**Python Technical Interview Prep (4 Pages)**

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* Concepts
* Abstract class
* Collections
* OOPS
* when to use notify and when to use notify all
* Hash Tables/Maps
* Databases
* Concurrency
* Data structures
* Binary trees
* Queries
* Initializing
* Thread synchronization.
* Daemon threads
* Static methods
* SQL Queries
* Multi-threading
* Distributed Computing
* Performance, Data Structuring etc.
* Here are the questions they asked (please note some questions where asked to java candidates so if it doesn’t match your background, disregard):
* Probability
* Synchronize HashMap
* Garbage Collection
* Definition of key word in synchronization
* Arraylist vs Linkedlist
* Networks: what's the difference between TCP and UDP?
* How does a HashMap work?
  + How to make sure a hashmap is threadsafe if multiple readers and writers have access to it?

1. What are the key features of Python?
   1. Easy to learn and use
   2. Dynamic typing
   3. Dynamic memory allocation
   4. Provides backend support in full stack development
   5. GUI support
   6. Object oriented programming, abstraction, etc.
   7. Integrated language, lines execute one-by-one. No need to compile like C and C++ so it’s portable as well
2. Mention five benefits of using Python?
   1. Extensive list of libraries for data analysis like pandas, numpy, scikit learn, matplotlib, seaborn
   2. Machine learning libraries like keras, tensorflow, etc.
   3. Web scraping
   4. Web applications
   5. Memory management, and typing
   6. GUI support – tkinter
3. Mention the use of the split function in Python?
   1. It takes a delimiter and splits a string into a list of substrings breaking on that delimiter. Default is space.
4. Compare Java & Python
   1. Python:
      1. Easy to use and read
      2. Slower as it’s dynamically typed
      3. Used for scripting, large-scale data processing, data science, machine learning
      4. Good for agile development
   2. Java
      1. Syntax is a bit strict, Requiring parenthesis for conditions and semicolons
      2. Faster than python
      3. Support for multi-threading
      4. Mostly used for android development
      5. Self-memory management
5. What are the supported data types in Python?
   1. Int
   2. Float
   3. complex
   4. str
   5. bool
   6. dict
   7. tuple
   8. list
   9. None
6. How is memory managed in Python?
7. Whenever Python exits, why isn’t all the memory de-allocated?
8. What is dictionary in Python?
9. What is a Python module?
10. How do you perform pattern matching in Python
11. What is the difference between list and tuples?
12. What is the difference between deep and shallow copy?
13. How is Multithreading achieved in Python?
14. How can the ternary operators be used in python?
15. How is memory managed in Python?
16. Explain Inheritance in Python with an example.
17. Explain what Flask is and its benefits?
18. What is the usage of help() and dir() function in Python?
19. Whenever Python exits, why isn’t all the memory de-allocated?
20. What is dictionary in Python?
21. What is monkey patching in Python?
22. What does this mean: \*args, \*\*kwargs? And why would someone use it?
23. Write a one-liner that will count the number of capital letters in a file. Your code should work even if the file is too big to fit in memory.
24. What are negative indexes and why are they used?
25. How can you randomize the items of a list in place in Python?
26. What is the process of compilation and linking in python?
27. Write a sorting algorithm for a numerical dataset in Python.
28. Explain split(), sub(), subn() methods of “re” module in Python.
29. How can you generate random numbers in Python?
30. What is the difference between range & xrange?
31. What is pickling and unpickling?
32. Mention the differences between Django, Pyramid and Flask.
33. Discuss the Django architecture.
34. Explain how you can set up the Database in Django.
35. Give an example how you can write a VIEW in Django?
36. Mention what the Django templates consists of.
37. Explain the use of session in Django framework?
38. List out the inheritance styles in Django.
39. What is map function in Python?
40. How to get indices of N maximum values in a NumPy array?
41. How do you calculate percentiles with Python/ NumPy?
42. What advantages do NumPy arrays offer over (nested) Python lists?
43. Explain the use of decorators.
44. What is the difference between NumPy and SciPy?
45. How do you make 3D plots/visualizations using NumPy/SciPy?
46. Which of the following statements create a dictionary? (Multiple Correct Answers Possible)
47. Which one of these is floor division?
48. What is the maximum possible length of an identifier?
49. Why are local variable names beginning with an underscore discouraged?
50. Suppose list1 is [2, 33, 222, 14, 25], What is list1[-1] ?
51. To open a file c:\scores.txt for writing, we use
52. What is the output of the following?
53. When will the else part of try-except-else be executed?
54. Write a sorting algorithm for a numerical dataset in Python.
55. How will you reverse a list?
56. How will you remove last object from a list?
57. What are the built-in type does python provides
58. What is namespace in Python?
59. How you can convert a number to a string?
60. You are having multiple Memcache servers running Python, in which one of the memcacher server fails, and it has your data, will it ever try to get key data from that one failed server?
61. Explain how you can minimize the Memcached server outages in your Python Development?
62. Explain how Memcached should not be used in your Python project?
63. Explain what is Dogpile effect? How can you prevent this effect
64. What is an algorithm?
65. What is time complexity of Binary Search?
66. Can Binary Search be used for linked lists?
67. How to find if two given rectangles overlap?
68. How to find angle between hour and minute hands at a given time?
69. When does the worst case of QuickSort occur?
70. Given a big string of characters, how to efficiently find the first unique character in it?
71. How to count inversions in a sorted array?
72. Given a big array, how to efficiently find k’th largest element in it?
73. Given an array of size n with range of numbers from 1 to n+1. The array doesn’t contain any duplicate, one number is missing, find the missing number.
74. How to write an efficient method to calculate x raise to the power n?
75. Given an input string and a dictionary of words, find out if the input string can be segmented into a space-separated sequence of dictionary words.
76. You are given an array of sorted words in an arbitrary language, you need to find order (or precedence of characters) in the language.
77. What is a Data Structure?
    1. What are linear and non linear data Structures?
78. What are the various operations that can be performed on different Data Structures?
79. How is an Array different from Linked List?
80. What is Stack and where it can be used?
81. What is a Queue, how it is different from stack and how is it implemented?
82. What are Infix, prefix, Postfix notations?
83. What is a Linked List and What are its types?
84. Which data structures are used for BFS and DFS of a graph?
85. Can doubly linked be implemented using a single pointer variable in every node?
86. How to implement a stack using queue?
87. How to implement a queue using stack?
88. Which Data Structure Should be used for implementiong LRU cache?
89. How to check if a given Binary Tree is BST or not?
90. Linked List Questions
91. Tree Traversal Questions
92. Convert a DLL to Binary Tree in-place
93. Convert Binary Tree to DLL in-place
94. Delete a given node in a singly linked list
95. Reverse a Linked List
96. Detect Loop in a Linked List
97. Which data structure is used for dictionary and spell checker?
98. Largest Number formed in the array
99. Find the length of maximum numbers of consecutive numbers jumped up in an array