Welcome to this CoGrammar Lecture: Text File I/O

The session will start shortly...

Questions? Drop them in the chat. We'll have dedicated moderators answering questions.

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Software Engineering Session Housekeeping

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly. **(Fundamental British Values: Mutual Respect and Tolerance)**
- No question is daft or silly - **ask them!**
- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.
- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Academic Sessions. You can submit these questions here: **Questions**

Software Engineering Session Housekeeping cont.

- For all **non-academic questions**, please submit a query: **www.hyperiondev.com/support**

- Report a **safeguarding** incident: **www.hyperiondev.com/safeguardreporting**

- We would love your **feedback** on lectures: **Feedback on Lectures**

Skills Bootcamp
8-Week Progression Overview

Fulfil 4 Criteria to Graduation

✅ Criterion 1: Initial Requirements

Timeframe: First 2 Weeks
Guided Learning Hours (GLH): Minimum of 15 hours
Task Completion: First four tasks

Due Date: 24 March 2024

✅ Criterion 2: Mid-Course Progress

60 Guided Learning Hours

Data Science - **13 tasks**
Software Engineering - **13 tasks**
Web Development - **13 tasks**

Due Date: 28 April 2024

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Skills Bootcamp Progression Overview

✅ **Criterion 3: Course Progress**

Completion: All mandatory tasks, including Build Your Brand and resubmissions by study period end
Interview Invitation: Within 4 weeks post-course
Guided Learning Hours: Minimum of 112 hours by support end date (10.5 hours average, each week)

✅ **Criterion 4: Demonstrating Employability**

Final Job or Apprenticeship Outcome: Document within 12 weeks post-graduation
Relevance: Progression to employment or related opportunity

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Text File IO

March 2024

Agenda

- File I/O
  - Resource Management
    - Implicit File Handling
    - Explicit File Handling
  - Reading from Files
  - Writing to Files

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What is File I/O ?

- **File I/O** stands for **Input/Output** operations involving files.
- It refers to the process of reading data from files (**input**) or writing data to files (**output**) using a computer program.

In simpler terms, file I/O is all about your program interacting with files: either taking in information from them or putting information into them. It's like the communication link between your program and the outside world of files.

File Handling

- **File modes** in Python are specifications used when opening a file to indicate the intended operation that will be performed on the file. These modes determine whether the file will be opened for reading, writing, appending, or for a combination of reading and writing

- **File handling** in Python refers to the process of working with files on your computer's storage. It allows you to read from, write to, and manipulate files. Python provides built-in functions and methods for performing various file operations.

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File Modes

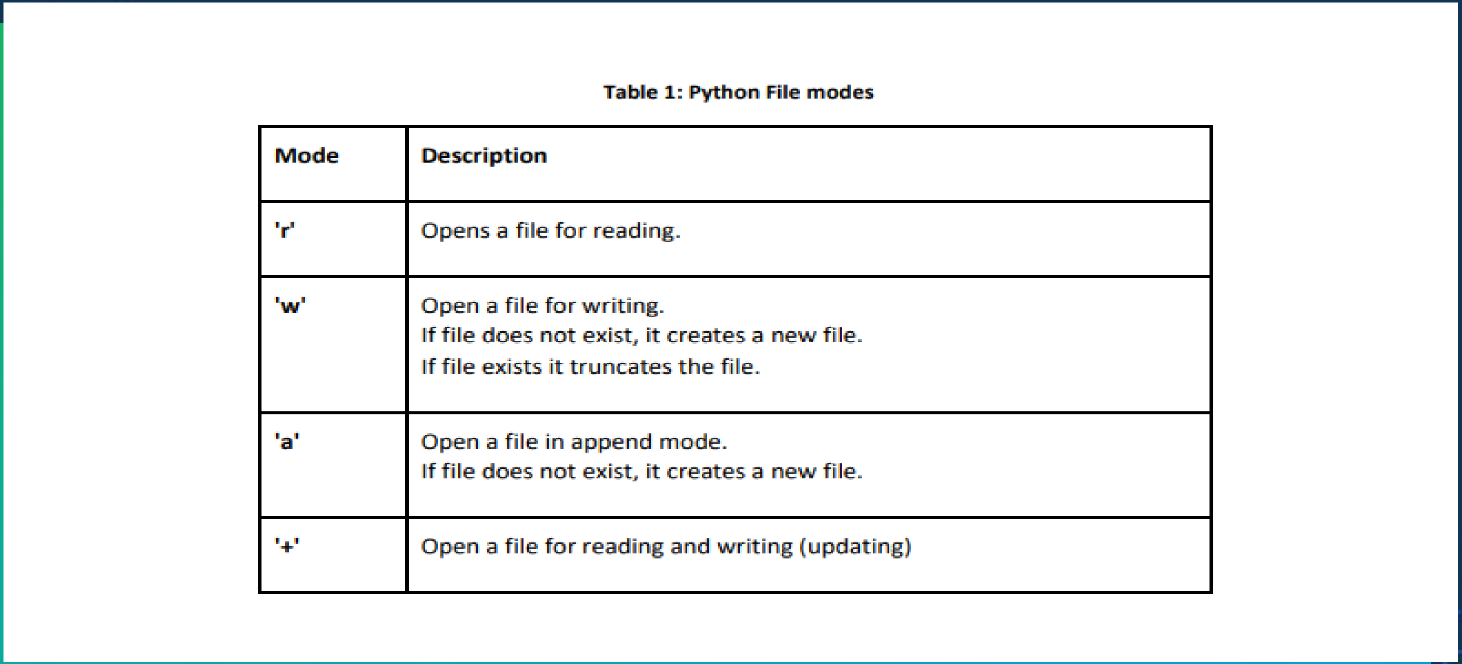

Table 1: Python File modes

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)

File Handling

- In Python, file I/O operations are performed using the **open()** function and various methods associated with file objects.

- **Opening Files:** The **open()** function is used to open a file and returns a file object. You specify the file name/path and the mode in which you want to open the file ('r' for reading, 'w' for writing, 'a' for appending, etc.).

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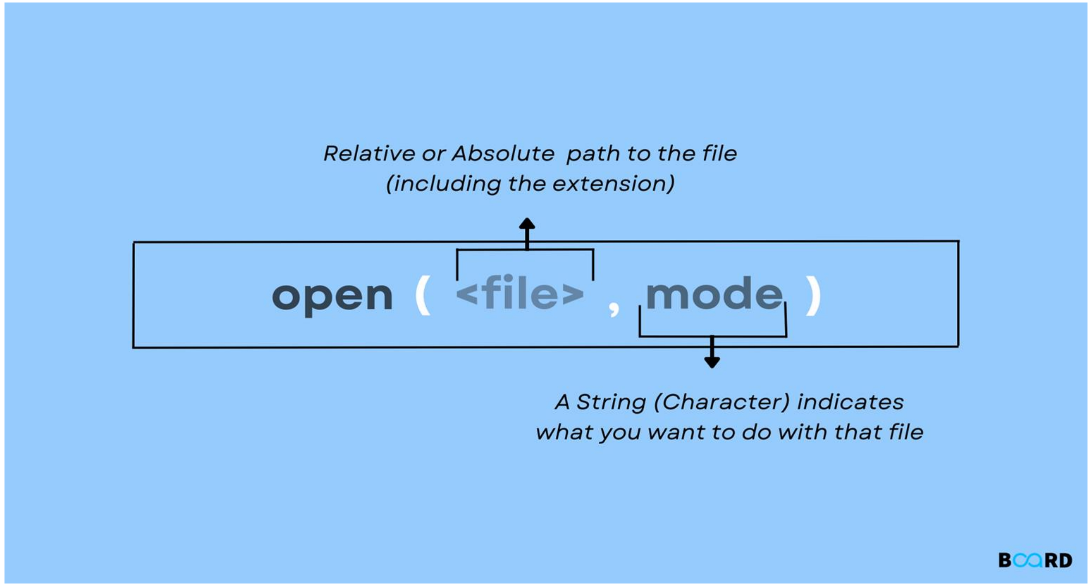
Opening Files


Relative or Absolute path to the file
(including the extension)
open (<file> , mode)
A String (Character) indicates
what you want to do with that file
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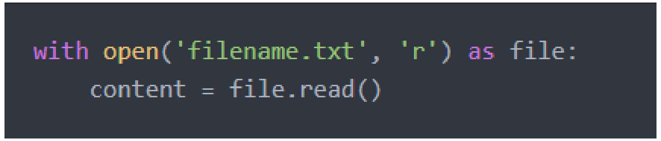
Resource Management

Implicit Method

❖ The **with** statement is used for resource management in Python.

❖ It ensures that resources are properly cleaned up after use, even if an error occurs.



```python
with open('filename.txt', 'r') as file:
    content = file.read()
```

Resource Management

Explicit Method

- The explicit way involves manually opening and closing files using the **open()** function for opening and the **close()** method for closing.

```
file = open('file.txt', 'r')
content = file.read()
file.close()
```

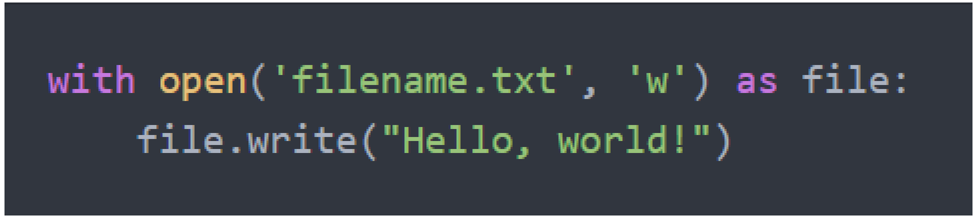
File Modes (r)

❖ **Reading from Text Files:** You can read text from a file using the **open()** function with the mode **'r'**

```python
with open('filename.txt', 'r') as file:
    content = file.read()
```

File Modes (w)

- **Writing to Text Files:** You can write text to a file using the **open()** function with the mode **'w'**



```python
with open('filename.txt', 'w') as file:
    file.write("Hello, world!")
```

File Modes (a)

- **Appending to Text Files:** You can append text to an existing file using the **open()** function with the mode **'a'**

```python
with open('filename.txt', 'a') as file:
    file.write("\nThis is a new line.")
```

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File Handling (Reading)

Read from a File Python
Methods

read()
Reads the entire contents of the file and returns it as a string.

readline()
Reads a single line from the file and returns it as a string.

readlines()
Reads all lines from the file and returns them as a list of strings.

File Handling (Writing)

Write to a File Python

Methods

write()
This method is used to write data to the file. It takes a string argument and adds it to the end of the file.

writelines()
This method writes a sequence of strings to the file. It takes a list of strings as an argument and writes each string to the file.

Exception Handling

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Exception Handling

- **Exception handling** in Python allows you to gracefully manage errors that may occur during program execution, including when working with files.
- It enables you to anticipate and respond to errors without crashing the program.

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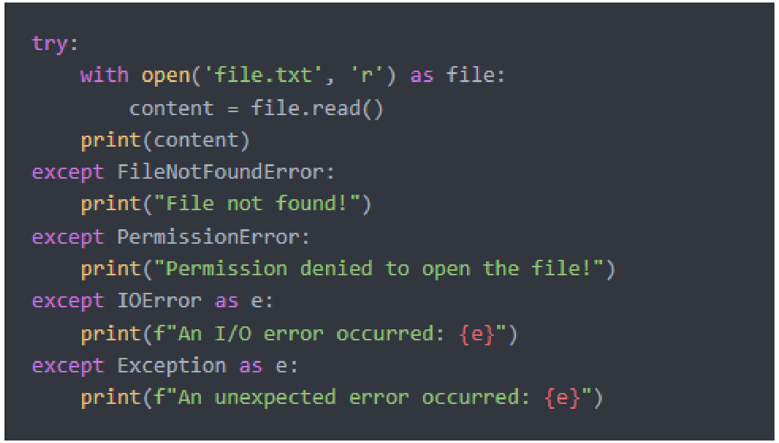
Try / Except

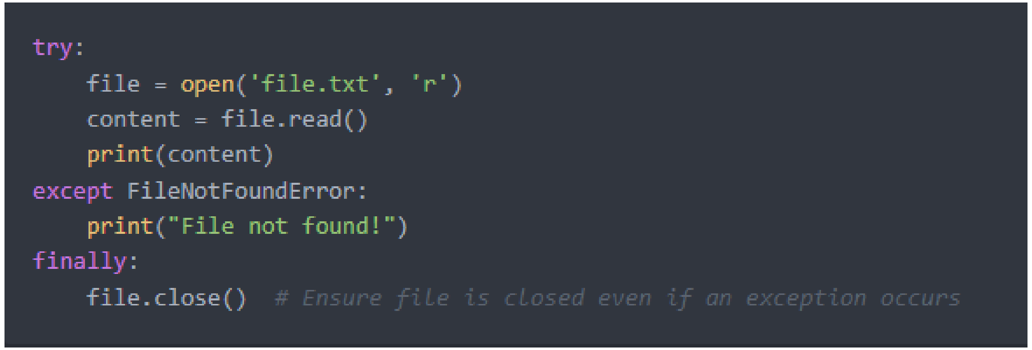
- You can wrap file I/O operations inside a try block and catch specific exceptions using except blocks.



```python
try:
    with open('file.txt', 'r') as file:
        content = file.read()
    print(content)
except FileNotFoundError:
    print("File not found!")
except PermissionError:
    print("Permission denied to open the file!")
except IOError as e:
    print(f"An I/O error occurred: {e}")
except Exception as e:
    print(f"An unexpected error occurred: {e}")
```

Try / Except / Finally

❖ We can also use a **finally** block to ensure that certain cleanup actions are always performed, regardless of whether an exception occurred or not.



```python
try:
    file = open('file.txt', 'r')
    content = file.read()
    print(content)
except FileNotFoundError:
    print("File not found!")
finally:
    file.close()  # Ensure file is closed even if an exception occurs
```

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Questions and Answers

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Thank you for attending

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