

# ECS15



boolean

# Boolean expressions

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- Have value **True** or **False**

- Examples:

answer == "b"

x < 30

2+2 == 4

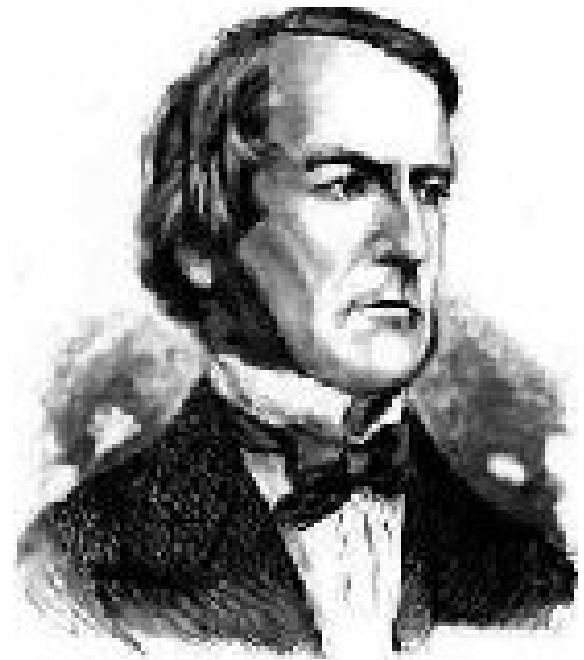
2+2 == 5

"cat" != "Cat"

# Boolean algebra

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- Named after George Boole (1815-1864)
- Main idea: you can write down logic as mathematical formulas, as well as in sentences.
- Logic as a computational system. Python does some of this computation!



# And

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- True if both are true
- True **and** True == True
- False **and** True == False
- False **and** False == False

# Or

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- True if one or the other is true
- True **or** True == True
- True **or** False == True
- False **or** True == True
- False **or** False == False

# Not

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- `not True == False`
- `not False == True`

# Operators

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- and, or and not are **Boolean operators**
- Addition is a **numeric operator**  
**2+2**
- Concatenation is a **string operator**  
**"drive" + "way"**

# In if statements

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- `if` `reply != "a"` `and` `reply != "b"`:  
    `print` "Please answer a or b"
- `if` `reply == "a"` `or` `reply == "b"`:  
    `print` "Thank you!"

# Rock, scissors, paper

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- Play the game with your neighbor.

# More than two cases...

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- ❑ Need to do something if rock, something else if scissors, and something else if paper..
- ❑ `if...elif...else`
- ❑ `if...elif...elif...elif...else`

# Blocks

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- ❑ A block is a group of lines, all with the same indentation.
- ❑ Blocks can be nested inside of other blocks

```
if not (user == "r" or user == "s" or user == "p"):
    print "Not an allowed choice!"
```

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```
else:
```

```
# Choose a random number between 1 and 2
number = random.randint(1,3)
```

```
# Random number determines the program's choice
if number == 1:
```

```
    program = "r" # 1 means rock
```

```
elif number == 2:
```

```
    program = "s" # 2 means scissors
```

```
else: # number == 3:
```

```
    program = "p" # 3 means paper
```

# if...elif...else

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if x == 1:

# only done when x == 1

elif x < 3:

# only done when x != 1 and x < 3

elif x != 5:

# only done when x != 1 and x >= 3 and  
x != 5

else:

# done when x == 5

# Next time

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- How to decide who won rock, paper, scissors?