

Ling 555 — Programming for Linguists

Python - instant hacking

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Outline

algorithms

1 Algorithms

numbers

2 numbers

variables

3 variables

statements

4 statements

input

5 input

functions

6 functions

modules

7 modules

scripts

8 scripts

strings

9 strings

- more strings

Algorithms

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

What is an algorithm?

Algorithms

algorithms

What is an algorithm?

numbers

Definition

variables

An algorithm is a set of instructions or a recipe for a computer to carry out.

statements

input

functions

modules

scripts

strings

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

Division

By default, $1 / 2$ yields 0 in python. This is integer division.

Solution: `from __future__ import division`

Variables

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

What is a variable?

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

Variables

What is a variable?

Definition

A variable is a name that refers to some value (could be a number, a string, a list etc.)

Practice

- 1 Store the value 42 in a variable named *foo*

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

Variables

What is a variable?

Definition

A variable is a name that refers to some value (could be a number, a string, a list etc.)

Practice

- 1 Store the value 42 in a variable named *foo*
 $\text{foo} = 42$
- 2 Store the value of $\text{foo} + 10$ in a variable named *bar*

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

Variables

What is a variable?

Definition

A variable is a name that refers to some value (could be a number, a string, a list etc.)

Practice

- 1 Store the value 42 in a variable named *foo*
`foo = 42`
- 2 Store the value of `foo+10` in a variable named `bar`
`bar = foo + 10`

Statements

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

What is the difference between an expression and a statement?

Statements

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

What is the difference between an expression and a statement?

Definition

An expression *is* something, and a statement *does* something.

User input

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

Practice

- 1 Ask the user to input a number, and store it as the variable *foo*

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

User input

Practice

- 1 Ask the user to input a number, and store it as the variable *foo*
`foo = input("enter a number: ")`
- 2 What is the value of *foo* now?

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

User input

Practice

- 1 Ask the user to input a number, and store it as the variable *foo*
`foo = input("enter a number: ")`
- 2 What is the value of *foo* now?
- 3 Add *foo* and *bar* together

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

User input

Practice

- 1 Ask the user to input a number, and store it as the variable *foo*
`foo = input("enter a number: ")`
- 2 What is the value of *foo* now?
- 3 Add *foo* and *bar* together
`foo + bar`
- 4 Calculate the average of *foo* and *bar*, and save it as a variable named *avg*

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

User input

Practice

- 1 Ask the user to input a number, and store it as the variable *foo*
`foo = input("enter a number: ")`
- 2 What is the value of *foo* now?
- 3 Add *foo* and *bar* together
`foo + bar`
- 4 Calculate the average of *foo* and *bar*, and save it as a variable named *avg*
`avg = (foo + bar)/2`

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

Functions

What is a function?

Definition

A function is a mini-program. It can take several *arguments*, and *returns* a value.

Modules

algorithms

What is a module?

numbers

Definition

variables

Python is easily *extensible*. Users can easily write programs that extend the basic functionality, and these programs can be used by other programs, by loading them as a *module*

statements

input

functions

Practice

modules

- 1 load the math module

scripts

strings

Modules

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

What is a module?

Definition

Python is easily *extensible*. Users can easily write programs that extend the basic functionality, and these programs can be used by other programs, by loading them as a *module*

Practice

- 1 load the math module
`import math`
- 2 Round 35.4 to the nearest integer

Modules

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

What is a module?

Definition

Python is easily *extensible*. Users can easily write programs that extend the basic functionality, and these programs can be used by other programs, by loading them as a *module*

Practice

- 1 load the math module
`import math`
- 2 Round 35.4 to the nearest integer
`math.round(35.4)`
- 3 Round the quotient of foo and bar down to the nearest integer

Modules

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

What is a module?

Definition

Python is easily *extensible*. Users can easily write programs that extend the basic functionality, and these programs can be used by other programs, by loading them as a *module*

Practice

- 1 load the math module
`import math`
- 2 Round 35.4 to the nearest integer
`math.round(35.4)`
- 3 Round the quotient of foo and bar down to the nearest integer
`math.floor(foo/bar)`

Saving and executing programs

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

Example

Script File: hello.py

```
#!/usr/bin/env python
# this script prints 'hello , world ',
#   to stdout
print "hello , world"
```

Add executable permission:

```
chmod a+x hello.py
```

Run the program:

```
./hello.py
```

String Basics

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

more strings

- Strings must be enclosed in quotes (double or single)
- Strings can be concatenated using the + operator

More Strings

algorithms

numbers

variables

statements

input

functions

modules

scripts

strings

long Multi-line strings can be created by using triple quotes

raw Special characters do not need to be escaped in raw strings '''

unicode Unicode strings can represent any character in any language

more strings