

**Software Engineering
Bootcamp**



Working with External Data Sources - Input

Objectives

- Create smarter programs by learning how to read data from text files

File I\O

- ★ File I\O stands for file **input\output**
- ★ Is a process that **reads** data from an **external file** on the computer or **outputs** to another file.
- ★ Python has a built-in file type, which is **complex data type**.
- ★ Meaning that Python can **create variables of type "file"**.

Opening a File

- ★ To read from a file, we must first open it.
- ★ To open a file, we use Python's built-in `open()` function, which creates what is known as a file object.
- ★ To utilize the file object's data, we store the file object in a variable.
- ★ Once we are done, we then close the file.

Opening Files

- ★ To use a file in our program, we store the file object in a variable as such :

- **file = open(file_name , access_mode)**

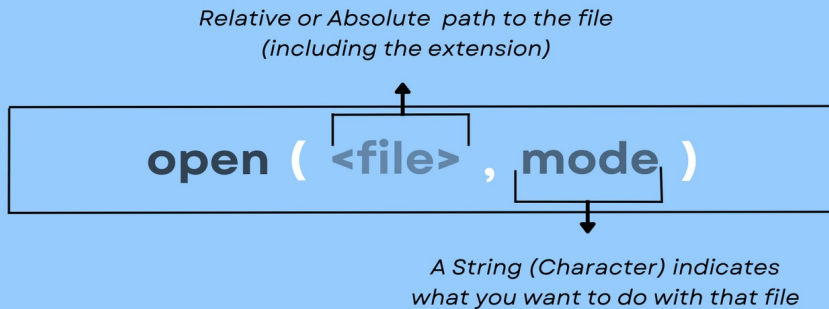
- ★ **Access mode** : what the user can do when the file has been opened, such as, reading (r), writing (w) or reading and writing (r+).

File Modes

Table 1: Python File modes

Mode	Description
'r'	Opens a file for reading.
'w'	Open a file for writing. If file does not exist, it creates a new file. If file exists it truncates the file.
'a'	Open a file in append mode. If file does not exist, it creates a new file.
'+'	Open a file for reading and writing (updating)

Opening Files



Opening Example

```
# To make opening the file easier,  
#   best to keep the text file in the  
#       same location as your Python file.  
  
file_name = "input.txt"  
  
file = open(file_name, "r")  
  
# File is now being read by Python.
```


Reading Files

- ★ Files are opened in Python with the `open()` function. We know that `open()` will return a `file object`.
- ★ To then properly read the object, we will need to use the `read method`.
- ★ Three methods : `.read()` , `.readline()`, `.readlines()`

Read Example

```
file_name = "input.txt"

file = open(file_name, "r")

# Read will simply read over all lines in
# our text file. We can display them by printing.
lines = file.read()

print(lines)
```

Readline Example

```
file_name = "input.txt"

file = open(file_name, "r")

# Readline will simply read over the first line in
# our text file. We can display them by printing.
line = file.readline()

print(line)
```

Readlines Example

```
file_name = "input.txt"

file = open(file_name, "r")

# Readlines will simply read over each line individually
# within the text file. We can display them by printing.
line = file.readlines()

print(line)
# Keep in mind that the output is actually a list.
```

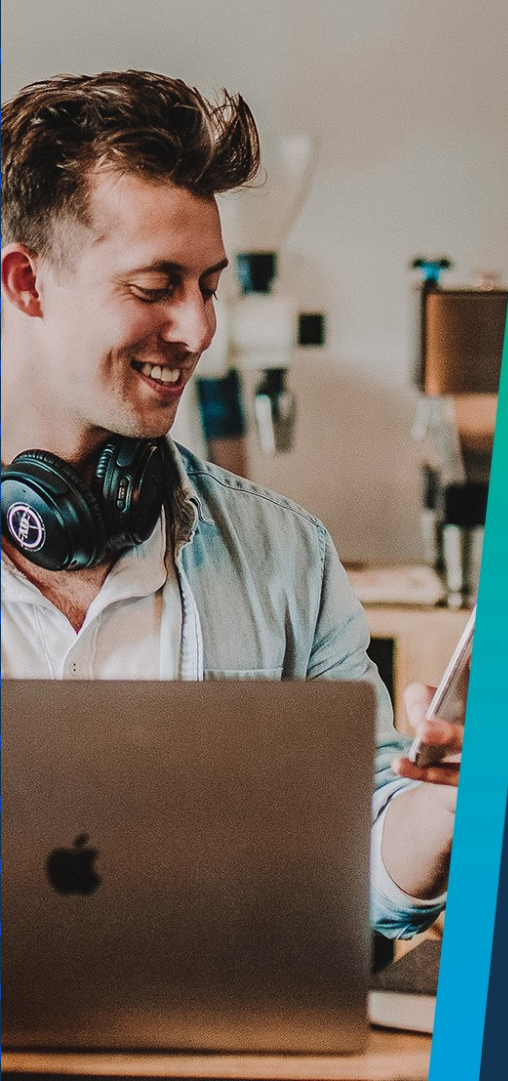
Closing a File

- ★ The `close()` method ensures **system resources** are **not wasted** in our programs.
- ★ It is always **best practice** to close files when you are **finished** working with them.
- ★ Remember that once a file is closed, it cannot be read again until it is **re-opened**.



Q & A Section

Please use this time to ask any questions relating to the topic explained, should you have any



**Thank you
for joining us**