



EMBA Program
MB-511

Data Science for Managerial Decisions (MB 511)

Instructor
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Functions in Python

Functions are an essential component in Python, providing structure and modularity to a program. A function in Python is a reusable block of code that is used to perform a specific action. It takes inputs, processes them, and may return an output, allowing us to avoid repetition and make our code cleaner and more maintainable.

Purpose and Benefits of Functions

Functions serve multiple purposes in Python programming:

- **Modularity:** By breaking a complex problem into smaller, manageable functions, we can focus on one aspect of the problem at a time.
- **Code Reusability:** Once a function is defined, it can be called multiple times, avoiding code repetition.
- **Maintainability:** If a function needs to be updated, you can modify it once in its definition, and all calls to the function will reflect the change.
- **Debugging:** Since functions encapsulate specific tasks, they help isolate bugs and issues within small blocks of code, making debugging easier.



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Defining a Function

A Python function is defined using the `def` keyword, followed by a function name and parentheses that may contain parameters. A simple structure is as follows:

```
def function_name(parameters):
```

```
    # function body
```

```
    return [expression]
```

- The `def` keyword marks the start of the function definition.
- The function name is followed by parentheses, which may hold parameters.
- The function body contains the logic or operations that the function performs.
- **Optionally**, a return statement can be used to send a result back to the caller.



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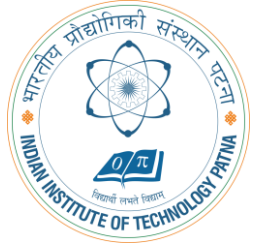


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Libraries in Python

Python libraries are collections of pre-written modules or functions that provide functionality for various tasks without the need to write code from scratch. These libraries are a critical part of Python's ecosystem and have contributed significantly to the language's widespread adoption across different domains, including data science, web development, machine learning, and automation.

A library in Python can be as small as a single module or as large as an entire framework. The primary advantage of using libraries is code reuse. Libraries save time and effort by allowing developers to leverage existing, well-tested solutions to common problems. Whether it's mathematical computations, data visualization, or working with APIs, there is likely a Python library designed to make the task easier.



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Libraries in Python

Types of Python Libraries

Python libraries can generally be divided into two categories:

Standard Libraries: These come pre-installed with Python and cover many fundamental tasks such as file I/O, date/time manipulations, math operations, and more.

Common examples include:

math: Provides mathematical functions.

os: Allows interaction with the operating system.

datetime: Deals with date and time manipulation.

Third-Party Libraries:

These are developed by the Python community and can be installed using Python's package manager, pip. **Examples include:**

NumPy: For numerical computations, especially when dealing with large arrays or matrices.

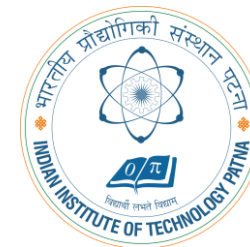
pandas: For data manipulation and analysis, especially useful for tabular data.

matplotlib: For data visualization through graphs and charts.

requests: Simplifies making HTTP requests for web scraping or working with APIs.



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Have a question?

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