



PERIYAR MANIAMMAI

INSTITUTE OF SCIENCE & TECHNOLOGY

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NAME : S Taufiq ahamed

REG NO : 121012012771

SUBJECT : APPLIED AI

SUBJECT CODE : XCSHDO3

DEPARTMENT : B.TECH(CSE)

SEMESTER : 5th sem

LAMBDA FUNCTIONS:

Lambda functions are similar to user-defined functions but without a name. They're commonly referred to as **anonymous functions**.

Lambda functions are efficient whenever you want to create a function that will only contain simple expressions – that is, expressions that are usually a single line of a statement.

Every anonymous function you define in Python will have 3 essential parts:

- ❑ The lambda keyword.
- ❑ The parameters (or bound variables), and
- ❑ The function body.

A lambda function can have any number of parameters, but the function body can only contain one expression. Moreover, a lambda is written in a single line of code and can also be invoked immediately.

Syntax :

The formal syntax to write a lambda function is as given below:

```
lambda p1, p2: expression
```

example :

```
add = lambda x, y: x + y  
print (add (1, 2))
```

The output for the above example is 3.

Code Explanation for above example :

Here, we define a variable that will hold the result returned by the lambda function.

1. The lambda keyword used to define an anonymous function.
2. x and y are the parameters that we pass to the lambda function.

3. This is the body of the function, which adds the 2 parameters we passed. Notice that it is a single expression. You cannot write multiple statements in the body of a lambda function.

4. We call the function and print the returned value.

DEF PACKAGES AND MODULES:

In Python, both modules and packages organize and structure the code but serve different purposes.

In simple terms, a module is a single file containing python code, whereas a package is a collection of modules that are organized in a directory hierarchy.

modules :

In Python, a module is a single file containing Python definitions and statements. These definitions and statements can include variables, functions, and classes and can be used to organize related functionality into a single, reusable package. Module organizes and reuses code in Python by grouping related code into a single file.

Modules can be imported and used in other Python files using the **import** statement.

Some popular modules in Python are math, random, csv, and datetime.

Example:

Consider a Python module `math.py` that contains a function to calculate the square of a number.

```
#math.py module
```

```
def square(i):
```

```
    return x**2
```

This module can be used be imported and used in the different files as follows:

```
#main.py file
```

```
import math
```

```
print(math.square(5))
```

The output for the above code is 25.

Packages :

Python Packages are collections of modules that provide a set of related functionalities, and these modules are organized in a directory hierarchy. In simple terms, packages in Python are a way of organizing related modules in a single namespace.

- ❑ Packages in Python are installed using a package manager like `pip` (a tool for installing and managing Python packages).
- ❑ Each Python package must contain a file named `_init_.py`.

Example :

Let there be any package (named my_package) that contains two sub-modules (mod_1, and mod_2)

my_package/

init.py

mod_1.py

mod_2.py

Note:

init.py file is required to make python treat the dictionary as a package.

MATRIX DIVISION:

For matrices, there is no such thing as division. You can add, subtract, and multiply matrices, but you cannot divide them. There is a related concept, though, which is called “inversion” .but we can perform division operation in array.

Python's numpy. divide() computes the element-wise division of array elements. The elements in the first array are divided by the elements in the second array.

SYNTAX :

numpy.divide(arr1, arr2, out = None, where = True, casting = 'same_kind' , order = ' K' , dtype = None) :

Array element from first array is divided by elements from second element (all happens element-wise). Both arr1 and arr2 must have same shape and element in arr2 must not be zero; otherwise it will raise an error.

EXAMPLE 1 FOR (arr1 divide by arr2 elements):

```
# Python program explaining
```

```
# divide() function
```

```
import numpy as np
```

```
# input_array
```

```
arr1 = [2, 27, 2, 21, 23]
```

```
arr2 = [2, 3, 4, 5, 6]
```

```
print ("arr1          :", arr1)
```

```
print ("arr2          :", arr2)
```

```
# output_array
```

```
out = np.divide(arr1, arr2)
```

```
print ("\nOutput array : \n", out)
```

OUTPUT FOR THE EXAMPLE 1:

arr1 : [2, 27, 2, 21, 23]

arr2 : [2, 3, 4, 5, 6]

Output array :

[1. 9. 0.5 4.2 3.83333333]

EXAMPLE 2 FOR (elements of arr1 divided by divisor):

```
# Python program explaining
```

```
# divide() function
```

```
import numpy as np
```

```
# input_array
```

```
arr1 = [2, 27, 2, 21, 23]
```

```
divisor = 3
```

```
print ("arr1      : ", arr1)
```



```
# output_array  
out = np.divide(arr1, divisor)  
print ("\nOutput array : \n", out)
```

OUTPUT FOR THE ABOVE EXAMPLE 2:

```
arr1      : [2, 27, 2, 21, 23]
```

Output array :

```
[ 0.66666667  9.      0.66666667  7.      7.66666667]
```