

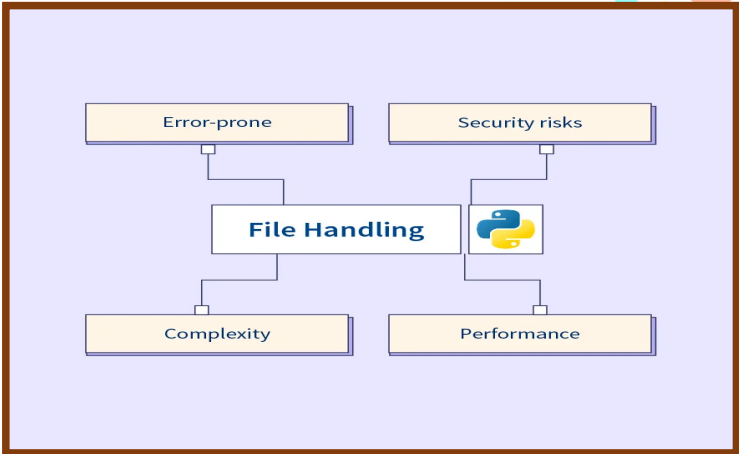
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Writing and Reading Data from a File in Python

File Handling in Python

File handling in Python refers to the process of performing operations like creating, opening, reading, writing, and closing files using built-in Python functions.

- It's a fundamental part of programming, allowing your program to interact with files stored on disk.
- In Python, file handling allows you to **store data permanently** – unlike variables, which disappear when the program stops.
- You can **create, read, write, or append** data to files easily using built-in functions.



Types of File Operations

1. Opening a file
2. Reading from a file
3. Writing to a file
4. Closing a file

1. Opening a File

To open a file, you use the open() function:

```
file = open("filename.txt", "mode")
```

Here,

- "filename.txt" → name of the file (you can include the path)
- "mode" → tells Python what you want to do with the file

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File Modes in Python

Mode	Meaning	Description
'r'	Read	Opens file for reading (default). Error if file doesn't exist.
'w'	Write	Opens file for writing. Overwrites existing data or creates a new file.
'a'	Append	Opens file for appending. Adds new data at the end of file.
'r+'	Read + Write	Opens file for both reading and writing.
'w+'	Write + Read	Opens file for writing and reading (overwrites).
'a+'	Append + Read	Opens file for appending and reading.

Writing Data to a File

When you want to save data, use 'w' or 'a' mode.

Solved Example 1 - Writing to a File

```
# Open file in write mode
file = open("example.txt", "w")

# Write data to file
file.write("Hello, this is my first line!\n")
file.write("Python file handling is easy!\n")

# Close the file
file.close()
print("Data written successfully!")
```

Explanation:

- If example.txt doesn't exist, Python creates it.
- Existing data will be replaced (because of 'w' mode).
- Always close the file after writing.

Solved Example 2 - Appending Data to an Existing File

```
file = open("example.txt", "a")
file.write("This line is added later.\n")
file.close()
```



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Explanation:

- 'a' mode adds new text to the end of the file instead of overwriting it.

Reading Data from a File

To read data, open the file in 'r' mode.

Solved Example 3 - Reading Entire File

```
file = open("example.txt", "r")  
content = file.read()  
print(content)  
file.close()
```

Explanation:

- file.read() reads all the text at once as a single string.
- You can then print or process it.

Solved Example 4 - Reading Line by Line

```
file = open("example.txt", "r")  
for line in file:  
    print(line.strip()) # strip() removes extra spaces/newlines  
file.close()
```

Explanation:

- The file object acts like a list of lines.
- This method is memory-friendly for large files.

Solved Example 5 - Reading Specific Number of Characters

```
file = open("example.txt", "r")  
print(file.read(10)) # Reads only first 10 characters  
file.close()
```

Solved Example 6 - Reading Lines into a List

```
file = open("example.txt", "r")  
lines = file.readlines()  
print(lines)  
file.close()
```

Output Example:

```
['Hello, this is my first line!\n', 'Python file handling is easy!\n', 'This line is added later.\n']
```

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Best Practice: Use with Statement

Using with open() automatically closes the file after use.
with open("example.txt", "r") as file:
 data = file.read()
 print(data)

No need to call file.close() – Python handles it.

File Path

A file path is the exact location of a file or folder in your computer's storage system. It tells Python (or any program) where to find or save a file.

Types of File Path

Type	Example	Description
Absolute Path	C:/Users/Ali/Documents/file.txt	Full path from the root of the file system.
Relative Path	files/data.txt	Path relative to the current working directory.

Summary

- Use open(filename, mode) to open files.
- Use .write() or .writelines() to write.
- Use .read(), .readline(), or .readlines() to read.
- Always close the file or use with.

Solved Example:

Ques: Write a Python program to create a file named info.txt and write the following lines into it:

Python is fun!
File handling makes it powerful.

Then, read the same file and display its contents on the screen.

Hint:

Use file modes 'w' for writing and 'r' for reading.
Don't forget to close the file after each operation.

Solution:



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Writing and Reading Data from a File in Python

```
# Create and write data into a file  
file = open("info.txt", "w") # 'w' mode means write  
file.write("Python is fun!\n")  
file.write("File handling makes it powerful.\n")  
file.close()
```

```
# Read and display data from the file  
file = open("info.txt", "r") # 'r' mode means read  
content = file.read()  
print(content)  
file.close()
```

Expected Output:

Python is fun!
File handling makes it powerful.

Assignment

Ques 1: Write a Python program to create a file called `students.txt` that stores the names of three students – *Ravi*, *Sita*, and *Amit* – each on a new line. After writing the data, read the file and display the list of students.

Hint:

Use `\n` (newline character) to write each name on a separate line and `read()` to display all contents.

Ques 2: Write a Python program to open an existing file named `notes.txt` and append the following two lines to it:

Learning Python is easy.
Practice makes you perfect!

Then, read and print the complete file content to confirm that the new lines have been added successfully.

Hint:

Use file mode `'a'` for appending and `'r'` for reading.

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