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## Lambda Function in Python

### Lambda Function in Python

What is a Lambda Function in Python?

A lambda function is a small, anonymous function – meaning it doesn't have a name like normal functions created using def.

It is mainly used when you need a simple, short function for quick calculations.

#### Syntax of Lambda Function

lambda arguments : expression

#### Explanation:

- lambda → keyword used to define the function
- arguments → inputs (like parameters in normal functions)
- expression → a single line of code that gets evaluated and returned automatically

**NOTE:** Lambda functions can only have one expression, not multiple statements or loops.

#### Solved Example 1 - Basic Lambda Function

```
square = lambda x: x * x  
print(square(5))
```

#### Output:

25

#### Explanation:

Here, lambda x: x \* x creates a function that takes one argument x and returns its square.

It's similar to:

```
def square(x):  
    return x * x
```

#### Solved Example 2 - Lambda Function with Two Arguments

```
add = lambda a, b: a + b  
print(add(5, 3))
```

#### Output:

8

#### Explanation:

This lambda takes two arguments (a and b) and returns their sum.



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**Solved Example 3 - Using Lambda with map()**  
map() applies a function to every element of a list.  
numbers = [1, 2, 3, 4, 5]  
squares = list(map(lambda x: x \* x, numbers))  
print(squares)

**Output:**  
[1, 4, 9, 16, 25]

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**Explanation:**  
Here, the lambda function is applied to each element of numbers to get their squares.

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**Solved Example 4 - Using Lambda with filter()**  
filter() selects elements from a list that meet a condition.  
numbers = [10, 25, 30, 45, 60]  
greater\_than\_30 = list(filter(lambda x: x > 30, numbers))  
print(greater\_than\_30)

**Output:**  
[45, 60]

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**Explanation:**  
The lambda checks which numbers are greater than 30 and returns only those.

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**Solved Example 5 - Using Lambda with sorted()**  
students = [("John", 20), ("Anita", 18), ("Ravi", 22)]  
sorted\_students = sorted(students, key=lambda x: x[1])  
print(sorted\_students)

**Output:**  
[('Anita', 18), ('John', 20), ('Ravi', 22)]

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**Explanation:**  
The lambda tells Python to sort the list by age (2nd value) of each tuple.

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**When to Use Lambda Functions**

Use lambda functions when:

- You need a **short, one-time-use** function
- You are working with **functions like map(), filter(), reduce(), or sorted()**
- You want to make your code **compact and readable**

NOTE: Avoid using lambda functions for long or complex logic – use normal def functions instead.

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Quick Comparison

Task	Normal Function	Lambda Function
Add two numbers	def add(a, b): return a + b	lambda a, b: a + b
Square a number	def sqr(x): return x**2	lambda x: x**2
Multiply numbers in list	map(def multiply, list)	map(lambda x: x*2, list)

Assignment

- Q1. Write a Python program using a lambda function to find the cube of a number.
- Q2. Use a lambda function to add two numbers given by the user.
- Q3. Using map() and lambda, multiply every number in the list by 10.
- Q4. Use filter() with a lambda function to get even numbers from a list.

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