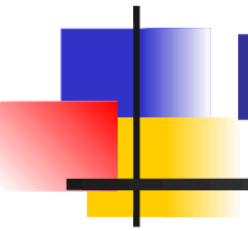
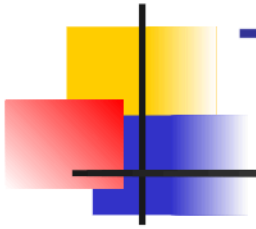


Python Arithmetic

ICS-110P

Michael Bauer

Leeward Community College

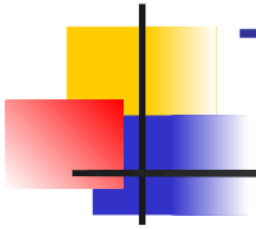


The Assignment Operator

- The assignment operator is an equals sign (=). It is used to assign a value to a variable.
- The left side must be a variable or constant.
- The right side must be an expression that either evaluates to or can be converted to a value of the variable's data type.

  varName = expression
- For example:

  inches = feet * 12

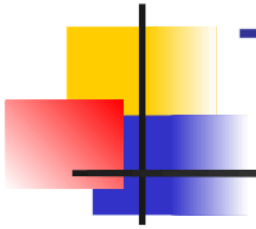


The Assignment Operator

- For example:

  inches = feet * 12

  inches = feet * INCHES_PER_FOOT



The Assignment Operator

- Integer results are provided only when both operands are integers.
- Real results are provided when one or both operands are real numbers.
- Exception: Division (/) always produces a real result.

Arithmetic Operators

- The following arithmetic operators are used to form expressions:

Operator	Operation
+	Addition
-	Subtraction
*	Multiplication
/	Division
//	Floor Division
%	Modulus
**	Exponentiation

Arithmetic Expressions

Values stored: a = 5, b = 12, D = 10

c = a + b; #c is assigned the value 17.

c = a * 3; #c is assigned the value 15.

c = D – a; #c is assigned the value 5.

Arithmetic Expressions

Values stored: a = 5.0, b = 2

```
c = a / b;     #c is assigned 2.5.

d = 5 // b;  #d is assigned 2.

c = 5 / b;     #c is assigned 2.5.
```

Arithmetic Expressions

- The floor division operator (//) returns the quotient and modulus operator (%) returns the remainder of a division operation.

  Values stored: a = 14, b = 5

  c = a // b;   #c is assigned 2.

  c = a % b;   #c is assigned 4.

  14 / 5 = 2 remainder 4

Arithmetic Expressions

- Standard order of operations (left to right):
  - First: Exponentiation (**)
  - Second: Multiplication, Division & Modulus (*, /, //, %)
  - Third: Addition & subtraction (+, -)
- Parenthesis may be used to clarify or change the standard order of operations.

Arithmetic Expressions

Values stored: a = 5, b = 12, c = 2.5

d = b – a / c;

1. a/c is evaluated, giving the result 2.0
2. b - 2.0 is evaluated, giving the result 10.0
3. 10.0 is assigned to d.

Arithmetic Expressions

- The variable which is assigned the result of an operation may be an operand in the expression.

  Value stored: a = 5

  a = a * 2   #assigns 10 to a
- Python shorthand for the above:

  a *= 2
- The Python shorthand works for all operators.

Arithmetic Expressions

- The shorthand notation works with longer expressions:
  Values stored: a = 5, b = 12

```
a = a + b / 2        #a is assigned 11.0
a += b / 2           #a is assigned 11.0

a = a + b // 2       #a is assigned 11
a += b // 2  #a is assigned 11

a = a / (b + 2)     #a is assigned 0.35....
a /= b + 2           #a is assigned 0.35....
```