Python Programming Basics

Numeric Functions and Operators in Python

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General Functions

Note: ‘x’ here is a numeral or a vector of numerals.

```
#Absolute value of ‘x’
abs(-4)
4
x = [-4,4.5,-10.5,6]
[abs(i) for i in x]
[4, 4.5, 10.5, 6]`
```

```
#Square Root of ‘x’
import math
math.sqrt(81)
9.0
```

```
#Rounds to the nearest integer that’s larger than x
math.ceil(445.67)
446
```

```
#Rounds to the nearest integer that’s smaller than x
math.floor(445.67)
445
```

General Functions

Note: ‘x’ here is a numeral or a vector of numerals.

```
#Rounds to the nearest integer toward 0.
math.trunc(445.67)
445
```

```
#Rounds to the nearest possible value after mentioning how many digits
#to keep after decimal point.
```

```
round(44.5682,2)
44.57
```

General Functions

Note: ‘x’ here is a numeral or a vector of numerals.

```
#Computes natural logarithms.
import numpy as np
np.log(50)
3.912023005428146
np.log([44,55])
array([3.78418963, 4.00733319])
```

```
math.log(50)
3.912023005428146
```

Natural log can be calculated using **numpy** as well as **math** library.

```
#Computes binary (base 2) logarithm.
math.log(8,2)
3.0
```

```
#Computes logarithm to the base 10.
math.log10(55)
1.7403626894942439
```

```
#Computes the exponential value , ex.
math.exp(6)
403.4287934927351
```

Operators

- Assignment Operators
- Arithmetic Operators
- Relational Operators
- Miscellaneous Operators

Arithmetic Operators

```
x = 7
y = 18
```

```
#Addition
x+y
25
```

```
#Subtraction
x-y
-11
```

```
#Multiplication
x*y
126
```

Arithmetic Operators

```
#Division
y/x
2.5714285714285716
```

```
#Exponentiation
y**x
612220032
```

```
#Integer Division to get Remainder
y%x
4
```

```
#Integer Division to get Quotient
y//x
2
```

Relational Operators

These operators are used to compare values. The result of the comparison is the Boolean (True or False) value. Following table shows the relational operators available in Python

```
x = 7
y = 18
```

```
#Less than
x<y
True
```

```
#Greater than
x>y
False
```

```
#Less than or equal to
x<=5
False
```

Relational Operators

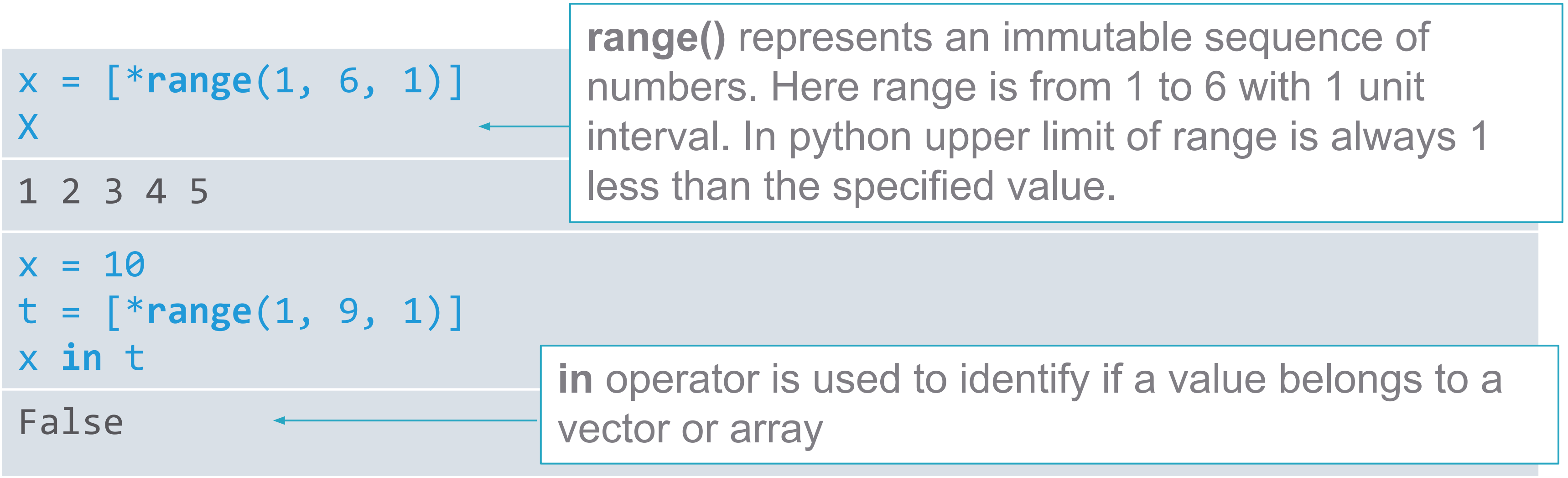
```
#Greater than or equal to
y>=20
False
```

```
#Equal to
y==16
False
```

```
#Not equal to
x!=5
True
```

Miscellaneous Operators

These operators are used for specific purpose and not general mathematical operations.



```
x = [*range(1, 6, 1)]
X
```

```
1 2 3 4 5
```

range() represents an immutable sequence of numbers. Here range is from 1 to 6 with 1 unit interval. In python upper limit of range is always 1 less than the specified value.

```
x = 10
t = [*range(1, 9, 1)]
x in t
```

```
False
```

in operator is used to identify if a value belongs to a vector or array

Quick Recap

In this session, we learnt different types of Functions and Operators in Python. Here is a quick recap:

General Functions	• `abs(), sqrt() ceil(), floor(), trunc(), log(), log2(), log10(), exp()`
Operators	• Assignment Operators: `=` • Arithmetic Operators: `+, -, *, /, ^, %, //` • Relational Operators: `<, >, <=, >=, ==, !=` • Miscellaneous Operators: `in`