

LAB#03

Artificial Intelligence
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Lab Objectives

Tuple

Dictionaries

Functions

Numpy Library

Tuple

- Tuples is collection of objects like list in python
- Unlike lists tuples are immutable
- Whenever you want to create a collection that shouldn't change you should go for tuples

Tuple Objectives

- Creating a tuple
- Accessing elements of a tuple
- Trying to update tuple
- Removing elements from a tuple
- Checking if a value exists in tuple
- Traversing a tuple

Dictionary

- It is a key value pair
- Each key value pair is called an item
- Dictionaries are mutable
- These provide fast lookup in $O(1)$ time

Dictionary Objectives

- Creating elements in dictionary
- Accessing elements from a dictionary
- Updating elements of a dictionary
- Adding new elements
- Removing elements from a dictionary
- Checking if a key exists
- Getting keys and values
- Merging Dictionaries

Functions

- Function is a block of code, which takes certain input (arguments may not be necessary) processes it and produces some output (print or return)
- Functions provide modularity and reusability

Function Objectives

- Defining and calling functions
- Function Arguments
- Return Values from a function
- Global keyword

LAB TASKS

- TASK 01: Create a function which takes tuples of tuples as input (containing at least 7 tuples), where each tuple contains: name and age of a person, this function returns a new tuple which contains only the names of those persons whose age is greater than 20
- TASK 02: Create a function which takes a number as input and determines two things:
 - Whether the number is even/odd
 - Greater than 5, as a bool

LAB TASKS

- TASK 03: Create a function which stores the information about books in Library:
 - Each book has title,author,publication year and genre
 - Use a dictionary to store information about the books
 - Where keys are the book titles
 - Values are title,author,publication year and genre as a tuple
 - Write Separate functions for:
 - Searching a book and display it's information
 - Adding a new book
 - Deleting a book with given key

Numpy Library

- In Python we have lists that serve the purpose of array
 - But being heterogenous these are slow to process
- Numpy provides an array object that is 50x faster in processing than the lists:
 - Array object is called ndarray

Numpy Objectives

- Creating Numpy arrays
- Array Operations
- Array Manipulations
- Advanced Topics

Broadcasting

- Numpy allows operations on arrays of different shapes with certain constraints

```
>>> import numpy as np
>>> a = np.array([1.0, 2.0, 3.0])
>>> b = np.array([2.0, 2.0, 2.0])
>>> a * b
array([2., 4., 6.])
```

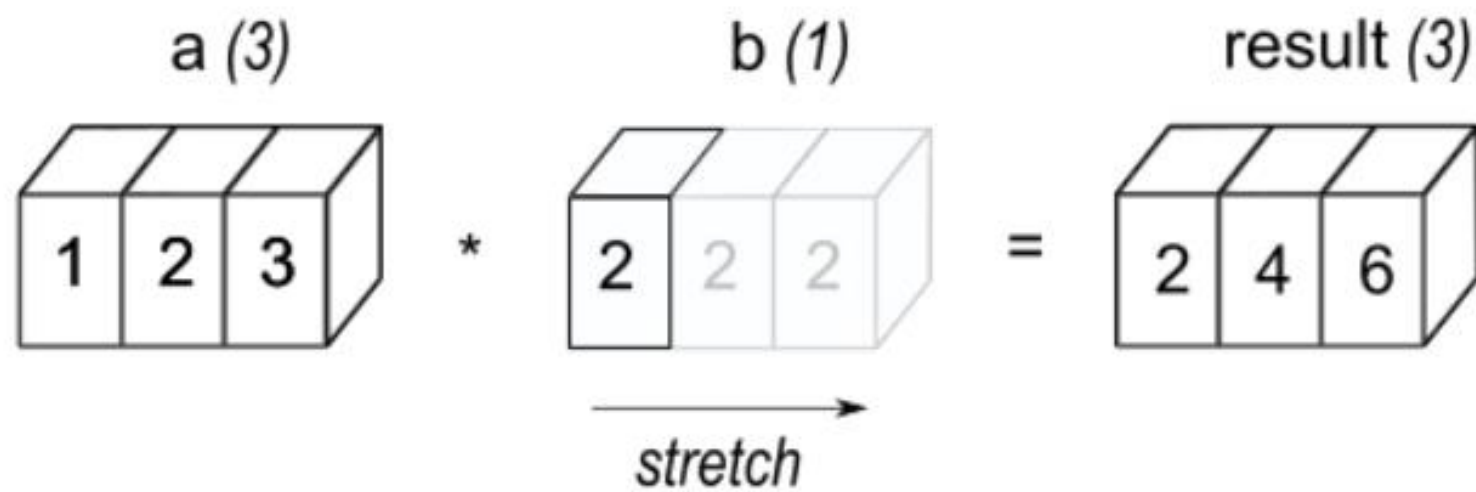


Figure 1