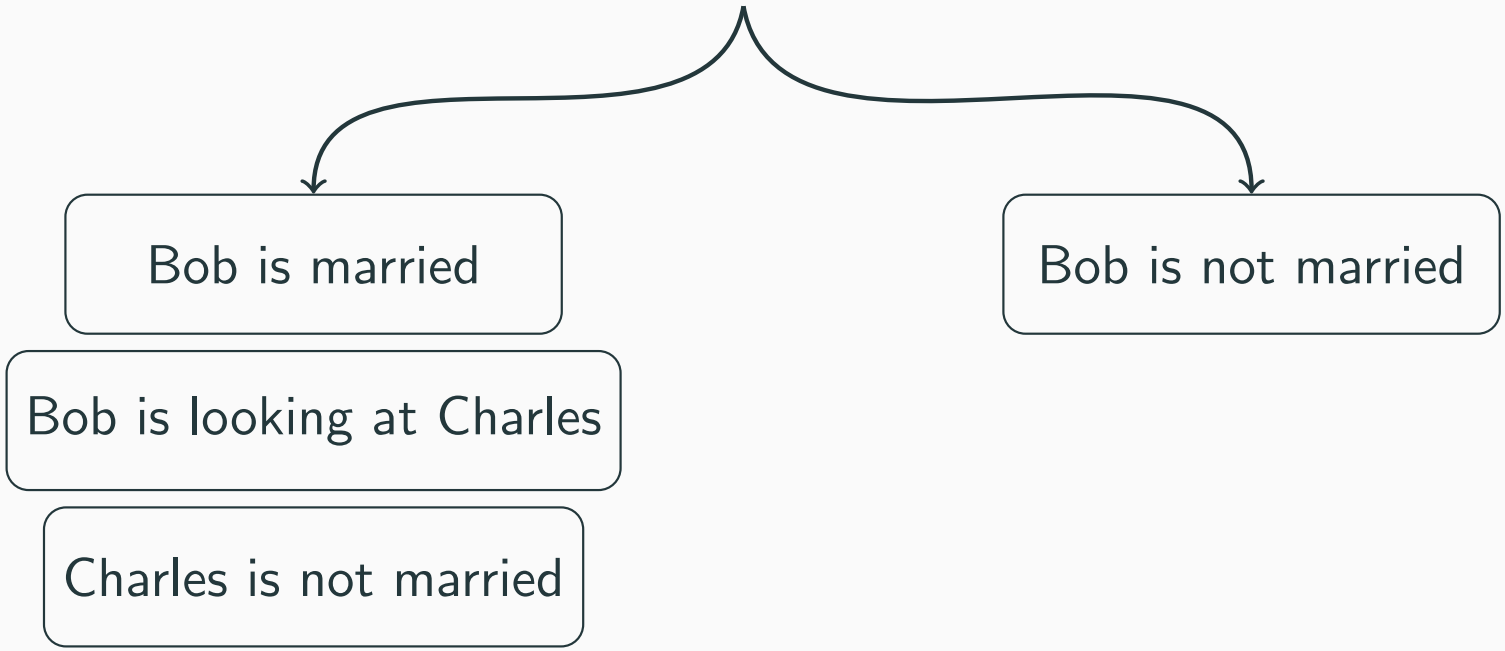
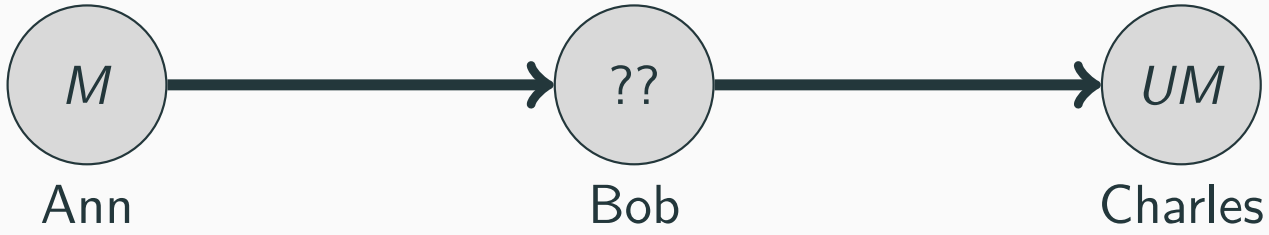

Bob is married
Bob is not married
Bob is looking at Charles
Charles is not married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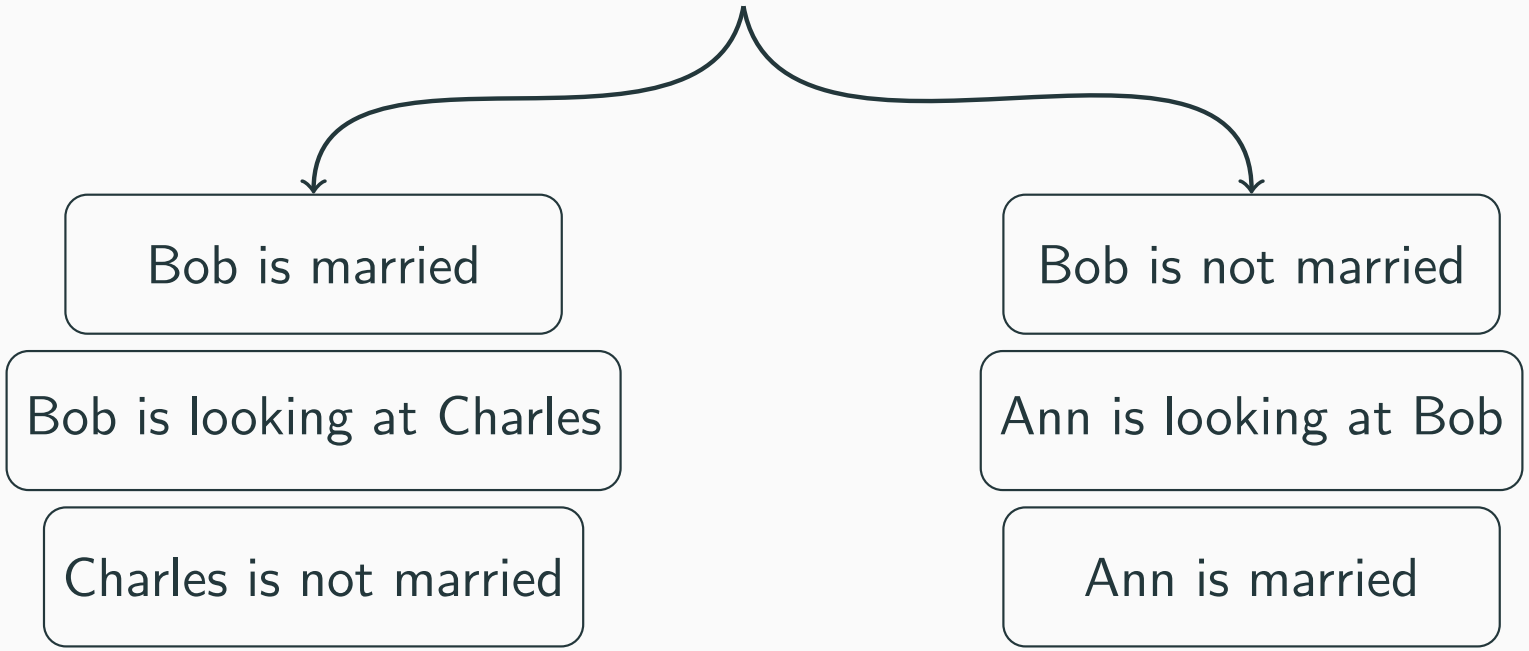
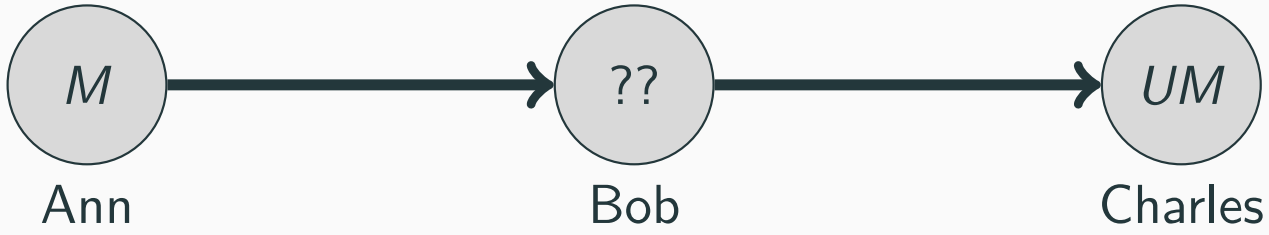

Bob is married
Bob is looking at Charles
Charles is not married
Bob is not married
Ann is looking at Bob
Ann is married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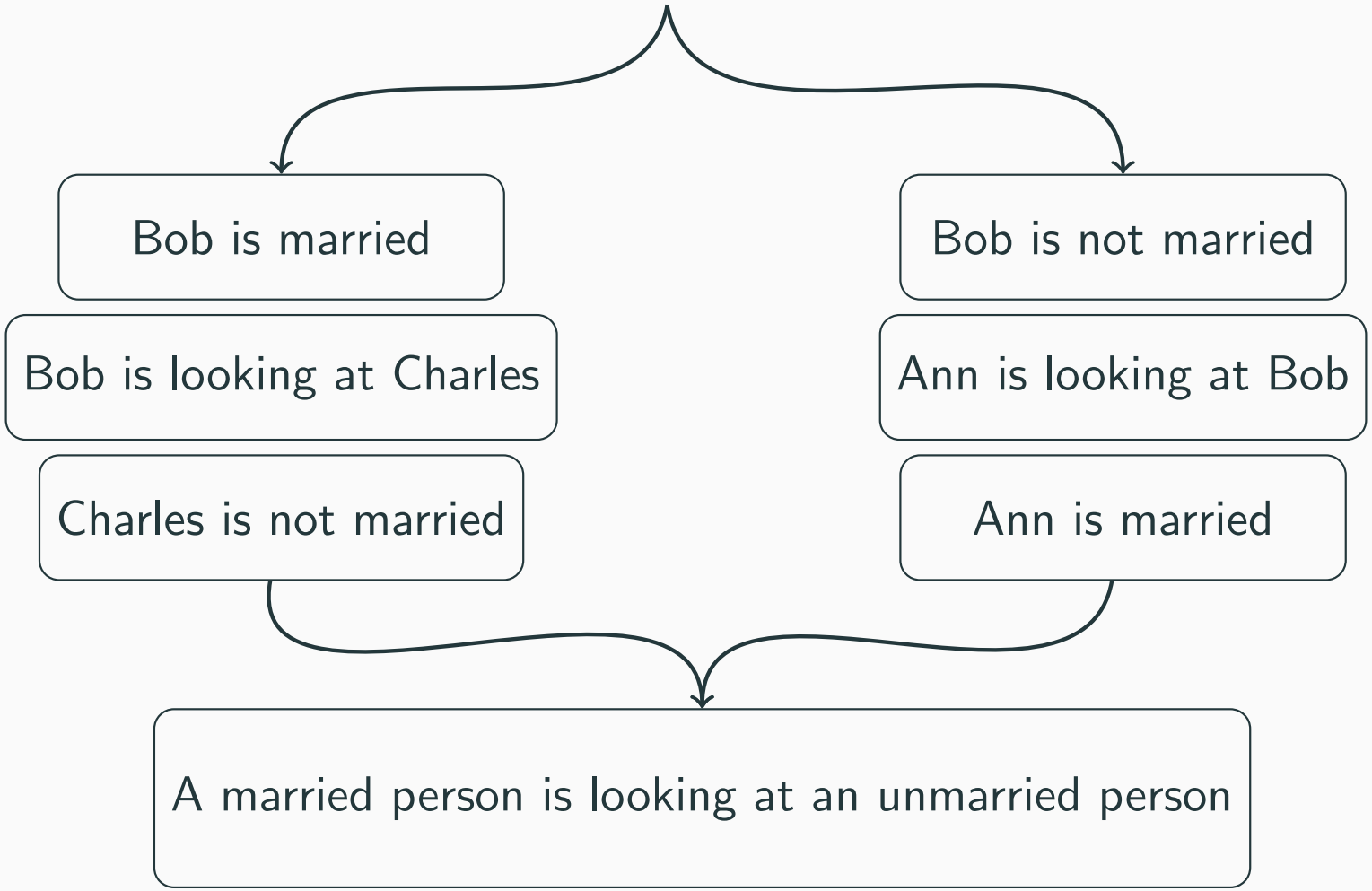
Bob is married
Bob is not married
Bob is looking at Charles
Ann is looking at Bob
Charles is not married
Ann is married
A married person is looking at an unmarried person

Introductory Topics

- Arguments
- Declarative sentences, propositions
- Representing arguments: $P_1, P_2, P_3 \Rightarrow C$
- Argument form
- Valid arguments and inferences

Arguments

The word "argument" can mean several different things:

- ✓ Ann and Bob are having an argument.
- ✓ Ann is advancing the argument that such-and-such is true.
- ✓ The value of a function depends on the value of its arguments.

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One advances an argument by giving certain reasons designed to persuade the reader/hearer that a certain claim is correct.

Arguments

An **argument** is a list of statements, one of which is designated as the **conclusion**, and the rest of which are designated as **premises**.

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Conclusion Indicators

therefore hence for this reason

thus implies that entails that so

it must be that we may infer wherefore

it follows that we may conclude that

consequently as a result accordingly

Declarative Sentences

A sentence is **declarative** if it makes a statement: that is, if it asserts something.

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Examples

Amsterdam is in The Netherlands.

Helsinki is in Norway.

Textbooks are free in all of my courses.

The Terps beat the Buckeyes in football.

Declarative Sentences, Commands, Questions

Attendance is mandatory. (declarative)

Show up to the lectures! (imperative)

Are you coming to class today? (interrogative)

Indexical Sentences

I have been in the Skinner building.

My computer was stolen.

The dog ate the steak yesterday.

Terminology: Proposition

The premises and conclusion of an argument are not the declarative sentences we use to express the argument, but rather the *meanings* of those declarative sentences.

A **proposition** is something that can be true or false.

Some logic/philosophy texts use "statement" or "claim" instead of "proposition".

Many sentences can express the same proposition

1. I have taken logic before.
2. I took logic.
3. This is not the first time I have taken logic.

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1. There is a cat in the teapot.
2. Hay un gato en la tetera.
3. Il y a un chat dans la théière.
4. Eine Katze ist in der Teekanne.
5. Er is een kat in de theepot

A sentence may express different propositions

1. Ann bumped into the main with an umbrella.
2. No student solved exactly two problems.

Summary

A sentence is **declarative** if it makes a statement: that is, if it asserts something.

A **proposition** is something that can be true or false. It is the statement expressed by a declarative sentence.

The premises and conclusion of an **argument** are not the declarative sentences we use to express the argument, but rather the *propositions* expressed by those declarative sentences.

Some logic/philosophy texts use "statement" or "claim" instead of "proposition".