Computation and Visualization for Analytics

Spring 2021

Week 1.2

- Data structure
- Data type

Data Structure and Data Types

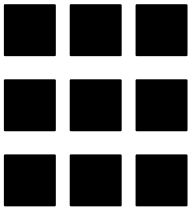
Single value variables

```
age=23
name= “Northeastern University”
date=02/15/2020
attendance=True
```

Vectors (1D array)

```
age=23, 25, 32, 21, 20
name= “Neu”, “MIT”, “Harvard”
date=02/15/2020, 02/16/2020
attendance=True, False, True
```

Data Structure and Data Types



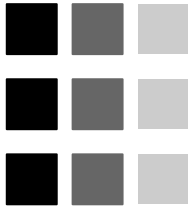
Matrix (2D array)

1.1	3.0
1.2	4.3

True	False
False	True

A	C
B	D

02/10/2019	04/10/2019
05/10/2019	03/10/2019



Dataframes

State	Date	Income	Expenditure
MA	02/10/2019	50000	10000
NH	02/10/2019	45000	8000
MA	01/20/2020	48000	9100
MA	02/10/2019	50500	11000
NH	02/10/2019	42000	7000
MA	02/10/2019	49000	8300
NH	02/10/2019	44000	6800

Single value variables

```
x = 1, y = 2, z = 3.6
```

Arithmetic Operations

```
x+y
x-y
x/y
x*y
x^y
```

Logical Operations

```
x==y
x!y
x>y
x<y
x>=y
x<=y
```

Functions

```
sin(x)
cos(y)
log(x)
round(z)
```

Vectors

```
x = 1, 2, 4, 5
y = 2, 8, 6, 7
```

- Add/remove elements
- Access/subset elements

Arithmetic Operations

```
x+y
x-y
x/y
x*y
x^y
```

Logical Operations

```
x==y
x!y
x>y
x<y
x>=y
x<=y
```

Functions

```
sin(x)
cos(y)
log(x)
sum(x)
mean(y)
max(y)
```

Matrix

1.1	3.0
1.2	4.3

x

1.1	3.0
1.2	4.3

y

- Add/remove elements
- Access/subset elements

Arithmetic Operations

```
x+y
x-y
x/y
x*y
x^y
```

Logical Operations

```
x==y
x!y
x>y
x<y
x>=y
x<=y
```

Functions

```
sin(x)
cos(y)
log(x)
sum(x)
mean(y)
max(y)
```