

## Introduction

File Handling = Reading / Writing / Modifying external files with Python

Used in:






- Data storage (long term)
  - Sharing between programs
  - Logs
  - Large datasets (ML, AI)
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## What is File Handling?





Python variables = temporary memory

Files = permanent storage

**Basic operations:**

- Open 
  - Read 
  - Write 
  - Append 
  - Close 
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## Why Use Files?


-  Save data after program ends
  -  Interact between programs
  -  Store logs
  -  Handle large datasets (CSV/JSON)
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## Syntax to Open a File


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

Modes:

Mode	Meaning	Behavior
r	Read	Fails if file not found ✕
w	Write	Overwrites / Creates new file
a	Append	Adds at the end of file
r+	Read + Write	Both actions on existing file

 Always close:

```
python
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file.close()
```

 Or use:

```
python
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with open(...) as file:
    ...
```

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## Examples

### Create & Write:

```
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with open('example.txt', 'w') as file:
    file.write("This is written with write mode.")
```

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### Read a File:

```
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try:
```

```
with open('example.txt', 'r') as file:
    content = file.read()
    print(content)
except FileNotFoundError:
    print("File not found!")
```

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## + Append to File:

```
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with open('example.txt', 'a') as file:
    file.write("\nAppended new line.")
```

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## Read + Write:

```
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with open('example.txt', 'r+') as file:
    content = file.read()
    file.write("\nExtra content added.")
```

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## Working with JSON

JSON = JavaScript Object Notation

- ✓ Cross-language
  - ✓ Lightweight
  - ✓ Great for APIs / ML
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## □ JSON Example

```
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import json

# Dict → JSON
data = {"name": "Haris", "age": 25, "city": "Lahore"}
with open('data.json', 'w') as file:
    json.dump(data, file)

# JSON → Dict
with open('data.json', 'r') as file:
    loaded = json.load(file)
    print(loaded)
```

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# Exception Handling in Files

```
python
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try:
    with open("missing.txt", "r") as file:
        print(file.read())
except FileNotFoundError:
    print("❗ File not found!")
```

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## Important Notes

Mode	Behavior
w	Creates or overwrites file
a	Adds content at end
r	Fails if file doesn't exist

 Always **close** files — or use `with` for auto-close

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## ☐ Best Practices

- ☒ Use `with open()`
  - ☒ Handle exceptions
  -  Careful with `w` — overwrites!
  - ☒ Prefer `.json` for structured data
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## ☒ Summary

- Use `open()` with modes: `r`, `w`, `a`, `r+`
  - Methods: `.read()`, `.write()`, `.close()`
  - Use `json.dump()` and `json.load()` for JSON
  - Wrap in `try-except` for safe file access
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## □ **Next Up:**

✦ Advanced Exception Handling

✦ Working with `.csv` files

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