Python Data Structures - Practice Questions with Sample Input and Output

List – Practice Questions with Sample Input and Output

1. Remove duplicate entries from a list of student names.

Sample Input:

students = ["Alice", "Bob", "Alice", "David", "Bob"]

Expected Output:

["Alice", "Bob", "David"]

2. Reverse the order of a list of recently opened files.

Sample Input:

recent_files = ["file1.txt", "file2.txt", "file3.txt"]

Expected Output:

["file3.txt", "file2.txt", "file1.txt"]

3. Find the common elements between two lists of tags.

Sample Input:

tags1 = ["python", "ai", "ml"]
tags2 = ["ml", "cloud", "devops"]

Expected Output:

["ml"]

4. Merge two lists of product IDs and remove duplicates.

Sample Input:

ids1 = [101, 102, 103]
ids2 = [102, 104, 105]

Expected Output:

[101, 102, 103, 104, 105]

5. Count how many times each item appears in a shopping cart list.

Sample Input:

cart = ["apple", "banana", "apple", "orange", "banana", "banana"]

Expected Output:

{'apple': 2, 'banana': 3, 'orange': 1}

String – Practice Questions with Sample Input and Output

6. Extract the username and domain from an email address.

Sample Input:

email = "john.doe@example.com"

Expected Output:

Username: john.doe, Domain: example.com

7. Count how many times a word appears in a paragraph.

Sample Input:

text = "AI is the future. AI will change the world. AI is evolving."

Expected Output:

"AI" appears 3 times

8. Replace all phone numbers in a log with 'XXX-XXX-XXXX'.

Sample Input:

log = "Call me at 123-456-7890 or 987-654-3210."

Expected Output:

Call me at XXX-XXX-XXXX or XXX-XXX-XXXX.

9. Check if a given string is a valid palindrome.

Sample Input:

word = "madam"

Expected Output:

It is a palindrome.

10. Format a sentence to title case from mixed cases.

Sample Input:

sentence = "wELCOME to PyTHon proGramming!"

Expected Output:

Welcome To Python Programming!

Set – Practice Questions with Sample Input and Output

11. Find attendees who joined at least one of the two webinars.

Sample Input:

webinar1 = {"Alice", "Bob"}
webinar2 = {"Charlie", "Bob"}

Expected Output:

{"Alice", "Bob", "Charlie"}

12. Identify common skills between two employees using sets.

Sample Input:

skills1 = {"Python", "SQL", "Excel"}
skills2 = {"SQL", "Java"}

Expected Output:

{"SQL"}

13. Check if all required permissions are granted using set comparison.

Sample Input:

required = {"read", "write"}
granted = {"read", "write", "delete"}

Expected Output:

All required permissions are granted.

14. Remove duplicates from a list using sets.

Sample Input:

nums = [1, 2, 2, 3, 1]

Expected Output:

[1, 2, 3]

15. Show items present in one session but not in another.

Sample Input:

session1 = {"A", "B", "C"}
session2 = {"B", "C", "D"}

Expected Output:

{"A"}

Tuple – Practice Questions with Sample Input and Output

16. Store coordinates of cities visited during a road trip.

Sample Input:

coordinates = [(12.97, 77.59), (28.61, 77.20), (19.07, 72.87)]

Expected Output:

[(12.97, 77.59), (28.61, 77.20), (19.07, 72.87)]

17. Create a list of tuples with product name and price.

Sample Input:

products = [("Laptop", 750), ("Mouse", 25)]

Expected Output:

[("Laptop", 750), ("Mouse", 25)]

18. Count how many unique coordinate pairs exist in a dataset.

Sample Input:

coords = [(1,2), (3,4), (1,2), (5,6)]

Expected Output:

3 unique coordinate pairs

19. Unpack tuple values representing a student's marks.

Sample Input:

marks = (85, 90, 95)

Expected Output:

Math: 85, Science: 90, English: 95

20. Use a tuple to store immutable config settings.

Sample Input:

config = ("DEBUG", True, 60)

Expected Output:

Immutable configuration: ("DEBUG", True, 60)

Dictionary – Practice Questions with Sample Input and Output

21. Retrieve employee name using their ID.

Sample Input:

employees = {"E001": "Alice", "E002": "Bob"}

Expected Output:

Name of E001: Alice

22. Count the number of times each character appears in a string.

Sample Input:

word = "balloon"

Expected Output:

{'b': 1, 'a': 1, 'l': 2, 'o': 2, 'n': 1}

23. Create a dictionary of courses and enrolled student counts.

Sample Input:

{"Python": 30, "AI": 20, "ML": 25}

Expected Output:

Python: 30, AI: 20, ML: 25

24. Update product price in a catalog dictionary.

Sample Input:

catalog = {"pen": 10, "pencil": 5}
Update pencil to 6

Expected Output:

{"pen": 10, "pencil": 6}

25. Merge two dictionaries of student marks from two subjects.

Sample Input:

math = {"A": 80, "B": 90}
science = {"A": 85, "C": 88}

Expected Output:

{"A": 85, "B": 90, "C": 88}

Frozenset – Practice Questions with Sample Input and Output

26. Store immutable sets of access rights to use as dictionary keys.

Sample Input:

admin_rights = frozenset(["read", "write", "delete"])

Expected Output:

Used as dictionary key: permissions[admin_rights] = "Admin Access"

27. Compare frozen sets of completed training modules.

Sample Input:

emp1 = frozenset(["AI", "ML"])
emp2 = frozenset(["AI", "DL"])

Expected Output:

Common modules: {"AI"}

28. Store a set of non-editable tags for content classification.

Sample Input:

tags = frozenset(["tech", "ai", "ml"])

Expected Output:

Immutable tags: {"tech", "ai", "ml"}

29. Use frozenset to eliminate duplicates from a list of tuples.

Sample Input:

tuples = [(1, 2), (3, 4), (1, 2)]
frozenset(tuples)

Expected Output:

{(1, 2), (3, 4)}

30. Use frozenset as a cache key in a memoization function.

Sample Input:

key = frozenset(["param1", "param2"])

Expected Output:

Used key to store result in cache dictionary