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

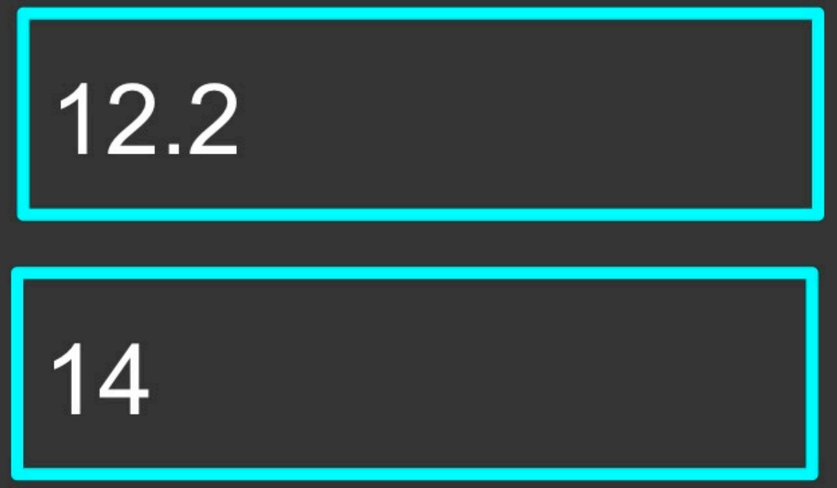
- You cannot use reserved words as variable names / identifiers

```
False   class   return  is      finally
None    if      for     lambda  continue
True    def     from    while   nonlocal
and     del     global  not     with
as      elif    try     or      yield
assert  else    import  pass
break   except  in      raise
```

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

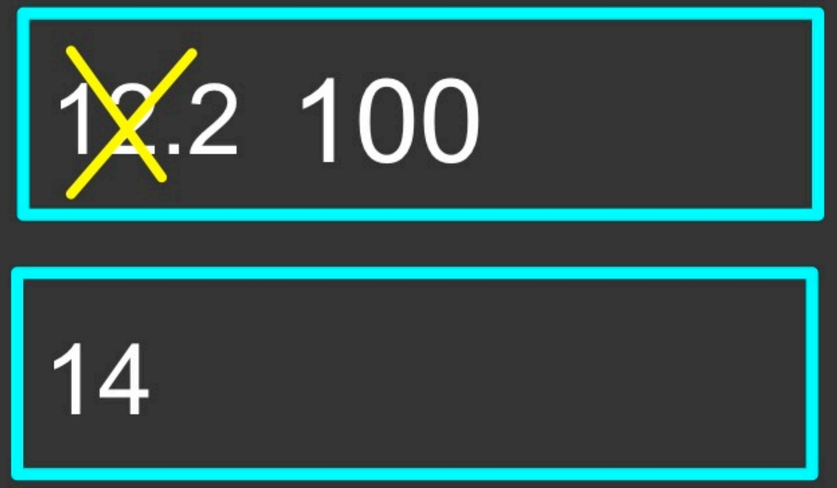
```
x = 12.2
y = 14
```



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
```



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
x = x + 2
print(x)
```

Assignment statement

Assignment with expression

Print statement

Variable

Operator

Constant

Function

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)
```

What is this bit of code doing?

```
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?

```
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)
```

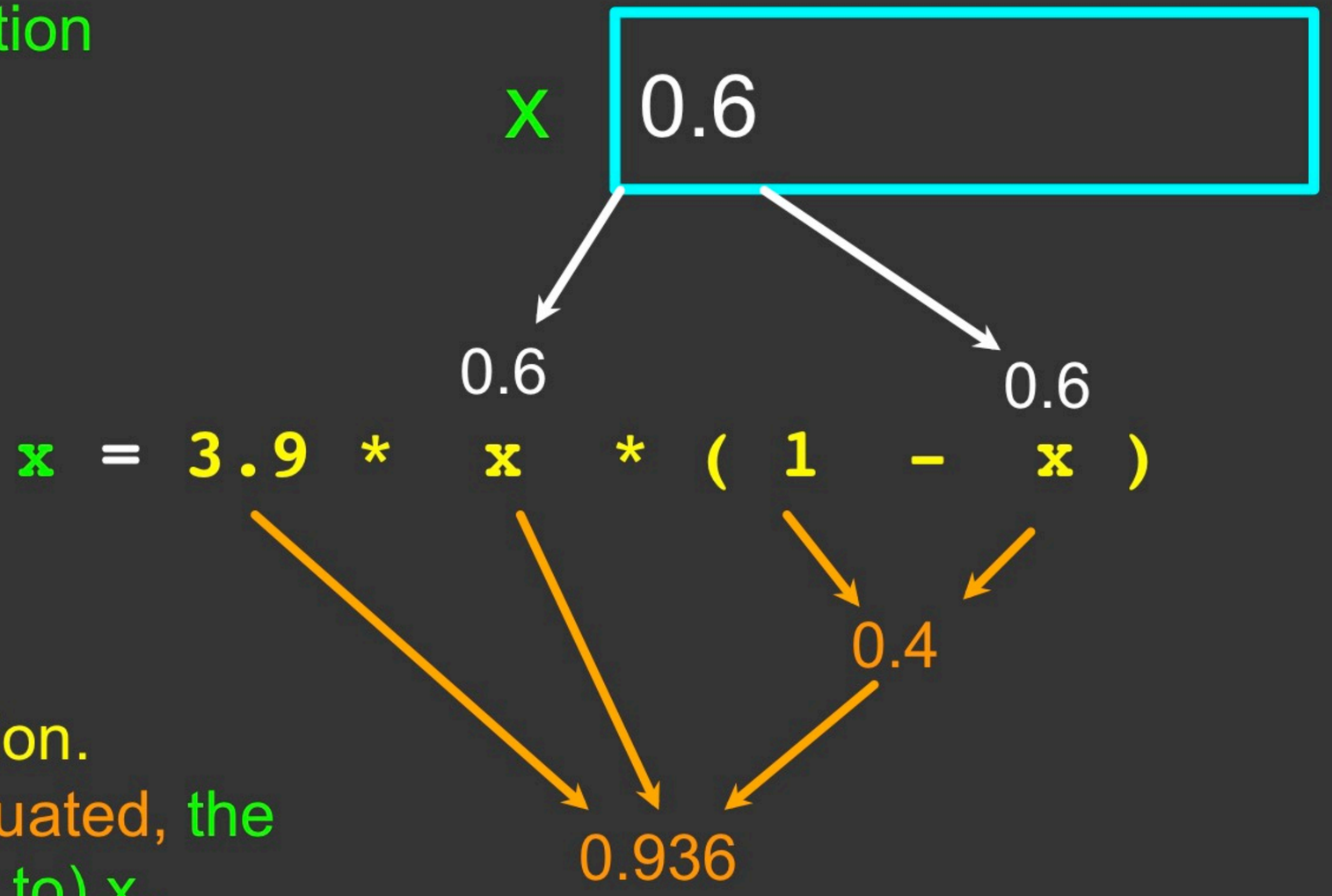
Assignment Statements

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

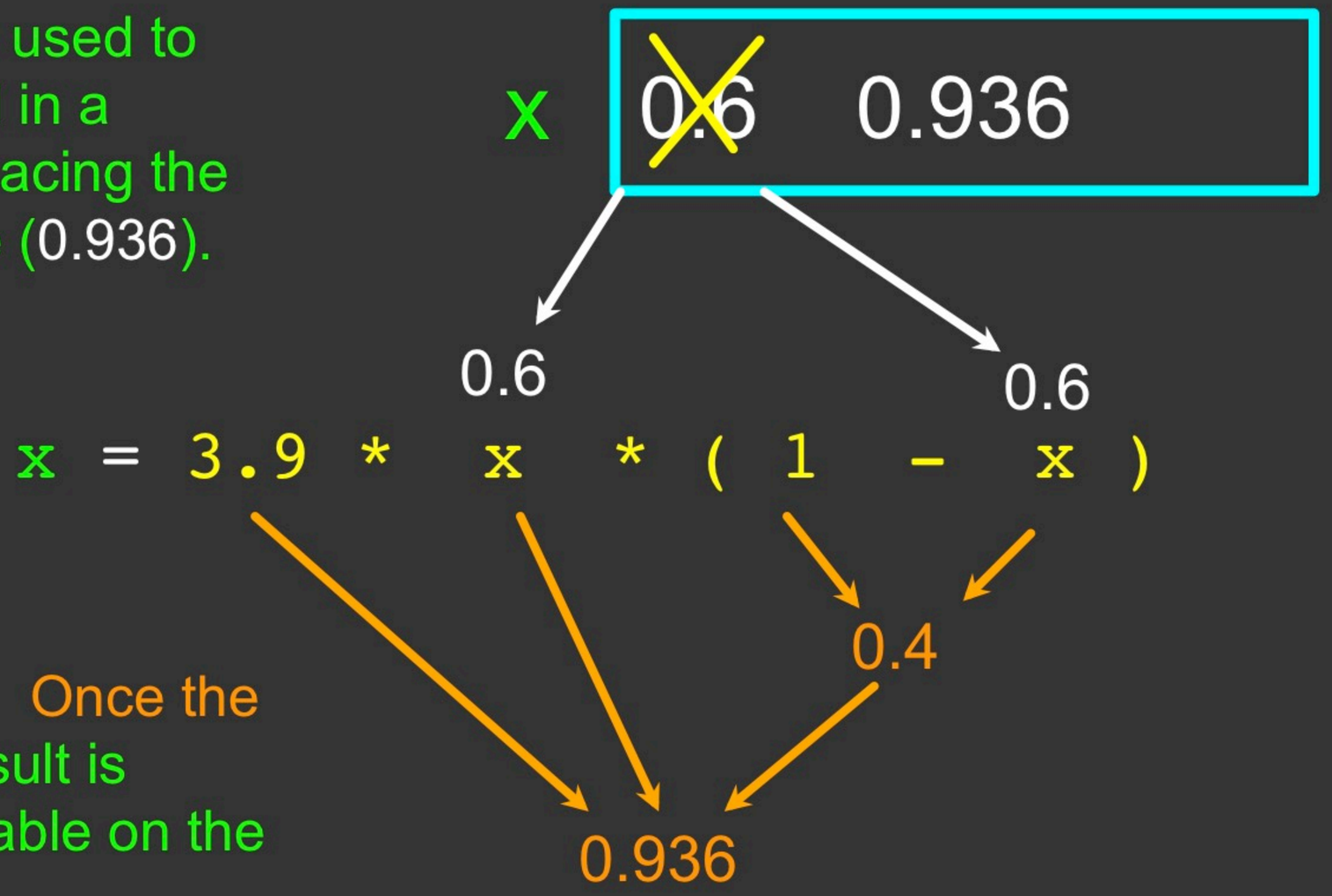
```
x = 3.9 * x * ( 1 - x )
```

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).