Logical !

Operators

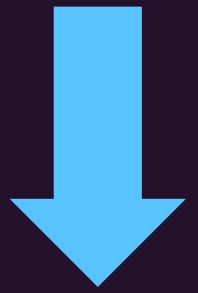
How do we form compound logical statements?

- IF there is a pandemic **AND** I am in public, THEN I'll wear a mask.
- IF it is raining **OR** it is cold, THEN I'll grab my jacket.
- IF it is **NOT** a COMP110 assignment, THEN I will procrastinate.

The **and** operator

- The **and** keyword is a `boolean` operator

```
[boolean a] and [boolean b]
```



```
boolean value
```

- If **both expressions** connected by the **and** symbol **are True**, then the resulting boolean will be **True**. Otherwise it will be **False**.

and truth table

	True	False
True	True	False
False	False	False

You read a truth table like a multiplication table. Start with a finger on one column label and one row label, per each side of the operator, and trace your way in.

The `or` operator

- The `or` keyword is a `boolean` operator

```
[boolean a] or [boolean b]
```

`boolean value`

- If **either expression** connected by the `or` symbol **is True**, then the resulting boolean will be **True**. Otherwise it will be **False**.

`or` truth table

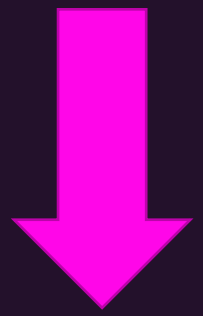
	`True`	`False`
`True`	`True`	`True`
`False`	`True`	`False`

You read a truth table like a multiplication table. Start with a finger on one column label and one row label, per each side of the operator, and trace your way in.

The **not** operator

- The **not** keyword is a unary boolean operator.

```
not [boolean a]
```



```
boolean value
```

- The expression following the **not** operator will evaluate to the opposite boolean value. True becomes False and False becomes True.

not truth table

	True	False
not	False	True

Logical Operator Reference

and

Expression	Evaluates to
`True and True`	`True`
`True and False`	`False`
`False and True`	`False`
`False and False`	`False`

or

Expression	Evaluates to
`True or True`	`True`
`True or False`	`True`
`False or True`	`True`
`False or False`	`False`

not

Expression	Evaluates to
`not True`	`False`
`not False`	`True`

It is worth committing these to memory. Every programming language (including Excel) shares the same ideas of logical operators.