

## Reading Files

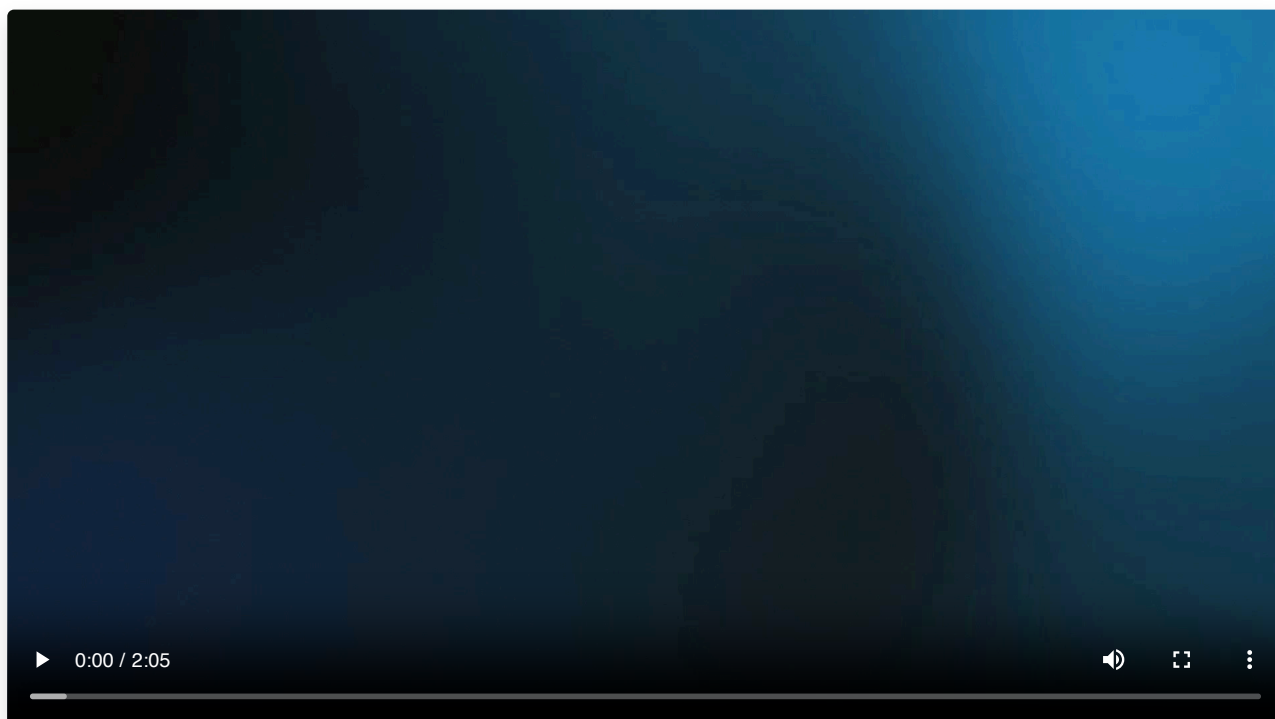
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### Textbook

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# Reading Files

## The Autograder



## Reading Files



One of the most useful features of Python is the ability to create, read, write, and edit files. This lesson covers the basics of this functionality.

## Overview

Python programs have the ability to access other files on your computer. As long as you tell your program the exact location of the file, it can open it, read the contents, edit them, and make other changes.

This can be useful in many different ways. Let's say you have been given a large folder with 10,000 text files, and been assigned to change all the names of the text files to 'file1.txt', 'file2.txt' and so on. You could do this one by one, which would likely take hours and hours to complete.

With Python, you could write a short, simple program that can make all those changes in a matter of seconds! We'll learn more about this in the next few lessons.

## What is a Text File?

A text file is a file that has only information in it without any formatting. Often, when you type out an essay for a class, it has formatting such as margins, spacing, or indentation. A text file only has the information typed inside. Text files are useful because they don't take up very much storage space. Often, large databases of records are saved in text files to minimize the amount of storage they take. Information such as financial records, medical information, or weather information are often saved as text files.

## What is a Binary File?

Binary files take text files and represent them much more compactly by using binary instead of letters and words from the ASCII table.

For now, we will focus on text files.

## File Handling

Creating, opening, reading, and writing files are all part of [file handling](#). File handling is using Python code to work with different files.

## Create a Text File

Let's create a text file in Skill Struck! At the top of your code editor you can see the name of your file. Click on the name of your file and it will pull up a dropdown menu. Select **+ File** to create a new file. Create the file in the same folder as your Python tile. You can then name the file whatever you would like. **Make sure to**

**select the file extension that says .txt** . This will make sure you are creating a text file. This is similar to when you create a python file you need to select the .py extension.

Now that you have created the text file, it's time to put some text inside! In the code editor, type out a few sentences so we can work with them later! For example:

```
Here I am in my text file! What should I say? I know, I'll write a short journal about my
day yesterday. After school I went to the park and got to rock climb for a bit! It's so
fun! Then we had tacos for dinner—my favorite!
```

And there you go! You've just created a text file and entered some information! (Make sure to hit **save** when you change or add code to any file you are working on!)

Now let's read that file using the Python language!

## Reading Files



When writing a Python program to read a file, the first thing to do is open the file. Let's say you have a text file called "example.txt" and you want to write a program that prints out the contents of the file.

First, create a variable and set it equal to the `open()` function. This function takes in 2 parameters

1. The name of the file to open `example.txt`
2. The mode in which to open it `r`

See the example below.

```
1 file = open("example.txt", "r")
2
```

This opens the file, and creates a file variable which is now called `file`. We used the "r" mode in the function which stands for "read". **Because we opened it in this mode, it's not possible for us to change the file, our program can only read it.**

The variable named `file` is also considered a [file handler](#). This variable allows us to work with files by using Python.

To print the contents of the file, use the `read()` function in a print statement.

```
1 file = open("example.txt", "r")
2 print(file.read())
3
```

The `read()` function is called on the "file" variable and reads all the text in the file. It is then printed out with the print command. Read more on this function [here](#).

## Closing Files

When your program is finished reading the file, it's important to close it. This helps to free up working memory. This is done in your Python file by calling the `close()` function on your variable named file.

```
1 file.close()
```

So everything we have learned in this lesson should look like this.

```
1 file = open("example.txt", "r")
2 print(file.read())
3 file.close()
```

## Checkpoint

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### Reading Files

Practice reading a text file using the Python language!

1. Create a text file that has a `.txt` extension and enter in a sentence or two.
2. Navigate back to your Python file that has a `.py` extension.
3. Inside your Python file create a variable and assign it to a command to open the text file. Make sure to include the `r` which means to read!
4. In a print statement, read the text file. This should print the contents of the text file to the console.

Note: If your files are inside of a folder, be sure to include folder name in the open command.

For example, if your folder name is "Python" and your `.txt` filename is "example.txt," your `open` command's first argument should look like this:

```
"Python/example.txt"
```

### Requirements:

- In your Python file, create a variable and set it equal to a command to open the text file.

- Print the contents of the text file

## Questions (9)

1. In the `open()` function, what does the "r" stand for?

MULTIPLE CHOICE

Choose the correct answer:

- A. read
- B. reply
- C. revise
- D. review

2. What is an advantage of using a text file?

MULTIPLE CHOICE

Choose the correct answer:

- A. They include helpful formatting
- B. They don't take up much space
- C. They can hold any character in Unicode
- D. They are more secure

3. When you open a file using the following code, which of the following can be done with the file? Select all that apply.

SELECT MULTIPLE

```
file = open("example.txt", "r")
```

Select all that apply:

- A. Read from the file named example.txt
- B. Write to the file named example.txt

4. What kind of file extension is used to create a text file?

MULTIPLE CHOICE

Choose the correct answer:

- A. .txt
- B. .py
- C. .html
- D. .js

MULTIPLE CHOICE

**5. In this example, which bit of code is considered the file handler?**

```
myfile = open("example.txt", "r")
```

**Choose the correct answer:**

- A. open()
- B. example.txt
- C. r
- D. myfile

MULTIPLE CHOICE

**6. What is the purpose of the "read()" function in Python when working with files?****Choose the correct answer:**

- A. It opens the file for reading.
- B. It writes text to the file.
- C. It deletes the contents of the file.
- D. It reads the text from the file.

MULTIPLE CHOICE

**7. Why is it important to close a file after reading its contents in Python?****Choose the correct answer:**

- A. It prevents other programs from accessing the file.
- B. It helps maintain the file's formatting.
- C. It saves the changes made to the file.
- D. It frees up working memory.

MULTIPLE CHOICE

**8. What is the purpose of the following command?**

```
file = open("example.txt", "r")
```

**Choose the correct answer:**

- A. It reads the contents of the file named example
- B. It opens the file named example and makes it possible to read
- C. It opens the file named example and makes it possible to edit
- D. It reads the contents of the file named file

## 9. Debug the following code:

[DEBUG CODE](#)

### Code to Debug:

```
1 file = open("example.txt", "r")
2 print(file.read)
```

## Challenges (2)

### 1. Secret Message

1. Pretend like you are a secret agent that needs to access some highly classified files. You've been given special clearance to read a certain text file.
2. You've been given an anonymous tip that the name of the text file you need is `cobra.txt`.
3. You know that the file named `cobra` is in a database with hundreds of thousands of files. Luckily, you know Python!
4. Write a Python program that will read the contents of the top secret file named `cobra`.

#### Requirements:

- In your Python file, create a variable and assign it to a command to open the file named `cobra`.
- Print the contents of the text file

### 2. Read the Speech

Create a Python program that will read a text file named `speech.txt`.

#### Requirements:

- In your Python file, create a variable and assign it to a command to open the file named `speech`.
- Print the contents of the text file



## Answer Keys & Solutions

### Checkpoint Solutions

#### Reading Files

```
1 file = open("example.txt", "r")
2 print(file.read())
```

### Questions

1. In the open() function, what does the "r" stand for?

MULTIPLE CHOICE

Correct Answer:

- |           |             |
|-----------|-------------|
| A. read   | ✓ Correct   |
| B. reply  | ✗ Incorrect |
| C. revise | ✗ Incorrect |
| D. review | ✗ Incorrect |

2. What is an advantage of using a text file?

MULTIPLE CHOICE

Correct Answer:

- |   |             |
|---|-------------|
| A. They include helpful formatting        | ✗ Incorrect |
| B. They don't take up much space          | ✓ Correct   |
| C. They can hold any character in Unicode | ✗ Incorrect |
| D. They are more secure                   | ✗ Incorrect |

3. When you open a file using the following code, which of the following can be done with the file? Select all that apply.

SELECT MULTIPLE

Correct Answers:



A. Read from the file named example.txt

✓ Correct

B. Write to the file named example.txt

✗ Incorrect

#### Explanation:

Because we used the code "r" when opening this file, we can only read from the file.

### 4. What kind of file extension is used to create a text file?

MULTIPLE CHOICE

#### Correct Answer:

A. .txt

✓ Correct

B. .py

✗ Incorrect

C. .html

✗ Incorrect

D. .js

✗ Incorrect

#### Explanation:

.js is for JavaScript, .py is for Python, .html is for HTML

### 5. In this example, which bit of code is considered the file handler?

MULTIPLE CHOICE

#### Correct Answer:

A. open()

✗ Incorrect

B. example.txt

✗ Incorrect

C. r

✗ Incorrect

D. myfile

✓ Correct

#### Explanation:

A file handler is a variable used to work with files using the Python language.

## 6. What is the purpose of the "read()" function in Python when working with files?

MULTIPLE CHOICE

Correct Answer:

- A. It opens the file for reading. ✗ Incorrect
- B. It writes text to the file. ✗ Incorrect
- C. It deletes the contents of the file. ✗ Incorrect
- D. It reads the text from the file. ✓ Correct

### Explanation:

read() is for reading the content

## 7. Why is it important to close a file after reading its contents in Python?

MULTIPLE CHOICE

Correct Answer:

- A. It prevents other programs from accessing the file. ✗ Incorrect
- B. It helps maintain the file's formatting. ✗ Incorrect
- C. It saves the changes made to the file. ✗ Incorrect
- D. It frees up working memory. ✓ Correct

### Explanation:

Having too many files open slows down working memory

## 8. What is the purpose of the following command?

MULTIPLE CHOICE

Correct Answer:

- A. It reads the contents of the file named example ✗ Incorrect
- B. It opens the file named example and makes it possible to read ✓ Correct
- C. It opens the file named example and makes it possible to edit ✗ Incorrect
- D. It reads the contents of the file named file ✗ Incorrect

**Explanation:**

The r stands for read

**9. Debug the following code:**[DEBUG CODE](#)**Incorrect Code:**

```
1 file = open("example.txt", "r")
2 print(file.read)
```

**Correct Solution:**

```
1 file = open("example.txt", "r")
2 print(file.read())
```

**Explanation:**

The read function needs parentheses

**Challenges****1. Secret Message****Solution:**

```
1 file = open("cobra.txt", "r")
2 print(file.read())
```

**2. Read the Speech****Solution:**

```
1 file = open("speech.txt", "r")
2 print(file.read())
```