Phil. 1200: Critical Thinking

Midyear Exam Review

Midterm Review

Validity & Soundness

Definitions:

Validity – A structural property of arguments. An argument is valid if and only if there is no logically possible situation in which the premises are true and the conclusion is false.

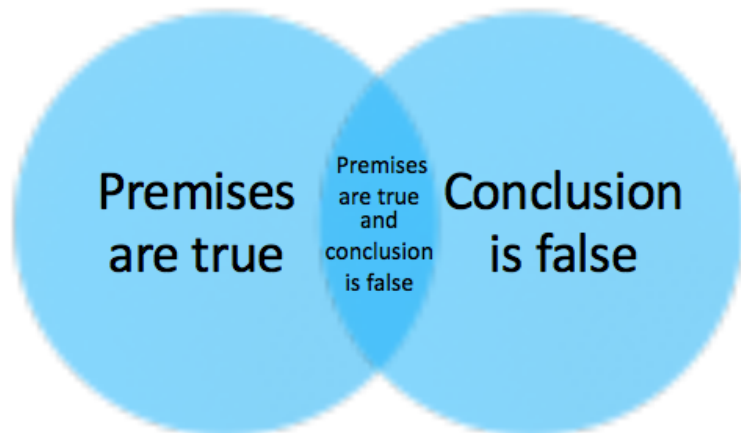**Invalidity** – An argument is invalid just in the case that it is not valid.

Validity & Soundness

What is required for invalidity?

- In order for an argument to be invalid, there has to be a logically possible situation in which the premises are true and the conclusion is false

Premises are true

Premises are true and conclusion is false

Conclusion is false

Validity & Soundness

Definitions:

Soundness – A two-fold property of arguments; an argument is sound if it:
(A) is valid and
(B) has all true premises.
By definition, a sound argument proves its conclusion.

True or False

A) If the conclusion of an argument is true, then some or all of the premises are true.

True or False

A) If the conclusion of an argument is true, then some or all of the premises are true.

False

True or False

B) If the premises of an argument are false, then the conclusion is also false.

True or False

B) If the premises of an argument are false, then the conclusion is also false.

False

True or False

E) If an argument is valid but unsound, its conclusion must be false.

True or False

E) If an argument is valid but unsound, its conclusion must be false.

False

True or False

F) If all the premises and the conclusion of an argument are true, this still does not imply that the argument is valid.

True or False

F) If all the premises and the conclusion of an argument are true, this still does not imply that the argument is valid.

True

True or False

G) If the conclusion of a valid argument is true, the argument is sound.

True or False

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False

True or False

H) If an argument is invalid, then whenever the premises are all false, the conclusion must also be false.

True or False

H) If an argument is invalid, then whenever the premises are all false, the conclusion must also be false.

False

True or False

I) A valid argument must have a true conclusion.

True or False

I) A valid argument must have a true conclusion.

False

Necessary and Sufficient Conditions

Sufficient condition: X is a sufficient condition for Y just in case X guarantees Y.

Ex.) Being a square is sufficient for having four sides.

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If X, then Y.

Necessary and Sufficient Conditions

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Ex.) Being a square is sufficient for having four sides.

If X, then Y.

If something is red, then it is coloured.

Necessary and Sufficient Conditions

Necessary condition: X is a necessary condition for Y just in case X is required for Y.

Ex.) Having four sides is necessary for being a square.

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Ex.) Having four sides is necessary for being a square.

If A and B and C and ... X, then Y.

Necessary and Sufficient Conditions

Necessary condition: X is a necessary condition for Y just in case X is required for Y.

Ex.) Having four sides is necessary for being a square.

If A and B and C and … X, then Y.

You must pay the cover charge to be allowed to enter the club!

Necessary and Sufficient Conditions

If A and B and C and … X, then Y.

If Y, then A.   If you were allowed to enter the club, then you paid the
If Y, then B.   cover charge.
If Y, then C.

·   If you were allowed to enter the club, then you were not
                       too drunk.
·

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If Y, then X.   If you were allowed to enter the club, then you were not
                       naked.

Possibility

Logical possibility: If something is not contradictory.

Nomological possibility: If something does not contradict the laws of nature.

Possibility

Exercises

Suppose that there are not X's in the world. What follow?

A. The existence of X's is nomologically impossible.

B. The existence of X's is logically impossible.

C. Neither of the above.

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A. The existence of X's is nomologically impossible.

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Exercises

Suppose that P is nomologically necessary for Q. Which of the following claims must be true?

A. It is nomologically impossible for P to obtain without Q obtaining.
B. It is nomologically impossible for Q to obtain without P obtaining.
C. It is logically impossible for Q to obtain without P obtaining.
D. It is logically impossible for Q to obtain without P obtaining.

Exercises

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A.   It is nomologically impossible for P to obtain without Q obtaining.
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D.   It is logically impossible for P to obtain without Q obtaining.

Exercises

Suppose that an argument is valid. What follows from this?

A. It is logically impossible for its premises to be false.
B. It is logically impossible for its premises to be true and its conclusion false.
C. It is logically impossible for its conclusion to be true and its premises false.
D. If all of its premises are true, then the argument is sound.

Exercises

Suppose that an argument is valid. What follows from this?

A. It is logically impossible for its premises to be false.
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Exercises

Being a sound argument is _____ for being a *good* argument.

A.   Necessary.
B.   Sufficient.
C.   Necessary and sufficient.
D.   Neither necessary nor sufficient.

Exercises

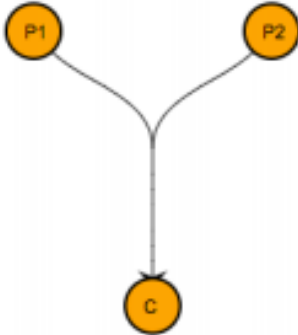Being a sound argument is _____ for being a *good* argument.

A. Necessary.
B. Sufficient.
C. Necessary and sufficient.
D. Neither necessary nor sufficient.

Argument Mapping

Argument 1:
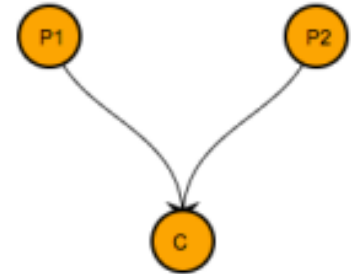(P1)   All horses are mammals.
(P2)   All mammals are warm-blooded.
(C)   All horses are warm-blooded.

Argument 2:
(P1)   My neighbour says she has a car.
(P2)   I've seen a car in my neighbour's garage.
(C)   My neighbour has a car.

Co-premises   Independent Premises

Argument Mapping

(P1) Trolls live under bridges.
(P2) Anything that lives under a bridge is miserable.
(P3) Trolls eat people.
(P4) Eating people gives trolls stomach aches.
(P5) Having a stomach ache makes one miserable.
_____
(C) Trolls are miserable.

Argument Mapping

(P1) Internet trolls harass people online.
(P2) Harassing people online is a sign of being dissatisfied with your life.
(P3) Those who are dissatisfied with their lives are disconnected from society.
(P4) Being disconnected from society makes one miserable.
(P5) Internet trolls show many signs of being miserable.
_____
(C) Internet trolls are miserable.

Argument Mapping

(P1) People often go to the beach when the weather is hot.
(P2) It's hot in the summer.
(P3) People often go to the beach in the summer.
(P4) People are exposed to a lot of sun at the beach.
(P5) When people are exposed to a lot of sun, they often get sunburns.
(P6) People often get sunburns at the beach.
_____
(C) People often get sunburns in the summer.

Argument Mapping

Many people text and drive. But this is a very bad idea. It can easily cause an accident, since texting takes your eyes off the road for a few seconds, and during that time you might cause an accident. Even if you're not worried about accidents, texting and driving can also land you a heavy fine. Nowadays, police are riding in buses to catch drivers texting and driving . So, you are more likely to get caught than ever before.

Argument Mapping

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Argument Mapping

P1: Texting and driving can easily cause an accident.

P2: You have to take your eyes off the road to text while driving.

P3: In the time you are texting and not watching the road you might cause an accident.

P4: Texting and driving can get you a heavy fine.

P5: Nowadays, police are riding in buses trying to catch drivers who are texting.

P6: You are more likely to get caught texting and driving nowadays.

_____

C: Texting and driving is a very bad idea.