Python Programming Questions: Data Handling, Comprehension, Iterators, and Grouping

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Q1: Remove duplicates from a list while preserving order.

 # Test Case

nums = [1, 2, 2, 3, 4, 4, 5]

 # Expected Output: [1, 2, 3, 4, 5]

Q2: Convert a list of tuples into a dictionary.

 # Test Case

lst = [(1, 'a'), (2, 'b')]

 # Expected Output: {1: 'a', 2: 'b'}

Q3: Count the frequency of elements in a list.

 # Test Case

lst = ['apple', 'banana', 'apple', 'orange', 'banana']

 # Expected Output: {'apple': 2, 'banana': 2, 'orange': 1}

Q4: Double each element in a tuple and convert to list.

 # Test Case

t = (1,2,3,4,5)

 # Expected Output: [2, 4, 6, 8, 10]

Q5: Filter dictionary items with value greater than 10.

 # Test Case

data = {'a': 5, 'b': 15, 'c': 25}

 # Expected Output: {'b': 15, 'c': 25}

Q6: Create a set of squares of odd numbers from 1 to 20.

 # Expected Output: {1, 9, 25, 49, 81, 121, 169, 225, 289, 361}

Q7: Flatten a list of lists.

 # Test Case

lst = [[1,2], [3,4], [5]]

 # Expected Output: [1, 2, 3, 4, 5]

Q8: Map elements of one list to the square of elements of another.

 # Test Case

keys = ['a', 'b', 'c']

values = [1, 2, 3]

 # Expected Output: {'a': 1, 'b': 4, 'c': 9}

Q9: Create an iterator for even numbers from 2 to 20 and print first 5.

 # Expected Output: 2, 4, 6, 8, 10

Q10: Generate Fibonacci numbers up to n.

 # Test Case

n = 20

 # Expected Output: [0, 1, 1, 2, 3, 5, 8, 13]

Q11: Generate all 2-length combinations of a list.

 # Test Case

lst = [1,2,3,4]

 # Expected Output: [(1,2), (1,3), (1,4), (2,3), (2,4), (3,4)]

Q12: Select all elements greater than 10 from a list.

 # Test Case

lst = [5,12,7,20,15,3]

 # Expected Output: [12, 20, 15]

Q13: Select keys from a dictionary whose values are unique.

 # Test Case

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

 # Expected Output: {'a': 1, 'd': 3}

Q14: Sort a set of numbers in descending order.

 # Test Case

s = {5, 2, 9, 1}

 # Expected Output: [9, 5, 2, 1]

Q15: Replace negative numbers in a list with 0.

 # Test Case

lst = [1,-2,3,-4,5]

 # Expected Output: [1, 0, 3, 0, 5]

Q16: Increment all dictionary values by 5.

 # Test Case

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

 # Expected Output: {'a': 6, 'b': 7, 'c': 8}

Q17: Group numbers in a list into 'even' and 'odd'.

 # Test Case

lst = [1,2,3,4,5,6]

 # Expected Output: {'even': [2,4,6], 'odd': [1,3,5]}

Q18: Categorize words by their length.

 # Test Case

words = ['apple','bat','cat','banana']

 # Expected Output: {5: ['apple'], 3: ['bat', 'cat'], 6: ['banana']}

Q19: Group students by grade.

 # Test Case

students = [{'name':'A','grade':'X'}, {'name':'B','grade':'Y'}, {'name':'C','grade':'X'}]

 # Expected Output: {'X': ['A','C'], 'Y': ['B']}

Q20: Find maximum score per name from a list of tuples.

 # Test Case

data = [('A', 10), ('B', 15), ('A', 20), ('B', 5)]

 # Expected Output: {'A': 20, 'B': 15}