

# 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

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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

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P AND Q

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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

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B

Next up... conditionals