190F Foundations of Data Science

Spring 2020

Lecture 7

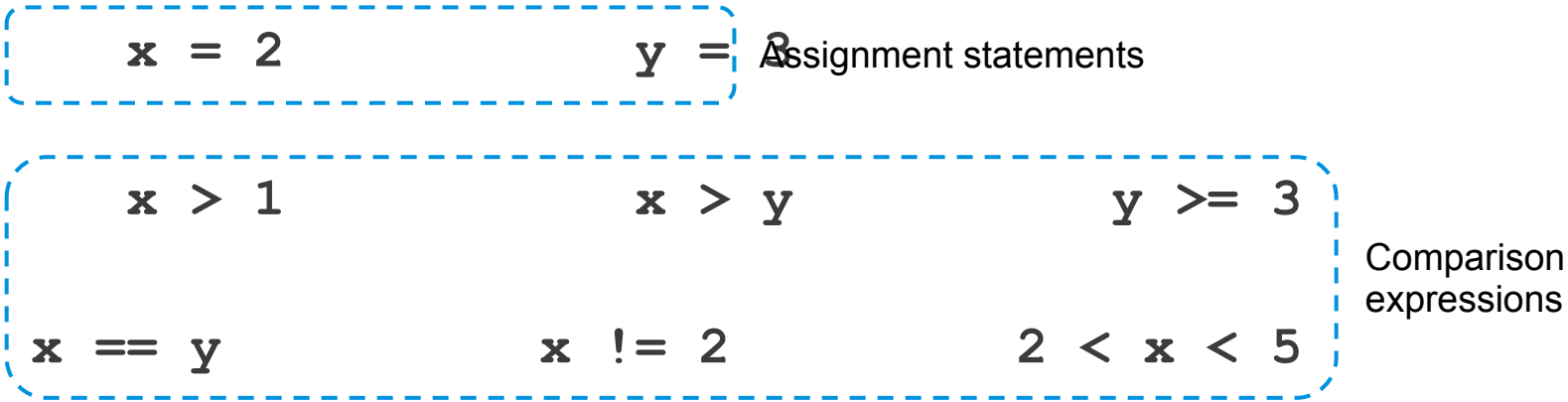
Iteration and Random Selection

Announcements

Comparison

Comparison Operators

The result of a comparison expression is a **`bool`** value



(Demo)

Combining Comparisons

Boolean operators can be applied to **`bool`** values

```
a = True      b = False
```

Evaluate to True

```
not b          a or b          a and not b
```

```
a and b      not (a or b)      b and b
```

Evaluate to False

(Demo)

Aggregating Comparisons

Summing an array or list of bool values will count the True values only.

```
1     + 0      + 1             == 2
True + False + True           == 2
sum([1    , 0     , 1    ))   == 2
sum([True, False, True))      == 2
```

(Demo)

Random Selection

Random Selection

`np.random.choice`

- Selects at random
- with replacement
- from an array
- a specified number of times

```
np.random.choice(some_array, sample_size)
```

(Demo)

Discussion Question

```
d = np.arange(6) + 1
```

What results from evaluating the following 2 expressions? Are they the same? Do they describe the same process?

```
np.random.choice(d, 1000) + np.random.choice(d, 1000)
```

```
2 * np.random.choice(d, 1000)
```

The Print Function

(Demo)

Control Statements

Control Statements

These statements *control* the sequence of computations that are performed in a program

- The keywords `if` and `for` begin control statements
- The purpose of `if` is to define functions that choose different behavior based on their arguments
- The purpose of `for` is to perform a computation for every element in a list or array

(Demo)