

This is CS50

Week 6

Today

- Python
 - Strings
 - Loops
 - Dictionaries
- Libraries
- File I/O

Strings

GOODNIGHT MOON



by Margaret Wise Brown
Pictures by Clement Hurd

"In the great green room"



"there was a telephone
and a red balloon"




```
char *text = get_string("...");
```

```
text = input("...")
```

```
if (strcmp(text, "hello") == 0)
{
    ...
}
```

```
if text == "hello":
    ...
```

text[i]

text[i]

Dot Notation

```
text = input("...")
```

" In the great
green room "

```
text = input("...")  
text.strip()
```

" In the great
green room "

```
text = input("...")  
text.strip()
```

"In the great
green room"

```
text = input("...")
```

"IN thE great
green ROom"


```
text = input("...")  
text.lower()
```

"IN thE great
green ROom"

```
text = input("...")  
text.lower()
```

"in the great
green room"

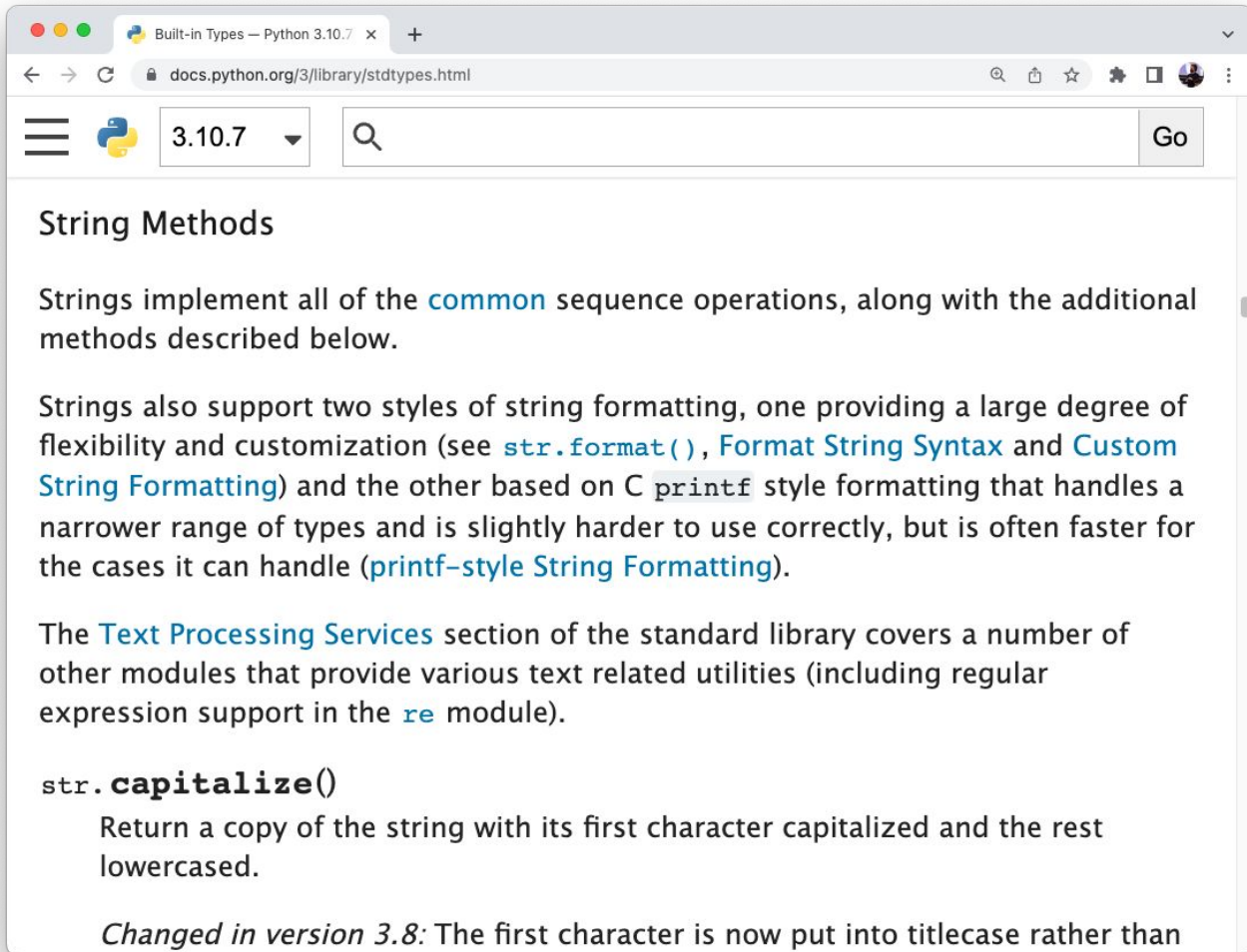
```
text = input("...")  
text.capitalize()
```

"IN thE great
green ROom"

```
text = input("...")  
text.capitalize()
```

"In the great
green room"

str



Built-in Types — Python 3.10.7 x +

docs.python.org/3/library/stdtypes.html

3.10.7

String Methods

Strings implement all of the [common](#) sequence operations, along with the additional methods described below.

Strings also support two styles of string formatting, one providing a large degree of flexibility and customization (see [`str.format\(\)`](#), [Format String Syntax](#) and [Custom String Formatting](#)) and the other based on C `printf` style formatting that handles a narrower range of types and is slightly harder to use correctly, but is often faster for the cases it can handle ([printf-style String Formatting](#)).

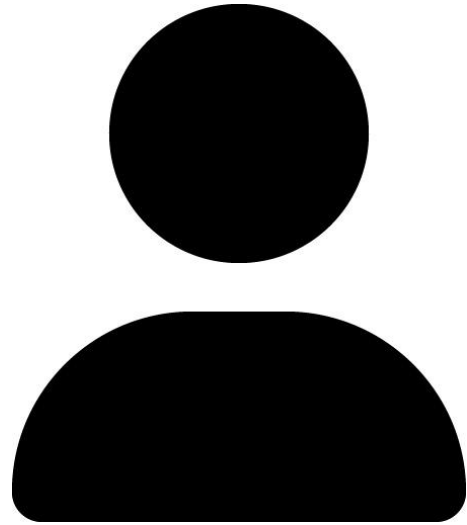
The [Text Processing Services](#) section of the standard library covers a number of other modules that provide various text related utilities (including regular expression support in the [`re`](#) module).

`str.capitalize()`

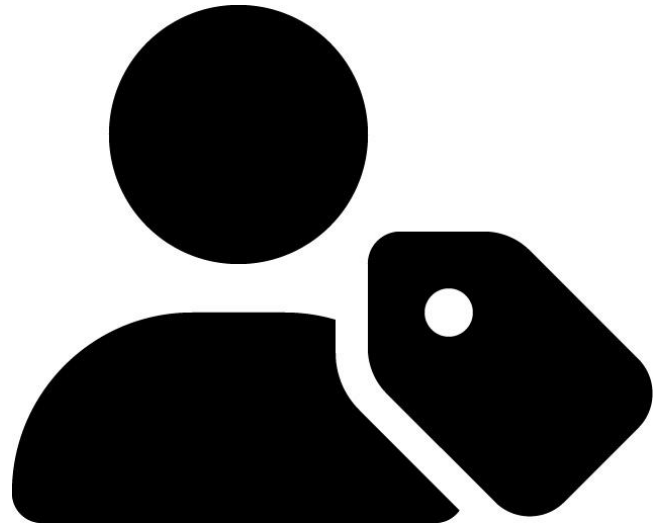
Return a copy of the string with its first character capitalized and the rest lowercased.

Changed in version 3.8: The first character is now put into titlecase rather than

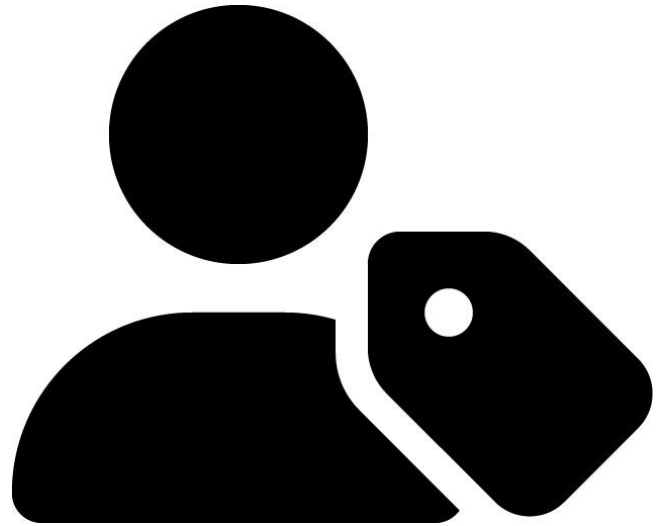
candidate



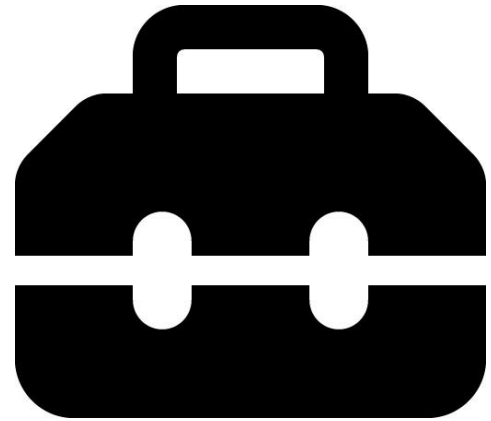
candidate.name



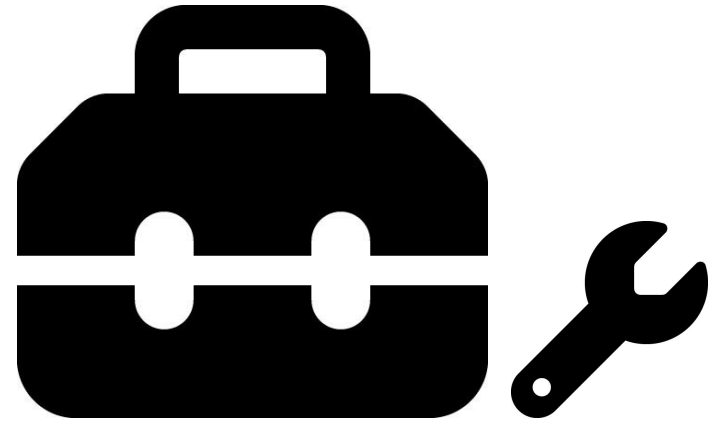
candidate.votes



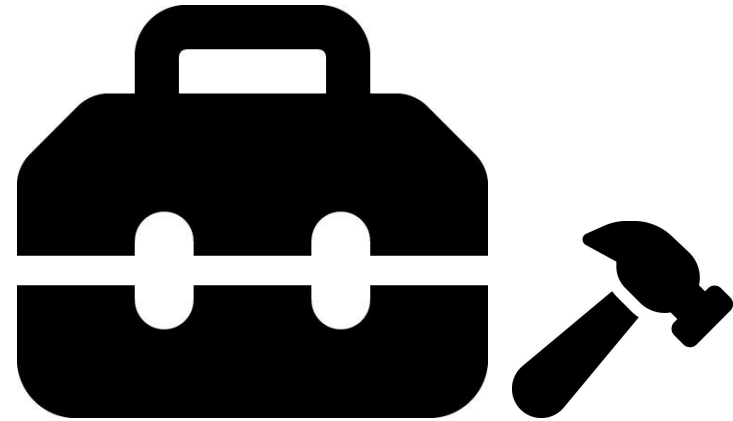
str



```
str.capitalize()
```



`str.lower()`



Loops

```
for c in text:  
    print(c)
```

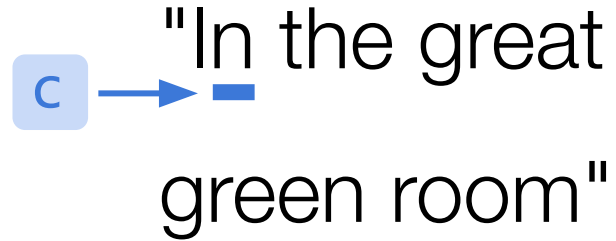
"In the great
green room"

```
for c in text:  
    print(c)
```



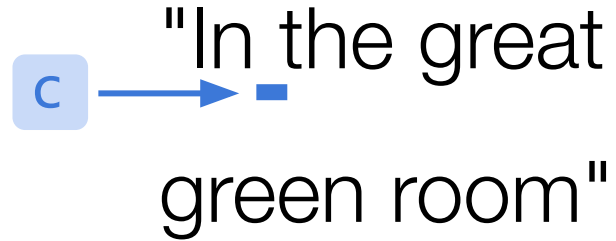
A diagram illustrating the iteration process. A light blue rounded square containing the letter 'c' has a blue arrow pointing to a small blue square. This blue square is positioned under the space character between the words 'great' and 'green' in the string "In the great green room".

```
for c in text:  
    print(c)
```



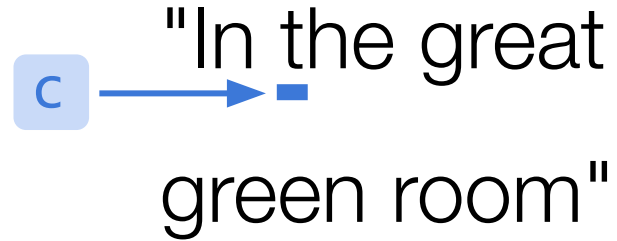
A diagram illustrating the iteration process. A light blue rounded square containing the letter 'c' has a blue arrow pointing to the right. The arrow points to a small blue horizontal bar that is positioned under the letter 'n' in the first line of the string "In the great green room". The string is split across two lines: "In the great" on the top line and "green room" on the bottom line.


```
for c in text:  
    print(c)
```



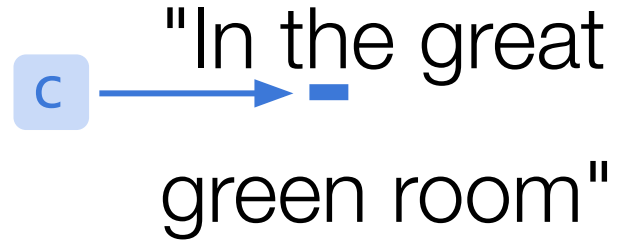
The diagram illustrates the execution of the code. A light blue square containing the letter 'c' has a blue arrow pointing to a small blue square that highlights a space character in the string "In the great green room". The string is split across two lines: "In the great" on the top line and "green room" on the bottom line. The space character is located at the end of the first line.

```
for c in text:  
    print(c)
```



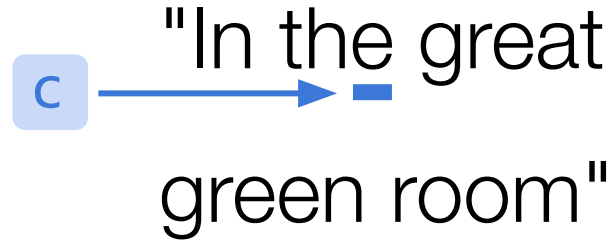
The diagram illustrates the iteration process. A light blue square containing the letter 'c' has a blue arrow pointing to the right. The arrow points to a small blue square that is positioned under the space character between the words 'great' and 'green' in the string "In the great green room".

```
for c in text:  
    print(c)
```



The diagram illustrates the iteration process. A light blue square containing the letter 'c' has a blue arrow pointing to the right. The arrow points to a small blue horizontal bar located under the space character between the words 'great' and 'green' in the string "In the great green room".

```
for c in text:  
    print(c)
```



The diagram illustrates the iteration of a loop over a string. A light blue box containing the letter 'c' has a blue arrow pointing to the right, ending at a small blue horizontal bar. This bar is positioned under the space character between the words 'great' and 'green' in the string "In the great green room".

```
words = text.split()
```

"In the great
green room"

```
words = text.split()
```

```
["In", "the", "great",  
"green", "room"]
```

```
words = text.split()
for word in words:
    print(word)
```

```
["In", "the", "great",  
"green", "room"]
```

```
words = text.split()
for word in words:
    print(word)
```

word

→ ["In", "the", "great",
"green", "room"]


```
words = text.split()
for word in words:
    print(word)
```

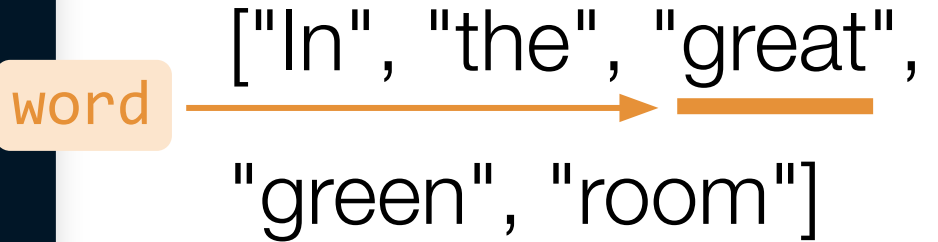
word

→ ["In", "the", "great",
"green", "room"]

```
words = text.split()
for word in words:
    print(word)
```

word

["In", "the", "great",
"green", "room"]

A diagram illustrating the iteration process. An orange rounded rectangle labeled 'word' has an orange arrow pointing to the word 'great' in a list of words. The list is displayed across two lines: ["In", "the", "great", "green", "room"]. The word 'great' is underlined with a thick orange line.

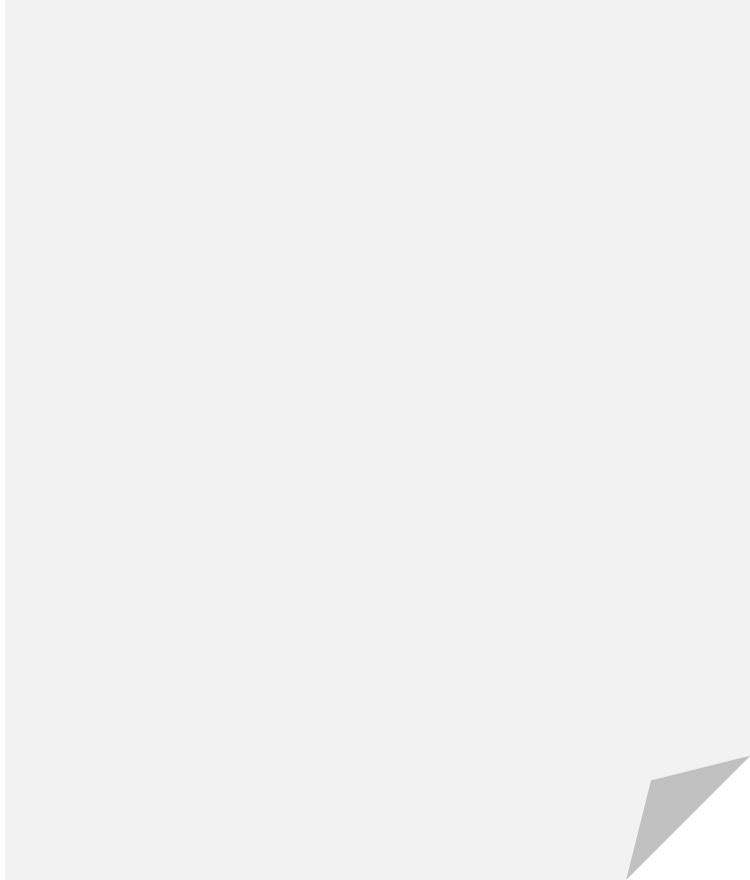
- Python's **for / in** syntax helps you iterate through components of an "iterable" while referring to them by a convenient name.
- When your *iterable* is a **list**, you'll iterate over every element of the **list**.
- When your *iterable* is a **string**, you'll iterate over every **character** of the **string**.

Text Analysis

Look at [text.py](#).

Using what you know about Python's syntax, guess what each round of loops will print to the terminal.

Dictionaries



authors

Goodnight Moon

Margaret Wise Brown

Corduroy

Don Freeman

Curious George

H.A. Ray

authors

Goodnight Moon

Margaret Wise Brown

Corduroy

Don Freeman

Curious George

H.A. Ray

Key

Value



book

Title

Goodnight Moon

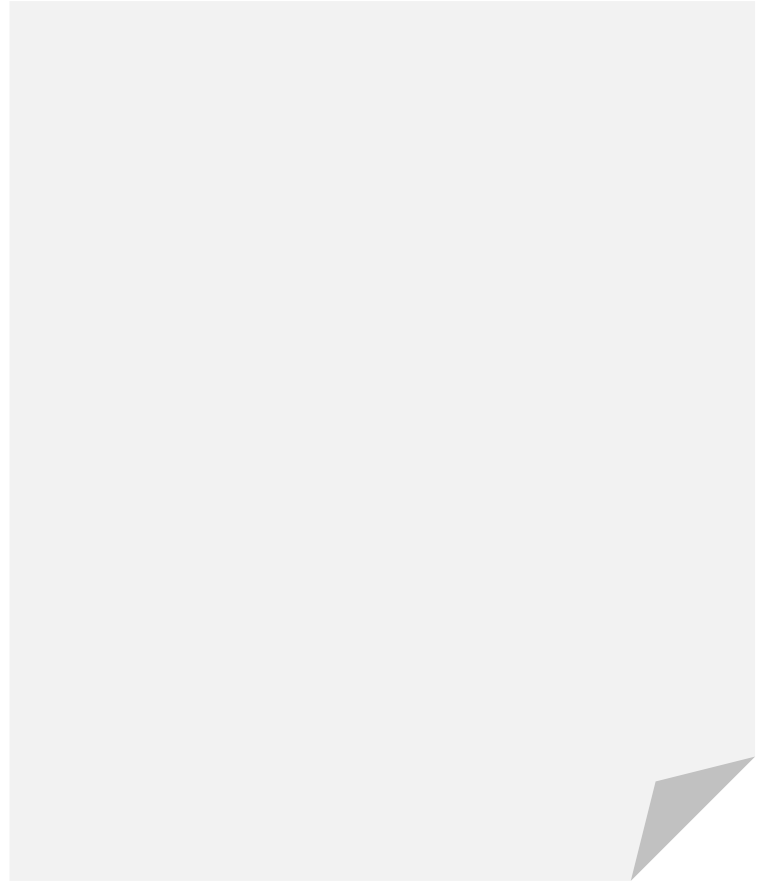
Author

Margaret Wise Brown

```
book = dict()
```

```
book = dict()
```

book



```
book = dict()  
book["title"] = "Corduroy"
```

book

title

Corduroy

```
book = dict()  
book["title"] = "Corduroy"  
book["author"] = "Don Freeman"
```

book

title

Corduroy

author

Don Freeman

```
book = dict()
book["title"] = "Corduroy"
book["author"] = "Don Freeman"
print(book["title"])
```

book

title

Corduroy

author

Don Freeman

```
book = dict()
book["title"] = "Corduroy"
book["author"] = "Don Freeman"
print(book["title"])

# "Corduroy"
```

book

title

Corduroy

author

Don Freeman

```
book = dict()  
book["title"] = "Corduroy"  
book["author"] = "Don Freeman"  
print(book["Corduroy"])
```

book

title

Corduroy

author

Don Freeman


```
book = dict()  
book["title"] = "Corduroy"  
book["author"] = "Don Freeman"  
print(book["Corduroy"])
```

KeyError: 'Corduroy'

book

title

Corduroy

author

Don Freeman

```
book = {  
    "title": "Goodnight Moon",  
    "author": "Margaret Wise Brown"  
}
```

```
[{"title": "Goodnight Moon", ...},  
 {"title": "Corduroy", ...},  
 {"title": "Curious George", ...}]
```

```
[{"title": "Goodnight Moon", ...},  
 {"title": "Corduroy", ...},  
 {"title": "Curious George", ...}]
```

```
[{"title": "Goodnight Moon", ...},  
 {"title": "Corduroy", ...},  
 {"title": "Curious George", ...}]
```

Shelf of Books

Download [books.py](#).

Complete **books.py** so that a user is prompted to continue adding books (with a title and author) to a list of books.

Libraries and Modules

AutoSave OFF

books

Home Insert Draw Page Layout Formulas Data Review View Acrobat Tell me

Calibri (Body) 12 A⁺ A⁻

Paste

B I U

Number

Conditional Formatting

Format as Table

Cell Styles

Cells

Editing

Analyze Data

Create and Share Adobe PDF

Share Comments

Open recovered workbooks? Your recent changes were saved. Do you want to continue working where you left off? Yes No

A1 fx title

	A	B	C	D	E
1	title	author			
2	Goodnight Moon	Margaret Wise Brown			
3	Corduroy	Don Freeman			
4	Curious George	H.A. Ray			
5	Winnie-the-Pooh	A.A. Milne			
6	Fantastic Mr. Fox	Roald Dahl			
7	Charlotte's Web	E.B. White			
8	Rainbow Flower	Valentin Kataev			
9	The Cat That Lived	Yoko Sano			
10	The Little Prince	Antoine de Saint-Exupéry			
11	The Hen Who Drea	Sun-mi Hwang			
12	The Tale of Peter F	Beatrix Potter			
13	Matilda	Roald Dahl			

Sheet1 +

Ready Accessibility: Good to go 250%

1

title

author

2

Goodnight Moon

Margaret Wise Brown

3

Corduroy

Don Freeman

4

Curious George

H.A. Ray

5

Winnie-the-Pooh

A.A. Milne

6

Fantastic Mr. Fox

Roald Dahl

7

Charlotte's Web

E.B. White

8

Rainbow Flower

Valentin Kataev

9

The Cat That Lived

Yoko Sano

10

The Little Prince

Antoine de Saint-Exupéry

11

The Hen Who Drea

Sun-mi Hwang

12

The Tale of Peter F

Beatrix Potter

13

Matilda

Roald Dahl

books.csv

title,author

Goodnight Moon,Margaret Wise Brown

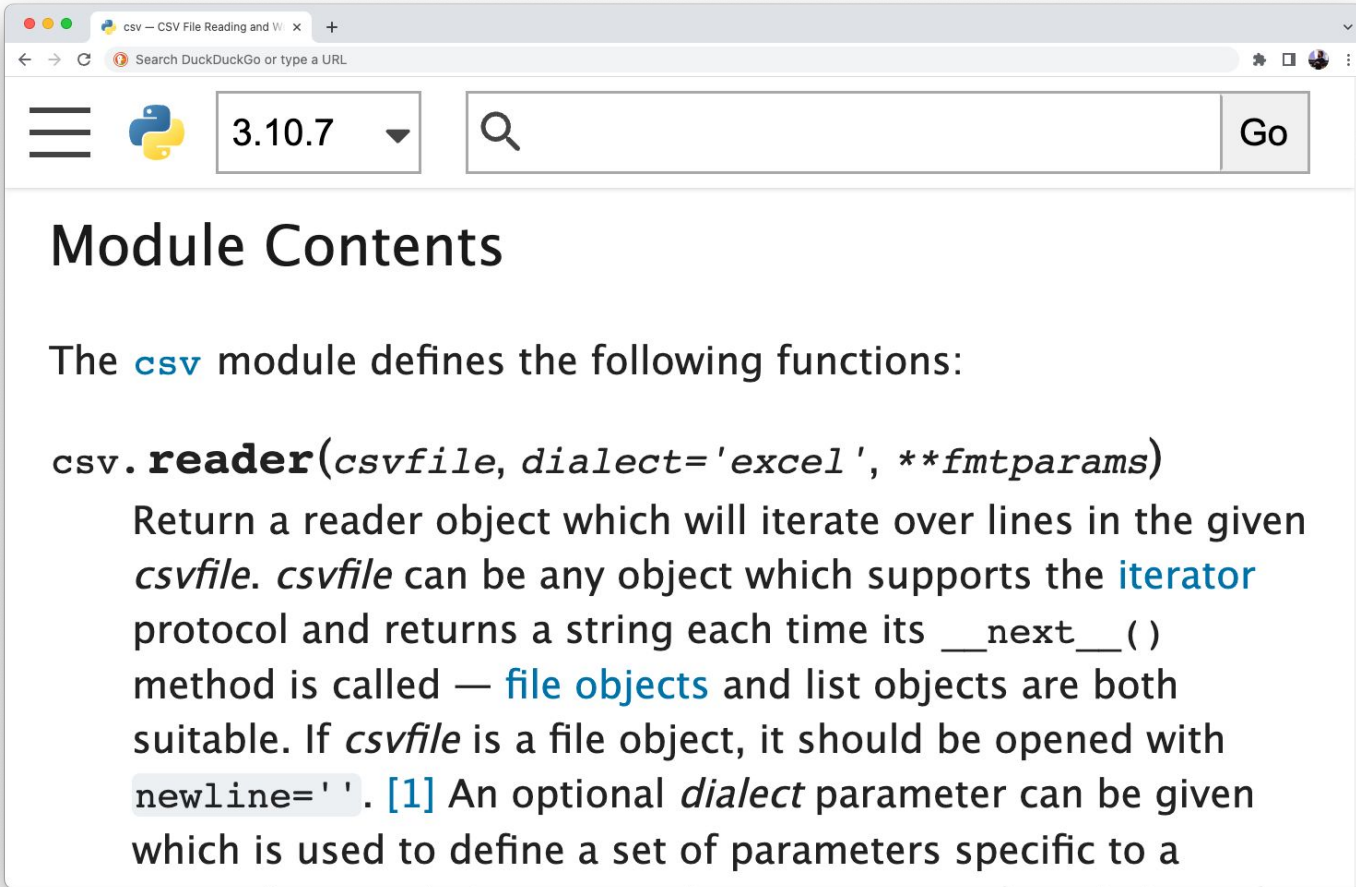
Corduroy,Don Freeman

Curious George,H.A. Ray

Winnie-the-Pooh,A.A. Milne

Fantastic Mr. Fox,Roald Dahl

...



The screenshot shows a web browser window with the address bar containing "Search DuckDuckGo or type a URL". The page title is "csv - CSV File Reading and Writing". The navigation bar includes a hamburger menu, the Python logo, a version selector set to "3.10.7", a search box, and a "Go" button. The main content area has the heading "Module Contents" and a paragraph stating: "The `csv` module defines the following functions:". Below this, the function signature is shown: `csv.reader(csvfile, dialect='excel', **fmtparams)`. The text explains that `reader` returns a reader object that iterates over lines in `csvfile`, which can be any object supporting the iterator protocol. It notes that `file objects` and `list objects` are both suitable, and that `csvfile` should be opened with `newline=''`. A reference [1] is provided for the `dialect` parameter.

Module Contents

The `csv` module defines the following functions:

`csv.reader(csvfile, dialect='excel', **fmtparams)`

Return a reader object which will iterate over lines in the given `csvfile`. `csvfile` can be any object which supports the `iterator` protocol and returns a string each time its `__next__()` method is called — `file objects` and `list objects` are both suitable. If `csvfile` is a file object, it should be opened with `newline=''`. [1] An optional `dialect` parameter can be given which is used to define a set of parameters specific to a

```
import csv
```

```
import csv
```

CSV

```
import csv
```

DictReader

DictWriter

reader

writer

```
import csv
```

```
csv.DictReader(...)
```

DictReader

DictWriter

reader

writer

```
import csv
```

```
csv.DictReader(...)
```

```
csv.reader(...)
```

DictReader

DictWriter

reader

writer

```
import csv
```

DictReader

DictWriter

reader

writer


```
from csv import DictReader
```

DictReader

DictWriter

reader

writer

```
from csv import DictReader  
DictReader(...)
```

DictReader

DictWriter

reader

writer

File Reading and Writing

```
with open(FILENAME) as file:
```

```
with open(FILENAME) as file:  
    text = file.read()
```

```
with open(FILENAME) as file:  
    file_reader = csv.DictReader(file)
```

```
with open(FILENAME) as file:  
    file_reader = csv.DictReader(file)  
    for row in file_reader:
```

```
with open(FILENAME) as file:  
    file_reader = csv.DictReader(file)  
    for row in file_reader:  
        ...
```


Good reads

Download [reads.py](#) and [books.csv](#).

Complete **reads.py** so that a user can build a list of children's books.

This is CS50

Week 6