Ch-5 File Handling

Introduction to Files

What is a File?

A **file** is used to **store data permanently** on a storage device. Files are essential for data exchange between programs and long-term storage.

Types of Files in Python

File Type	Description
Text File	Contains readable characters (e.g., .txt, .py)
Binary File	Stores data in binary format (e.g., images, objects)
CSV File	Comma Separated Values – stores tabular data

File Paths

Path Type	Description	Example
Relative	Location relative to current directory	"data/myfile.txt"
Absolute	Complete path from root directory	"C:/Users/Name/Desktop/file.txt"

Text File Operations

Opening a Text File

Syntax:

file = open("filename.txt", “mode”)

File Modes

Mode	Description
r	Read only (default)
r+	Read and write
w	Write (overwrites existing content)
w+	Read and write, truncates file
a	Append at the end of file
a+	Read and append

Using with Statement (Best Practice)

Automatically closes the file.

```
with open("data.txt", "r") as file:
    print(file.read())
```

Writing to a File

```
file = open("notes.txt", "w")
file.write("Welcome to Python\n")
file.writelines(["Line 1\n", "Line 2\n"])
file.close()
```

Reading from a File

Method	Description
read()	Reads entire file
readline()	Reads one line
readlines()	Reads all lines into a list

```
f = open("notes.txt", "r")
print(f.read())
f.close()
```

seek() and tell()

- tell() → current cursor position
- seek(offset) → move cursor to offset

```
f = open("sample.txt", "r")
print(f.tell())      # 0
f.read(5)
print(f.tell())      # 5
f.seek(0)
f.close()
```

Binary File Operations

File Modes

Mode	Description
rb	Read binary
rb+	Read/write binary
wb	Write binary (overwrites)
wb+	Read/write binary (overwrite)
ab	Append binary
ab+	Read/append binary

Using pickle Module

```
import pickle

# Write data
with open("data.dat", "wb") as f:
    pickle.dump(["Amit", "Neha", "Ravi"], f)

# Read data
with open("data.dat", "rb") as f:
    names = pickle.load(f)
    print(names)
```

Binary File Operations

- **Create**: pickle.dump()
- **Read/Search**: pickle.load()
- **Append**: open with 'ab', then dump again
- **Update**: Load all data, modify, then rewrite entire file

CSV File Operations

What is a CSV File?

- A **Comma-Separated Values** file stores tabular data in plain text.

Using csv Module

```
import csv
```

Writing to CSV

```
import csv
with open("data.csv", "w", newline="") as f:
    writer = csv.writer(f)
    writer.writerow(["Name", "Marks"])
    writer.writerows([["Amit", 90], ["Neha", 95]])
```

Reading from CSV

```
import csv
with open("data.csv", "r") as f:
    reader = csv.reader(f)
    for row in reader:
        print(row)
```

Summary

File Type	Write Method	Read Method	Library/Function
Text File	write(), writelines()	read(), readline(), readlines()	Built-in
Binary File	pickle.dump()	pickle.load()	import pickle
CSV File	writer(), writerow()	reader()	import csv