Introduction to Logical Reasoning
Workshop on Creating Valid and Invalid Arguments

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Part 1, Problem 1 Solution

A valid argument with one true premise, one false premise, and a false conclusion:

1. Qatar has more people than Bahrain.   [*True*]
2. Bahrain has more people than Iran.   [*False*]

∴ Qatar has more people than Iran.   [*False*]

The transitivity of "more people than" reveals that assuming the truth of the premises guarantees the truth of the conclusion. So it is a *valid* argument.

Part 1, Problem 2 Solution

An invalid argument with two false premises and a true conclusion:

1. Bahrain has more people than Qatar.   [*False*]
2. Qatar has more people than Iran.   [*False*]

∴ Iran has more people than Qatar.   [*True*]

Assuming that both premises are true implies that Bahrain must have more people than Iran. But this is exactly the opposite of the conclusion. So the conclusion is false when the premises are true. So this is an *invalid* argument.

Part 2, Problem 1 Solution

An invalid argument with two true premises and a true conclusion:

1. Qatar has more people than Bahrain.   [*True*]
2. Iran has more people than Bahrain.   [*True*]

∴ Iran has more people than Qatar.   [*True*]

It is perfectly possible to assume the premises are true while the conclusion is false. This is because assuming that it is true that Iran and Qatar each have more people than Bahrain tells us nothing about how Iran and Qatar compare in population size. So this is an *invalid* argument.

Part 2, Problem 2 Solution

An valid argument with two false premises and a true conclusion:

1. Syria has more people than any GCC member. [*False*]
2. Israel is a member of the GCC. [*False*]

∴ Syria has more people than Israel. [*True*]

Assuming the first premise is true sets up a relationship ("more people than") between Syria and each GCC member. Assuming that the second premise is true means that Israel is in the GCC. As a result, Syria must have that same relationship ("more people than") with Israel. Indeed, this is what the conclusion says. So the conclusion must be true, and this is therefore a *valid* argument.

Part 2, Problem 3 Solution

A valid argument with two true premises and a false conclusion:

This is *impossible* to construct! Why? Because if an argument is valid *and* its premises are in fact true, then the conclusion absolutely must be true!

Recall that a valid argument with two true premises is a *sound* argument. And a sound argument gives us a 100% guarantee of the truth of its conclusion.

Next Class…

You begin the journey into formal logic by learning how to transform statements from English into the symbols of logic.

Also, please don't forget to turn in your response to the Workshop #4 Questionnaire on your way out.