Different types of functions in Python?
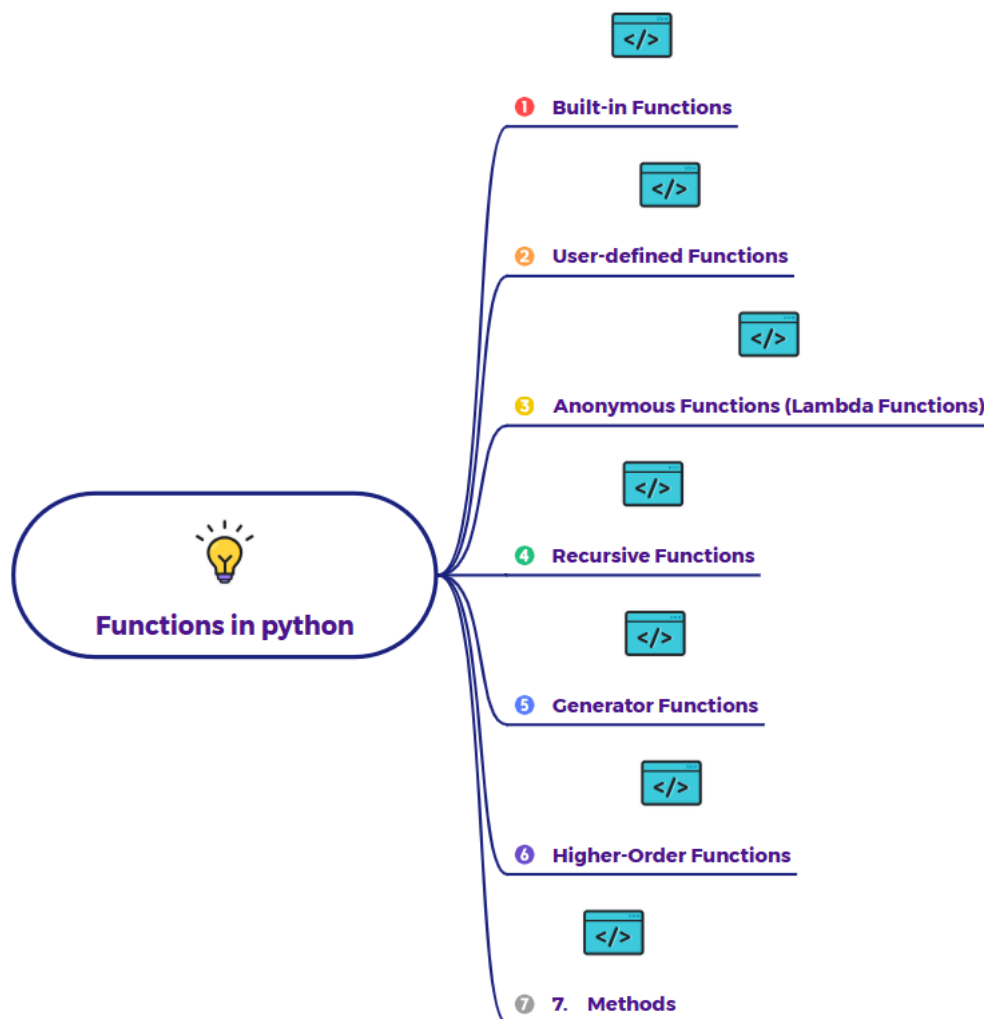

In Python, functions can be categorized in several ways based on their origin, definition, and behavior:

1. **Built-in Functions:**

   - These are functions that are **pre-defined** in Python and are readily available for use without needing to be imported. They perform common tasks efficiently.

   - **Examples:** print(), len(), type(), int(), str(), input(), sum(), max(), min().

2. **User-defined Functions:**

- These are functions that you, the programmer, **create yourself** to perform specific tasks. They allow for code reusability, modularity, and better organization.

- **Defined using:** The def keyword.

3. **Anonymous Functions (Lambda Functions):**

- These are **small, single-expression functions** that are defined without a name. They are typically used for short, throwaway functions, especially as arguments to higher-order functions (like map(), filter(), sorted()).

- **Defined using:** The lambda keyword.

4. **Recursive Functions:**

- These are functions that **call themselves** as part of their execution. They are often used to solve problems that can be broken down into smaller, self-similar sub-problems.

5. **Generator Functions:**

- These are a special type of function that returns an **iterator** (a generator object) that can be iterated over (e.g., in a for loop). They use the yield keyword instead of return to produce a sequence of results one at a time, allowing for memory-efficient iteration over large sequences.

- **Defined using:** The def keyword, but containing yield.

6. **Higher-Order Functions:**

- These are functions that either **take other functions as arguments** or **return a function** as their result. They are a core concept in functional programming.

- **Examples:** map (), filter (), sorted(), functools.reduce().

7. **Methods:**

- While technically a type of function, methods are functions that are **associated with an object or a class**. They operate on the data within that object/class.

- **Defined within:** A class definition.