Lambda Function

Lambda Function

- A **lambda function** in Python is a small, **anonymous** function defined using the **lambda** keyword.
- It can take **any number of arguments**, but it must have **only one expression** — no multiple lines or code blocks.
- It is commonly used for short, **one-time** (throwaway) functions.
- Lambda functions are limited to a **single expression** – no statements like **for**, **while**, or **print()** are allowed.

  (However, expressions like **x if condition else y** are allowed.)

Python

```python
lambda argument: expression
```

- **lambda:** is the keyword
- **arguments:** can be one or more inputs
- **expression:** is a single expression evaluated and returned

Lambda Function - Example

def	**Lambda**

`def square(x):`
`    return x ** 2`
 	
`print(square(5))`
	`square = lambda x: x ** 2`
	
	`print(square(6))`

Output	**Output**
25	36

Lambda vs def

Feature	lambda Function	def Function
Name	Anonymous (can be assigned to a name)	Named explicitly
Syntax	Single-line expression	Multi-line body
Return statement	Implicit (always returns the result of expr)	Uses return keyword
Use case	Simple, short functions	Complex logic, multiple statements
Readability	Less readable for complex logic	More readable for full logic
Functionality	Cannot have loops, conditions, etc. inside	Can do almost anything

Example - 1

No Arguments

Python

```python
say_hello = lambda: "Hello!"
print(say_hello())
```

Output

```
Hello!
```

Example - 2

Basic Usage

Python

```python
x = lambda a : a + 10
print(x(5))
```

Output

```
15
```

Example - 3

Lambda with multiple arguments

Python

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

Output

```
8
```

Example - 4

Lambda with Conditional Expression

Python

```python
max_func = lambda a, b: a if a > b else b
print(max_func(4, 7))
```

Output

```
7
```

Example - 5

Lambda Inside Functions

Python

```python
def make_multiplier(n):
    return lambda x: x * n
double = make_multiplier(2)
print(double(5))
```

Output

```
10
```

Example - 6

Lambda in Dictionary

Python

```python
operations = {
    'add': lambda x, y: x + y,
    'sub': lambda x, y: x - y
}
print(operations['add'](5, 3))
```

Output

```
8
```

Example - 7

Lambda with sorted()

Python

```
points = [(2, 3), (1, 2), (5, 1)]
sorted_points = sorted(points, key=lambda x: x[1])
print(sorted_points)
```

Output

```
[(5, 1), (1, 2), (2, 3)]
```

Limitations

- Only **one expression** allowed
- Cannot have **multiple statements**
- Can **reduce** code readability if overused
- Can't use **complex control structures** like loops or try-except blocks.

Practice Set - 2

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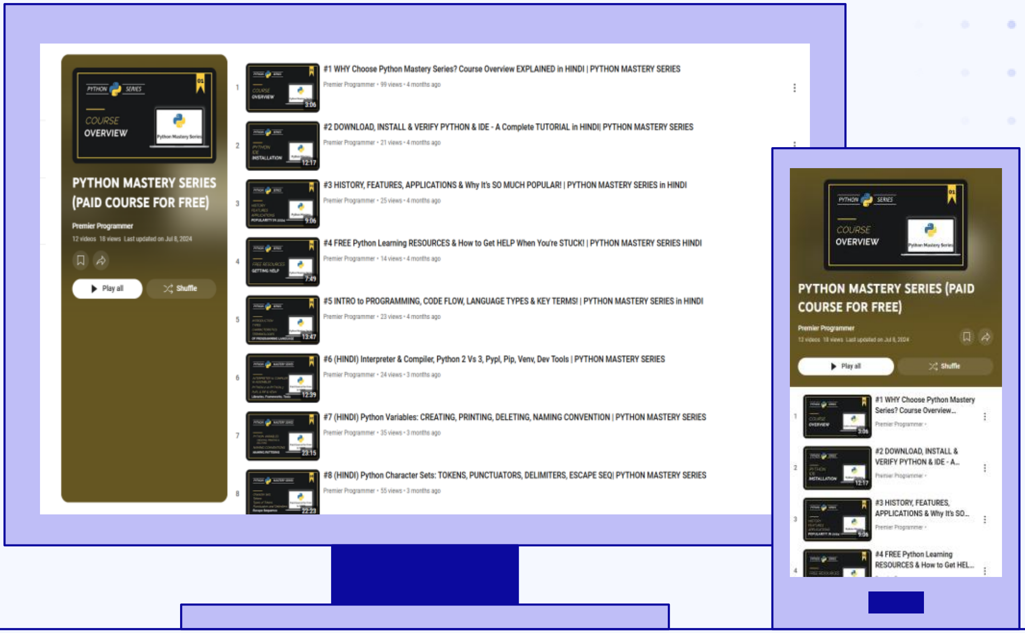

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