

Homework: Valid/Invalid Informal Analysis

1.

The capital of Massachusetts is Boston.

Boston is the home of the Boston Red Sox.

Therefore, the capital of Massachusetts is the home of the Boston Red Sox.

a) On the assumption of true premises, must the conclusion be true if the premises are true (in other words, is the argument valid?)

Yes, to illustrate this, assume the conclusion is false (that Mass. Is NOT the home of the Boston Red Sox), then one of the premises must be false too. Hence it is impossible to have a false conclusion with all true premises (which is the definition of a valid argument)

b) If the argument is invalid (which means the conclusion could be false even with all true premises)- come up with a counter-example (premise) such that if the new premise were true, the truth of the original premises does not change, but the conclusion to the argument is no longer guaranteed.

3.

Every horse that has ever been observed has had a heart.

Therefore, every horse yet to be observed will have a heart.

a) On the assumption of true premises, must the conclusion be true if the premises are true (in other words, is the argument valid?)

No.

b) If the argument is invalid (which means the conclusion could be false even with all true premises)- come up with a counter-example (premise) such that if the new premise were true, the truth of the original premises does not change, but the conclusion to the argument is no longer guaranteed.

The argument is invalid. Add the following premise: *Today a horse will be observed born without a heart.* This additional premise does NOT make the existing premise false (why?), but makes the conclusion false, hence it is possible to add a new premise that does not change the truth of the existing premise, but makes the conclusion false.

5.

If it rains hard and long in the Tucson area, then the washes fill with water.

The Tanque Verde wash near Tucson is full of water.

Therefore it must had rained hard and long in the Tucson area.

a) *On the assumption of true premises, must the conclusion be true if the premises are true (in other words, is the argument valid?)*

No.

b) *If the argument is invalid (which means the conclusion could be false even with all true premises)- come up with a counter-example (premise) such that if the new premise were true, the truth of the original premises does not change, but the conclusion to the argument is no longer guaranteed.*

The argument is invalid. Add: *“The Tucson area experienced rapid snowmelt during the first week of June which caused the washes to flood”*. Note that this does not change the truth of the existing (stated) premises, but makes it possible to have a false conclusion.

7.

I once had a bad case of the flu, and took zinc supplements and felt better the next day.
Therefore, zinc supplements help alleviate the flu.

a) *On the assumption of true premises, must the conclusion be true if the premises are true (in other words, is the argument valid?)*

No.

b) *If the argument is invalid (which means the conclusion could be false even with all true premises)- come up with a counter-example (premise) such that if the new premise were true, the truth of the original premises does not change, but the conclusion to the argument is no longer guaranteed.*

The argument is invalid. Add, *“Another time I had a bad case of the flu and took zinc supplements, but my flu symptoms worsened”*. Note that this does not change the truth of the existing (stated) premise, but makes it possible to have a false conclusion.

9.

Kaiser Permanente, one of the nation's largest managed care organizations, has ordered its pharmacies to stop dispensing Bextra, an arthritis and pain drug made by Pfizer that some tests have indicated may increase the risk of heart attacks and strokes.

Therefore, one should not take Bextra.

a) *On the assumption of true premises, must the conclusion be true if the premises are true (in other words, is the argument valid?)*

No.

b) *If the argument is invalid (which means the conclusion could be false even with all true premises)- come up with a counter-example (premise) such that if the new premise were true, the*

truth of the original premises does not change, but the conclusion to the argument is no longer guaranteed.

The argument is invalid. Add, "Other tests did not produce the same result"