# Python File Handling

## Contents



Working with files is one of the most important tasks in Python. It allows your program to **save data permanently**, share information, and process existing datasets.

```
open("filename", "mode")
```

## File Modes in Detail

| Mode | What it does | What happens if file does not exist? |
|---|---|---|
| r | Read (default) | ❌ Error (FileNotFoundError) |
| w | Write | ✅ Creates new file if missing. ❌ Overwrites if exists. |
| a | Append | ✅ Creates new file if missing. Appends at end if exists. |
| x | Create | ✅ Creates new file. ❌ Error if file already exists. |
| b | Binary | Use with others (e.g., rb, wb). Needed for images, videos. |

```
file = open("myfile.txt", "r")   # Safe read if file exists
content = file.read()
file.close()
print(content)
```

```
Hello! This is sample content for myfile.txt.
```

> ⚠️ If `myfile.txt` does not exist, this will raise **FileNotFoundError**.

# Reading Files

```
f = open("data.txt", "r")
print(f.read())   # Reads entire file as one string
f.close()
```

```
Line 1: Welcome to file handling in Python.
Line 2: This is a demo file.
```

```
f = open("data.txt", "r")
print(f.read(5))   # Reads first 5 characters only
f.close()
```

```
Line
```

```
f = open("data.txt", "r")
for line in f:
    print(line.strip())  # Reads line by line, memory efficient
f.close()
```

```
Line 1: Welcome to file handling in Python.
Line 2: This is a demo file.
```

```
with open("data.txt", "r") as f:
    print(f.read())  # Best practice: auto-closes file
```

```
Line 1: Welcome to file handling in Python.
Line 2: This is a demo file.
```

# Writing and Creating Files

```
f = open("output.txt", "w")
f.write("Hello, world!")  # Overwrites old content
f.close()
```

```
f = open("output.txt", "a")
f.write("\nMore text.")  # Appends without erasing content
f.close()
```

```
f = open("newfile.txt", "x")
f.write("This is a new file.")  # Only works if file does not exist
f.close()
```

```
---------------------------------------------------------------------------
FileExistsError                           Traceback (most recent call last)
Cell In[8], line 1
----> 1 f = open("newfile.txt", "x")
      2 f.write("This is a new file.")  # Only works if file does not exist
      3 f.close()

File ~\anaconda3\Lib\site-packages\IPython\core\interactiveshell.py:324, in _modified_
    317 if file in {0, 1, 2}:
    318     raise ValueError(
    319         f"IPython won't let you open fd={file} by default "
    320         "as it is likely to crash IPython. If you know what you are doing, "
    321         "you can use builtins' open."
    322     )
--> 324 return io_open(file, *args, **kwargs)

FileExistsError: [Errno 17] File exists: 'newfile.txt'
```

# Deleting Files and Folders

```
import os
os.remove("oldfile.txt")  # Raises error if file does not exist
```

```
if os.path.exists("oldfile.txt"):
    os.remove("oldfile.txt")
else:
    print("File does not exist.")  #  Safe delete
```

```
File does not exist.
```

# Reading Multiple Files with glob

```
import glob
files = glob.glob("data/*.txt")

for file in files:
    with open(file, "r") as f:
        print(f"Contents of {file}:")
        print(f.read())
```

```
Contents of data/file1.txt:
File1 content. Phone: 123-456-7890
Contents of data/file2.txt:
File2 content. Phone: 987-654-3210
```

```
from pathlib import Path
for file in Path("data").glob("*.txt"):
    print(file.read_text())  # Cleaner alternative
```

```
File1 content. Phone: 123-456-7890
File2 content. Phone: 987-654-3210
```

```
import re
text = "Contact: alice@example.com, bob@domain.org"
emails = re.findall(r"[\w.-]+@[\w.-]+", text)
print(emails)  # Extracts all emails
```

```
['alice@example.com', 'bob@domain.org']
```

```

```

```
text = "Call 055-123-4567 or (011)888-9988"
phones = re.findall(r"\(?\d{3}\)?[-\s]?\d{3}[-\s]?\d{4}", text)
print(phones)  # Extracts phone numbers
```

```
['055-123-4567', '(011)888-9988']
```

```
text = "User ID: 983472"
masked = re.sub(r"\d", "*", text)
print(masked)   # Masks all digits
```

```
User ID: ******
```

```
text = "User ID: 983472"
masked = re.sub(r"\d(?=\d{2})", "*", text)
print(masked)   # Masks all except last 2 digits
```

```
User ID: ****72
```

```
files = glob.glob("data/*.txt")
pattern = r"\b\d{3}[-.]\d{3}[-.]\d{4}\b"

for file in files:
    with open(file, 'r', encoding='utf-8') as f:
        content = f.read()
        matches = re.findall(pattern, content)
        print(f"Phone numbers found in {file}:", matches)
```

```
Phone numbers found in data/file1.txt: ['123-456-7890']
Phone numbers found in data/file2.txt: ['987-654-3210']
```