

PHIL 105 class 5 - Unit 3: statement logic

Summary

We can connect statements with the **conjunction AND** and the **disjunction OR**. We can negate things with **NOT**.

Truth values and logical operators

The letters stand for truth values.

negation ~

1. The moon revolves around the earth.
2. The moon does **not** revolve around the earth.

Says that the other statement is false.

1 says 2 is false and 2 says 1 is false.

1 is the negation of 2 and 2 is the negation of 1.

negations can be stacked: $\sim\sim A$ - it's FALSE that A is FALSE

conjunction AND

1. The moon revolves around Earth and Earth revolves around the sun.

- **Although** I don't have a girlfriend I do know a girl who'd be real mad if she heard me say that

Although acts as an **AND**

disjunction OR

Earth is a giant disc or a giant cube.

Either Earth must be a giant disc or earth must be a giant cube.

Inclusive

At least one must be true.

Exclusive XOR

Exactly one must be true

Truth tables

| A | B | $\sim A$ | A and B | A or B | A XOR B |
|---|---|----------|---------|--------|---------|
| T | T | F | T | T | F |
| T | F | F | F | T | T |
| F | T | T | F | T | T |
| F | F | T | F | F | F |

P AND Q

P

Valid

Disjunctive syllogism

The zombies got abby or they got bob.

But they didn't get abby,
so they must have got bob

let A = Zombies got abby

let B = Zombies got bob

Pattern

A OR B

NOT A

B

Next up... conditionals