

[301] Variables and Expressions

Tyler Caraza-Harter

Learning Objectives

Variables:

- Purpose
- Naming

Assignment:

- Syntax
- Reassignment

Types of errors:

- syntax, runtime, semantic

Documentation:

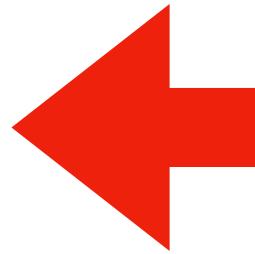
- comments

Please read Chapter 2

Today's Outline

Review

- Operator Precedence



Expressions, Variables, and Assignments

Demos

Bugs 

Demos

Naming variables

Demos

Unordered

What is it?	Python Operator
comparison	==, !=, <, <=, >, >=
signs	+X, -X
AND	and
add/subtract	+, -
exponents	**
NOT	not
OR	or
multiply/divide	*, /, //, %

Ordered by Precedence

What is it?	Python Operator

simplify first

simplify last

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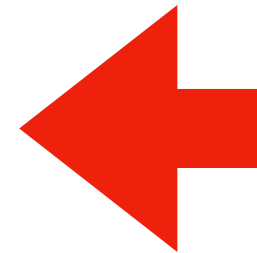
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Expressions

Expressions are a mix of operators and operands. For example:

$5 + 5$

$(8/2) ** 2 * 3.14$

$3 * 3 > 4 + 4$

$3 \% 2 == 0$ or $3 \% 2 == 1$

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How do variables get associated with a value?

Assignment

An **assignment** computes an expression (maybe a simple one) and puts the result in a variable:

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```
total = x + y
```

```
area = (diameter/2) ** 2 * pi
```

```
is_bigger = value1 * value1 > value2 + value2
```

```
is_even_or_odd = num % 2 == 0 or num % 2 == 1
```

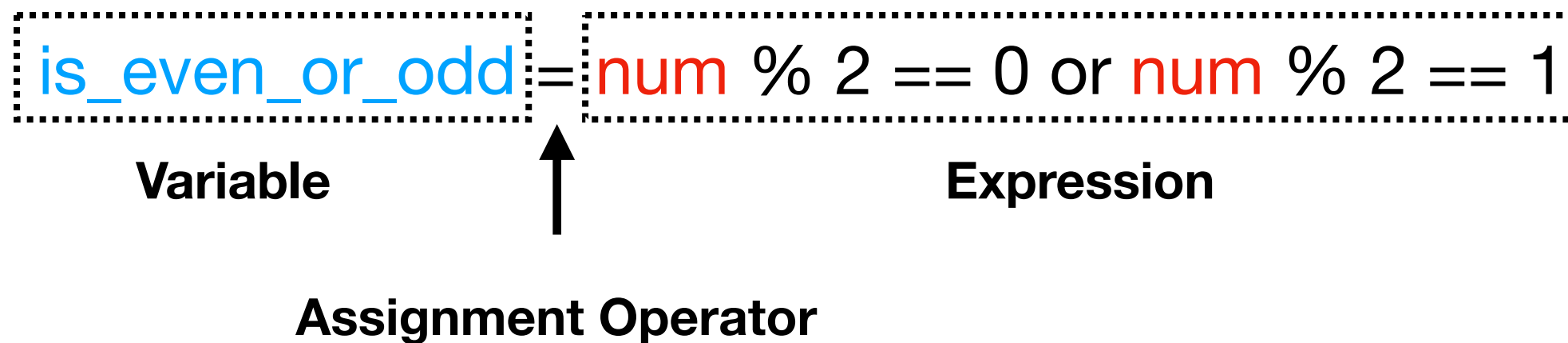
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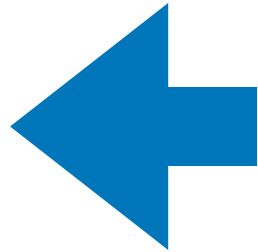


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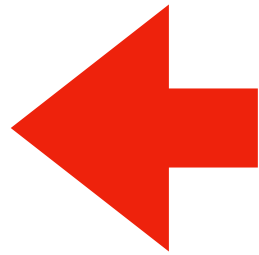
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Categories of Errors

Syntax Error

- What you typed never makes sense in any context, so Python doesn't run
- `5 = x`

Runtime Error

- What you typed looks like it could make sense, but when you get to running it, it actually doesn't work
- Appears with different names (TypeError, ZeroDivisionError, etc)
- `x = 5 / 0`

Semantic Error

- What you did actually runs, but produces the wrong answer
- `square_area = square_side * 2`

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Which kind of bugs do you think scare programmers the most?

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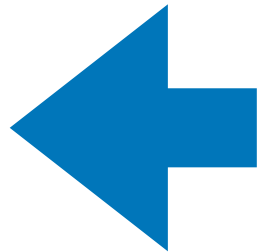
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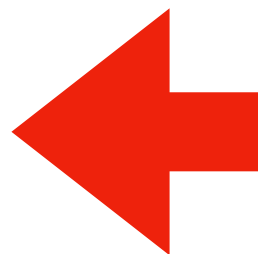
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Python Naming Rules

Variable naming rules have actually become fairly complex:

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- Don't start with a number
- Don't use Python keywords (e.g., "and")

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GOOD:

cs301
CS301
cs_301
_cs301

BAD:

301class
and
pi3.14
x!

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