10. Advanced Python (map(), reduce(), filter(), Closures and Decorators)

Theory:

• How functional programming works in Python.

• Using map(), reduce(), and filter() functions for processing data.

• Introduction to closures and decorators.

Functional programming treats computation as the evaluation of functions and avoids changing state or mutable data. In Python, this can be done using functions like map(), filter(), reduce(), closures, and decorators.

**Key Functions:**

* **map()**: Applies a function to all items in an iterable (like a list) and returns a new iterable with the results.
* **filter()**: Filters out elements from an iterable based on a condition.
* **reduce()**: Cumulatively applies a function to the items of an iterable to reduce it to a single value.