**Experiment: 7**

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**Experiment No**: 7  
**Branch**: Electronics (EN-1)  
**Software Used**: Thonny

**Aim**: Programs to study Python Recursion, Python Modules, Python Package and Python Main functions

**Theory:**

**Python Recursion**

**Recursion** is a programming technique in which a function calls itself to solve smaller instances of the same problem. It is commonly used to solve problems that can be broken down into smaller, similar sub-problems. Each recursive function must have a **base case**, which stops the recursion, and a **recursive case**, where the function continues to call itself. Recursion is often used in problems like factorial calculation, Fibonacci series, and tree traversal. Proper understanding of recursion helps improve problem-solving skills and logical thinking.

**Python Modules**

A **module** in Python is a file containing Python definitions and statements. It allows grouping related code into a single file, making it easier to manage and reuse. Python provides many built-in modules for tasks like math operations, date/time processing, file handling, etc. Users can also create their own modules to organize code better. Modules help in achieving modularity and enhance code reusability and maintainability.

**Python Packages**

A **package** is a way of organizing related Python modules into directories. It is essentially a collection of modules grouped under a common namespace. Each package contains an \_\_init\_\_.py file which makes it recognizable as a Python package. Packages are useful in organizing large projects with multiple modules, providing better structure, and avoiding name clashes. Python’s standard library and third-party libraries often come in the form of packages.

**Python Main Function**

The **main function** concept in Python is implemented using a special conditional check: if \_\_name\_\_ == "\_\_main\_\_". This ensures that certain blocks of code are executed only when the script is run directly and not when it is imported as a module in another script. This feature supports modular programming by separating executable code from reusable code. It is commonly used for testing modules or writing scripts that can be run independently.

Program: