# CSCI 127: Joy and Beauty of Data

Lecture 5: Selection & If Statements

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https://reesep.github.io/classes/127/main.html

#### Announcements

Lab 2 due TONIGHT @ 11:59 PM

Program 1 posted (Due 12/9) @ 11:59 PM

-> Will need to understand iteration (Monday) to complete it

Lab 3 due on Monday @ 11:59 PM

-> will try to have it posted tonight or Saturday morning

## Today

Booleans, If statements



## Booleans

**Boolean** is a data type for storing true and false and values

There are only 2 values: True and False

## **Boolean Comparison**

x == y

# x is equal to y

4 == 4 -> True

x != y

# x is not equal to y

3 != 4

->True

x > y

# x is greater than y

10 > 3

->True

x < y

# x is less than y

4 < 1

-> False

x >= Y

# x is greater than or equal to y

2 >= 3

-> False

x <= Y

# x is less than or equal to y

3 <= 3

-> True

## **Logical Operators**

## and

Both conditions must be True

$$x = 5$$
  
 $y = 4$ 

$$print(x==5 and y==0)$$

$$\mathbf{x} = 5$$

$$y = 4$$

$$print(x==5 and y==4)$$

**False** 

**True** 

## **Logical Operators**

#### or

One of the conditions must be True (or Both of the conditions must be True)

$$x = 5$$

$$print(x==5 \text{ or } y==0)$$

$$x = 5$$

$$y = 4$$

$$x = 5$$
$$y = 4$$

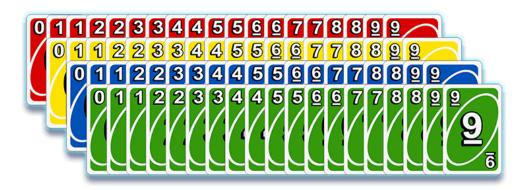
$$print(x==5 \text{ or } y==4)$$

True

**False** 

True

#### **Practice Problems**



#### **Checking a legal move in UNO**

Consider a simplified game of UNO that has forty different cards. Each card has a color ("red", "yellow", "green" or "blue") and a value (0, 1, 2, 3, 4, 5, 6, 7, 8 or 9). Complete the boolean function below so that it returns True if the second card can be played on the first card and False otherwise.

def legal\_play(first\_value, first\_color, second\_value, second\_color):

For example, legal\_play(3, "blue", 3, "green") and legal\_play(5, "yellow", 7, "yellow") should both return True, but legal\_play(9, "red", 6, "green") should return False.

#### **Practice Problems**

#### **Identifying leap years**

The following criteria is used to determine whether a year is a leap year:

The year is evenly divisible by 4; If the year can be evenly divided by 100, it is NOT a leap year, unless; The year is also evenly divisible by 400. Then it is a leap year.

Write a function that takes a year as a parameter and returns True if the year is a leap year, False otherwise.