Day 4 – 19 June 2025 (Thursday): Functions and File Handling

The fourth day of the internship focused on an important step toward writing **structured and reusable code**, understanding **functions** and **file handling** in Python. This session emphasized the principle of **modularity**, teaching us how large programs can be divided into smaller, manageable, and reusable blocks of code.

1. **Introduction to Functions:**
   The session began with an overview of Python functions, their purpose, syntax, and how they improve code readability and reusability. The instructor explained **user-defined functions**, their declaration using the def keyword, and how to pass **parameters** and **return values**. Several examples were demonstrated to show how functions make programs easier to debug and maintain.
2. **Practical Implementation:**
   We practiced creating functions that performed tasks like mathematical calculations, string manipulations, and list operations, which helped us understand how to write short, one-line functions useful in data processing and automation workflows.
3. **Scope and Lifetime of Variables:**
   The mentor also discussed the **scope of variables** (local vs global) and their significance in maintaining function integrity. This topic was particularly helpful in understanding how data flows within different parts of a program.
4. **File Handling Operations:**
   In the latter half of the session, we moved to **file input and output (I/O)** operations. We learned how to **open, read, write, and append data** to text files using Python's built-in open() function. Then, we explored how **CSV (Comma-Separated Values) files** are handled in Python using the csv module, learning to read and write structured data efficiently.
5. **Practical Use Case Discussion:**
   The instructor explained how file handling is crucial for real-world projects — especially for tasks like **data logging, report generation**, and **data exchange between platforms**. This knowledge was directly linked to our upcoming projects, such as integrating Google Sheets with n8n, where data storage and retrieval concepts would play a vital role.

This session strengthened our understanding of **function-based programming** and gave us hands-on experience with **persistent data management** techniques, setting the groundwork for working with APIs and automation systems later in the training.

Learning Outcome:
Developed confidence in creating and using user-defined and lambda functions. Gained practical experience in handling files and understanding data persistence, which is essential for automation and external data integration in AI projects.