SDEV140 - Introduction to Software Development

More Numeric Operations in Python

In addition to the basic mathematical operators, python allows use to use bitwise and augmented assignment operators. Bitwise operators perform bitwise math, while augmented assignment operators allow us to perform a mathematical operation in the same statement that we assign a value to a variable.

Bitwise Operators

Operator	Description	Notes
x & y	Bitwise AND	
x	y	Bitwise OR
x ^ y	Bitwise XOR	
~x	Bitwise NOT	
x « y	Left Shift	Multiplies x by 2**y
x » y	Right Shift	Divides x by 2**y

Augmented Assignment Operators

Operator	Description
x += y	Add and Assign
x -= y	Subtraction and Assign
x *= y	Multiply and Assign
x /= y	Divide and Assign
x //= y	Integer Divide and Assign
x %= y	Modulo and Assign
x **= y	Power and Assign

Additional Precision and Math Libraries

Python has a vast library of additional libraries both official and developed by the community for working with numeric data. The first examples gives us high precision decimal arithmetic as well as rational fraction arithmetic.

```
from decimal import Decimal
from fractions import Fraction

>>> Decimal('0.1') + Decimal('0.2')
Decimal('0.3')

>>> Fraction(1, 3) + Fraction(1, 3)
Fraction(2, 3)
```

Importing the math library provides access to mathematical operations beyond simple arithmetic.

```
import math
>>> math.sqrt(16)
4.0

>>> math.sin(math.pi/2)
1.0

>>>math.log(100, 10)
2.0
```