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Subject : Prog for AI

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ASSIGNMENT # 02

Q:-1 Explain the concept of zip() function in python with example.

Ans Zip() function:

The zip() function in python is used to ~~comp~~ combine ~~two~~ ~~or~~ or more iterables (list, tuples, etc) element-wise into tuples. It returns an iterator of tuples where the i-th tuple contains the i-th element from each of the input iterables. If the input iterables are of different length, zip() stops when the shortest iterable is exhausted.

Example:

Code:

```
l1 = [1, 2, 3]
l2 = ['a', 'b', 'c']
zipped = zip(l1, l2)
zlist = list(zipped)

print(zlist)
```

Output:

```
[(1, 'a'), (2, 'b'), (3, 'c')]
```

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Q:-2 Explain the concept of: defaultdict in python with example.

Defaultdict:

In python, 'defaultdict' is a subclass of the built-in 'dict' class. It's a dictionary-like container that provides a default value for each key. This means that if you try to access a key that doesn't exist, it will not raise a 'KeyError' like a standard dictionary would. Instead, it will create the key and assign it a default value specified by the user.

defaultdict is particularly useful when dealing with scenarios where you need to initialize dictionary values with specific default types, especially for counting occurences or grouping items.

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Q.-3 Output & 1 line explanation of the following codes.

Ans i. Output:

{'a':1, 'b':2, 'c':3}

Explain:

The code creates a dictionary where keys are elements from the 'keys' list and values are elements from the 'values' list, using dictionary comprehension along with the 'zip()' function.

ii. Output:

{'banana':7, 'date':10}

Explain:

This code create a new dictionary with fruits having a quantity greater than 5 by filtering the original dictionary.

iii. Output:

(1, 2, 3)
('one', 'two', 'three')

Explain:

This code take a list of tuples containing pairs of numbers are their words, then use "zip(*pairs)" to separate the numbers and words into two separate lists, and finally print out these two lists.

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iv. Output:

[('Alice', 85), ('Bob', 92), ('Charlie', 78)]
<zip object at 0x785bb5df2c00>
{'Alice': 85, 'Bob': 92, 'Charlie': 78}

Explain:

The code zips elements from list into tuples, converts them to a dictionary and prints the result.

v. Output:

defaultdict(<class 'list'>, {'fruit': ['apple', 'banana', 'grape'], 'vegetable': ['carrot', 'celery']})

[]
<class 'collections.defaultdict'>

Explain:

The code builds a dictionary with items grouped by category, test for a missing category, and verifies its type.

vi. Output:

{'a', 'c', 'd', 'h'}

Explain:

This python code concisely extracts the first letters of each word in a list using set comprehension and prints the unique letter set.

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vii. Output:

{1, 2, 3, 4, 5, 6, 7}

Explain:

The code efficiently combines unique elements from multiple sets into a single set using set comprehension.

viii. Output:

{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

Explain:

This code combines three unique sets into a single ~~set~~ set ~~containg~~ containing all distinct elements.

ix. Output:

{4, 5}

Explain:

This code defines sets, users set comprehension, to find elements in ~~both,~~ both, and stores the intersection in a set for printing.

x. Output:

(2, 3, 4)

Explain:

This code prints a slice of tuple starting from index 1 (inclusive) and ending at index 4 (exclusive), so it prints elements 2, 3 & 4 from the tuple.