100+ Python Coding Questions for Data Scientist Roles

1. Reverse a string.
2. Check if a string is a palindrome.
3. Find the first non-repeating character in a string.
4. Check if two strings are anagrams.
5. Find duplicate elements in a list.
6. Remove duplicates from a list without using set.
7. Find the largest and smallest numbers in a list.
8. Sort a list without using built-in sort functions.
9. Flatten a nested list.
10. Count the occurrences of each element in a list.
11. Reverse the words in a sentence.
12. Capitalize the first letter of each word in a string.
13. Check if a string contains only digits.
14. Find all substrings of a string.
15. Find the longest common prefix.
16. Count vowels and consonants in a string.
17. Replace multiple spaces with a single space in a string.
18. Find the longest palindrome substring.
19. Check if two strings are rotations of each other.
20. Remove characters from the first string that are present in the second string.
21. Rotate an array by k positions.
22. Find the second-largest number in a list.
23. Move all zeroes to the end of the list.
24. Find the missing number in a list of 1 to N.
25. Merge two sorted arrays.
26. Find the intersection of two lists.
27. Find the union of two lists.
28. Check if an array can be split into two parts with equal sum.
29. Find the majority element in an array.
30. Find the maximum product of three numbers.

31. Count word frequency in a string.
32. Group anagrams from a list of words.
33. Find the top K frequent elements in a list.
34. Check if two dictionaries are equal.
35. Merge two dictionaries.
36. Invert keys and values in a dictionary.
37. Convert two lists into a dictionary.
38. Sort dictionary by values.
39. Find common keys in two dictionaries.
40. Create a nested dictionary dynamically.
41. Implement binary search.
42. Implement linear search.
43. Find factorial using recursion.
44. Find Fibonacci sequence up to n.
45. Implement quicksort.
46. Implement merge sort.
47. Solve the Tower of Hanoi problem.
48. Find GCD and LCM of two numbers.
49. Detect cycles in a linked list.
50. Find the kth largest element in an array.
51. Transpose a matrix.
52. Rotate a matrix 90 degrees.
53. Print a matrix in spiral order.
54. Search an element in a sorted matrix.
55. Find the maximum sum submatrix.
56. Find diagonal elements sum in a square matrix.
57. Set entire row and column to zero if an element is zero.
58. Check if a matrix is symmetric.
59. Find the shortest path in a grid (using BFS).
60. Check if a Sudoku solution is valid.
61. Merge two dataframes on a key column.
62. Filter rows based on a column condition.
63. Group data by a column and calculate aggregate metrics.

64. Replace missing values with the mean.
65. Create a new column based on conditions.
66. Sort dataframe by multiple columns.
67. Drop duplicate rows in a dataframe.
68. Pivot a dataframe.
69. Convert string column to datetime.
70. Find correlation between two columns.
71. Create a random matrix of given shape.
72. Perform element-wise multiplication of arrays.
73. Calculate row-wise and column-wise means.
74. Reshape a 1D array to 2D.
75. Find unique values in an array.
76. Stack arrays horizontally and vertically.
77. Invert a matrix.
78. Create an identity matrix.
79. Find eigenvalues of a matrix.
80. Normalize a numpy array.
81. Implement a stack using a list.
82. Implement a queue using collections.deque.
83. Reverse a linked list.
84. Detect cycle in a linked list.
85. Find middle element of a linked list.
86. Merge two sorted linked lists.
87. Implement a Min Stack.
88. Implement LRU Cache.
89. Convert a binary tree to a doubly linked list.
90. Find the height of a binary tree.
91. Explain shallow copy vs deep copy with examples.
92. Explain list comprehension with examples.
93. What are Python decorators? Create a simple decorator.
94. Explain Python generators with examples.
95. Explain lambda functions with examples.
96. Explain the difference between @staticmethod and @classmethod.

97. What is the Global Interpreter Lock (GIL)?

98. What are Python iterators and how do they work?

99. Write a context manager using 'with'.

100. Explain and implement memoization.