

Variables, Expressions, and Statements

Chapter 2



Python for Everybody www.py4e.com





Constants

- Fixed values such as numbers, letters, and strings, are called "constants" because their value does not change
- Numeric constants are as you expect
- String constants use single quotes (') or double quotes (")

```
>>> print(123)
123
>>> print(98.6)
98.6
>>> print('Hello world')
Hello world
```



Reserved Words

You cannot use reserved words as variable names / identifiers

False
None
True
and
as
assert
async

await
break
class
continue
def
del
elif

else
except
finally
for
from
global
if

import
in
is
lambda
nonlocal
not
or

pass raise return try while with yield



Variables

- A variable is a named place in the memory where a programmer can store data and later retrieve the data using the variable "name"
- Programmers get to choose the names of the variables
- You can change the contents of a variable in a later statement

```
x = 12.2

y = 14

x = 100

x = 14
```



Python Variable Name Rules

Must start with a letter or underscore _ Must consist of letters, numbers, and underscores Case Sensitive

Good: spam eggs spam23 speed

Bad: 23spam #sign var.12

Different: spam Spam SPAM



Sentences or Lines

x = 2

Assignment statement

x = x + 2

Assignment with expression

print(x)

Print function

Variable (e.g., x)

Operator (e.g., = +)

Constant Function (e.g., 2)

(e.g., print ())



Mnemonic Variable Names

- Since we programmers are given a choice in how we choose our variable names, there is a bit of "best practice"
- We name variables to help us remember what we intend to store in them ("mnemonic" = "memory aid")
- This can confuse beginning students because well-named variables often "sound" so good that they must be keywords



What are these bits of code doing?

```
hours = 35.0
rate = 12.50
pay = hours * rate
print(pay)
```



Assignment Statements

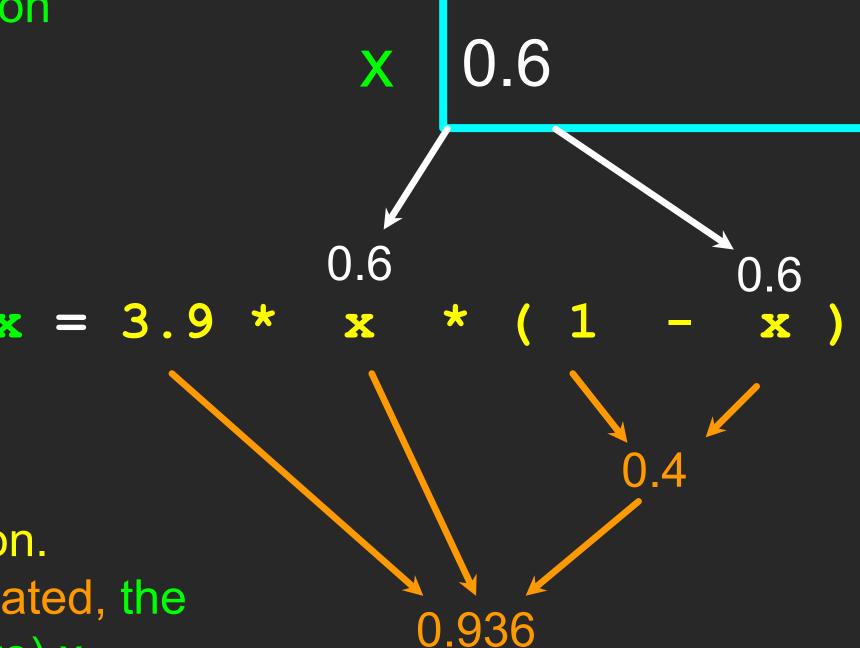
We assign a value to a variable using the assignment statement (=)

An assignment statement consists of an expression on the right-hand side and a variable to store the result

$$x = 3.9 * x * (1 - x)$$



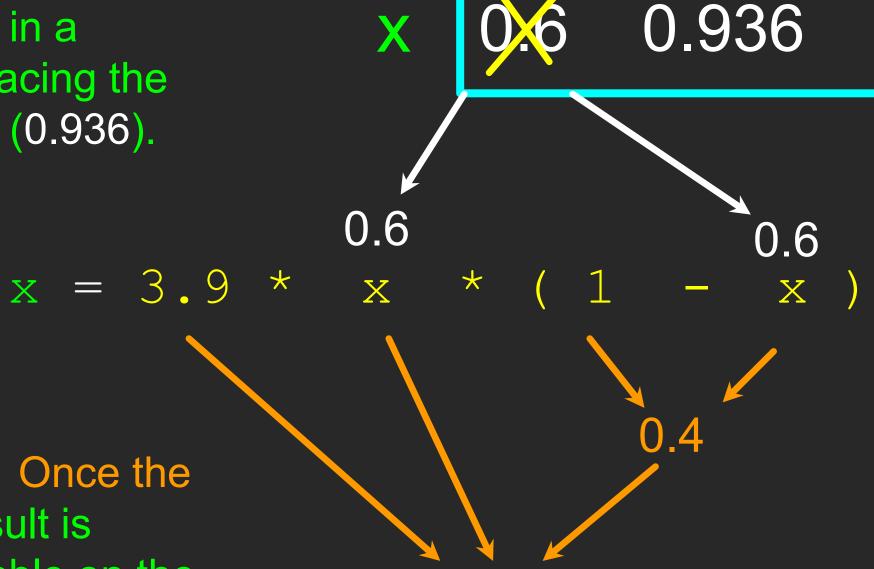
A variable is a memory location used to store a value (0.6)



The right side is an expression.

Once the expression is evaluated, the result is placed in (assigned to) x.

A variable is a memory location used to store a value. The value stored in a variable can be updated by replacing the old value (0.6) with a new value (0.936).



0.936

The right side is an expression. Once the expression is evaluated, the result is placed in (assigned to) the variable on the left side (i.e., x).

Expressions