

# Variables, Expressions, and Statements

## Chapter 2



Python for Everybody  
[www.py4e.com](http://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	await	else	import	pass
None	break	except	in	raise
True	class	finally	is	return
and	continue	for	lambda	try
as	def	from	nonlocal	while
assert	del	global	not	with
async	elif	if	or	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**

~~12.2~~ 100

**y**

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**

(e.g., 2)

**Function**

(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

<http://en.wikipedia.org/wiki/Mnemonic>

```
x1q3z9ocd = 35.0
x1q3z9afd = 12.50
x1q3p9afd = x1q3z9ocd * x1q3z9afd
print(x1q3p9afd)
```

```
a = 35.0
b = 12.50
c = a * b
print(c)
```

What are these  
bits of code  
doing?

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



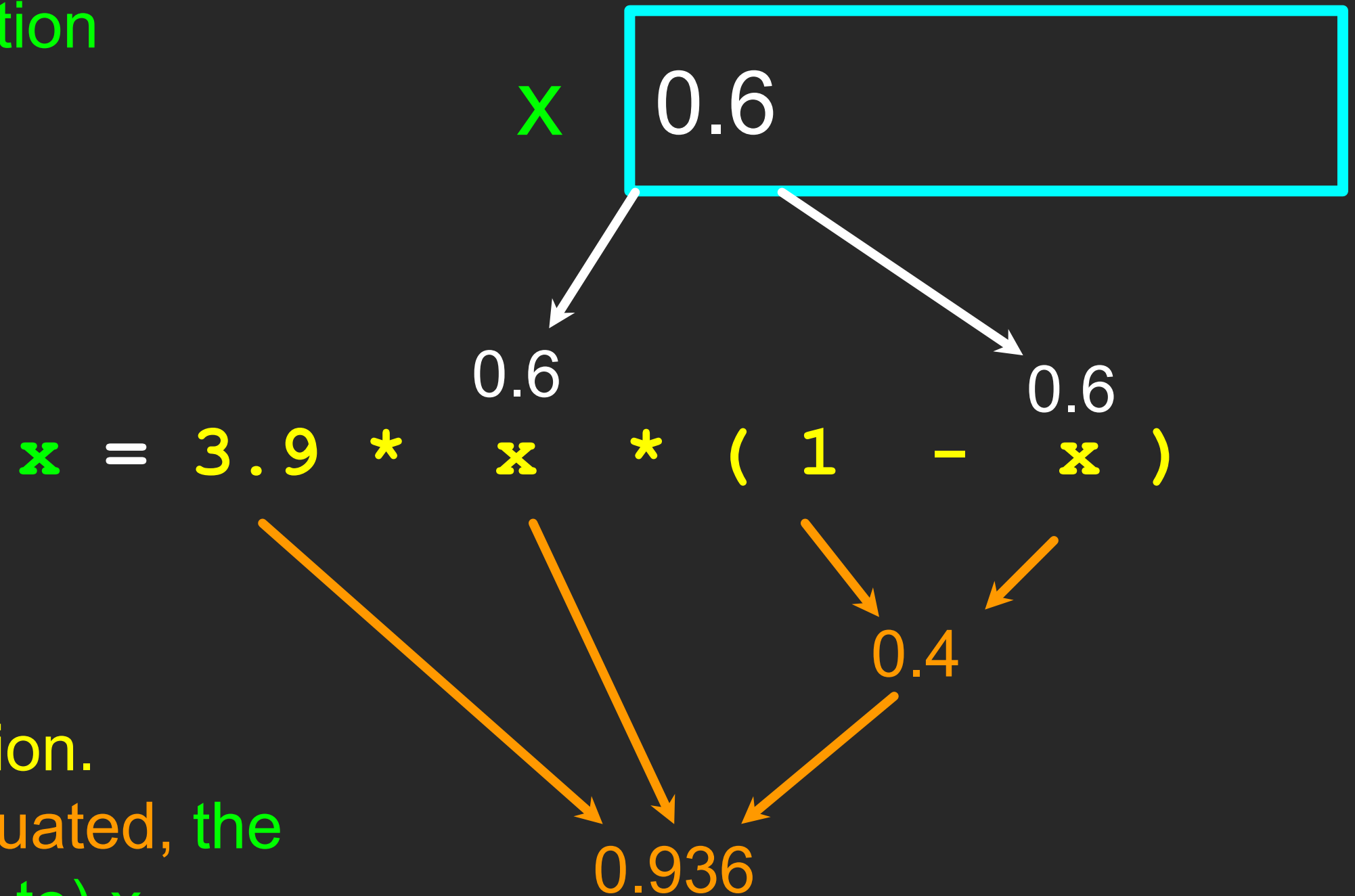
# Assignment Statements

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

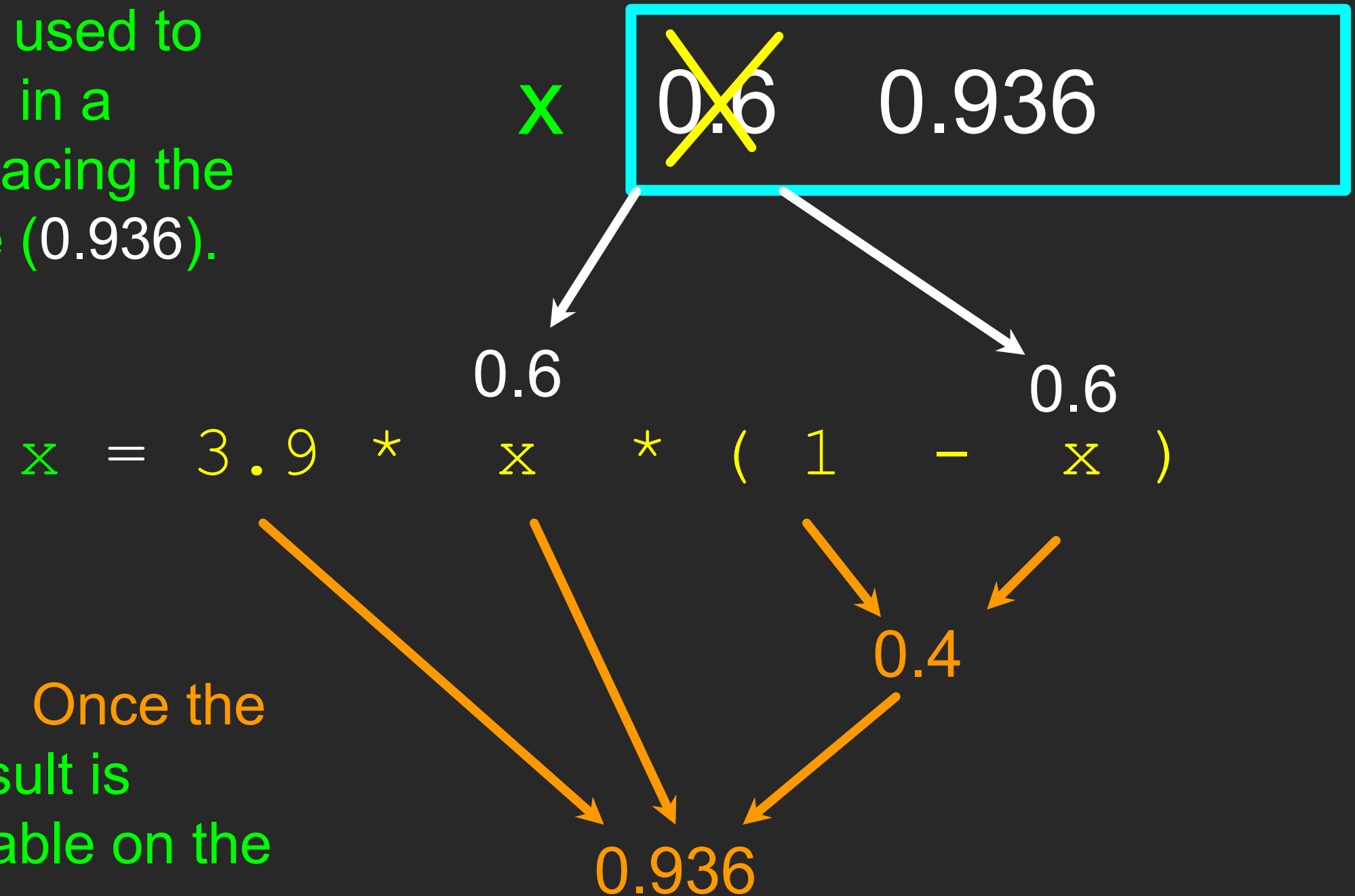
```
x = 3.9 * x * ( 1 - x )
```

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).



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