**Companies Interview Questions And Solutions**

**SAPIENT**

1. **Question – What is the OOPS programming and what is the need to use this concept?**

**Solution -**

1. **Question – What is main OOPS principle. Define with the example of MOBILE?**
2. **Question – What is Serialization? What is the need of serialization?**
3. **Question – What is the use of Inner class? Explain briefly with real time scenarios?**
4. **Question – What is immutable class? Write a program to define custom immutable class?**
5. **Question – What is the Cloning in Java? Write a program to achieve cloning?**
6. **Question – What is the difference between Comparator and Comparable in java? Write a program to compare Employee List based on Salary then name.**
7. **Question – What are collections used in java?**
8. **Question – Explain the scenarios where I have to use Linked List or ArrayList?**
9. **Question – What is Queue Interface in Java?**
10. **Question – What is Map? How hashmap works in java?**
11. **Question – What is concurrency data structure in java? What is the need of that?**
12. **Question – What is concurrent hash map? How internally it works?**
13. **Question – What is the difference between concurrent hashmap , hashmap, hash table, and synchronized map?**
14. **Question – Write a program to implement efficient hash code and equals method.**
15. **Question – What is thread and use of thread?**
16. **Question – How many ways we can create thread in java?**
17. **Question – What is synchronization?**
18. **Question – What is difference between in hash map and concurrent in java 7 and 8.**
19. **Question – What is locking in thread? What is monitor in thread?**
20. **Question – What is Race condition? Write a program to occur race condition and how to handle it?**
21. **Question – What is deadlock? Create deadlock and fix it?**
22. **Question – What is atomic and volatile in Thread?**
23. **Question – What is Semaphore? Write a program to explain?**
24. **Question – How final variable works in old version of java and new?**
25. **Question – Why wait and notify in object class?**
26. **Question – Write consumer producer problem using wait and notify.**
27. **Question – What is cont down latch? Explain with real time example.**
28. **Question – Write a program to explain fork join?**
29. **Question – What is cyclic barrier? How it is works?**
30. **Question – Write a program to implement custom thread pool.**
31. **Question – What is the use of executor service? Explain with example.**
32. **Question – Write a program to implement lock method in java?**
33. **Question – What is read write lock and reentrant lock in java? Explain with example and uses.**
34. **Question – What is blocking queue and what is the use?**
35. **Question – Write a program to implement custom stack?**
36. **Question – Write a program to implement custom Array List?**
37. **Question – Write a program to implement custom Linked List?**
38. **Question – Write a program to implement custom Binary tree?**
39. **Question – Write a program to implement custom queue using stack?**
40. **Question – Write a program to implement custom stack using queue?**
41. **Question – Write a program to validate expression “{[[(())]]}}”.**
42. **Question – Write a program to implement Singleton design pattern. What is double check in this?**
43. **Question – Explain all design patterns in java with implementation and uses.**
44. **Question – What is Design Principles in Java?**
45. **Question – How memory manage by JVM? What is the role of garbage collector?**
46. **Question – What are the various Garbage collectors?**
47. **Question – What is class loader? Write your own class loader to load the class.**
48. **Question – Write a program to reverse String in various ways.**
49. **Question – Write a program to generate dynamic Fibonacci series.**
50. **Question – Write a program to avoid duplicate from list.**
51. **Question – Write a program to group anagram in the string list.**
52. **Question – Write a program to check pangram? And if it not pangram, what are all characters missing and repeating.**
53. **Question – Write a program to get sequence of character max length and start from index into given String. Example – String s = “aabbbaBccccccCdEeeeeeeeeeeccbaaaa”. Here is the output – start point 16 and length max repeating 10 of ‘e’.**
54. **Question – Write a program to 2nd smallest element in an unsorted array.**
55. **Question – Write a program to 2nd smallest element of sorted rotated array e.g. 5 6 1 2 3 4.**
56. **Question – Write a program to Set of anagrams of list of words. Output should be words which are anagrams from the list should be grouped together**
57. **Minimum distance between 2 words counting the number of characters from middle of both words. E.g. ABC is XYZ and ABC & XYZ are two distinct words . Minimum distance between ABC and XYZ.**
58. **First unique character of a string. aabdcce. Output is b.**
59. **Largest substring with unique characters e.g. aaabcbdeaf output will be cbdeaf.**
60. **Print matrix in spiral form e.g. {{1,2,3}{4,5,6}{7,8,9}} o/p: 1,2,3,6,9,8,7,4,5. Also print reverse and using recursion as well.**
61. **Program to add 2 fractions.**
62. **Largest palindrome in a given string. String = “aabaacccbbbbcccaaxczbc” OP – aacccbbbbcccaa.**
63. **Return element from a pascal triangle – given 5,2 as input . return 2nd element from 5th row.**
64. **Given a string “aabbbbddcc” Find the longest first repeating index and its length. Input aabbbbddcc o/p id {2,4} 2 is index and 4 is the length.**
65. **Arrange given numbers to form the biggest number. Input: list of numbers:{1,34,3,98,9,76,45,4 }.**
66. **Find out the number of pair from given integer array whose sum is equal to a given number**
67. **Find if a given number is Armstrong number - e.g. 371 = 3^3 + 7^3 + 1^3**
68. **Given input. Print the following string. “SSSSSTTPPQ”. o/p : 5S2T2P1Q**
69. **Given node in Binary Search tree, write the implementation for Put Contains and In Order methods.**
70. **Write a method for ATOI functionality (ASCII to Integer conversion) String = “-123” output – -123**
71. **Check if a number is a power of another number.**
72. **Given a set of numbers identify pairs such that a^b = b^a**
73. **Print Even and Odd using 2 thread sequence.**
74. **Sum int array which has length n size using 10 threads.**
75. **Reverse Linked list.**
76. **Find mid element for linked list using time complexity n.**
77. **Find 3rd node from last in linked list with min time complexity.**
78. **Find the loop in linked list.**
79. **Suppose I have two linked list is meeting in one particular node find out the node with min time complexity.**
80. **Find the duplicate character in the string in complexity o(n).**
81. **Find the duplicate integer from int array.**
82. **What is externalization? Explain with example.**
83. **What is the use of Thread Local and how internally it works?**
84. **CopyOnWriteArrayList explain?**
85. **Rejection Policy in thread.**
86. **Thread Dump how to generate and analyse?**
87. **PC Registry?**
88. **Design 2 level car parking?**
89. **Design Restaurant class diagram?**
90. **Describe Java 7 and 8 features.**
91. **In my project I need to load file from older version of JAR. Implement the code to load the class while already new version jars using in class path.**
92. **Write custom iterator.**
93. **Question – What is the size of hashmap if i will give 25.**

**Solution - it will be default 32 greater then next 2^n type.**

1. **Question – How to implement efficient hashcode. Why we are adding prime number during hash code implementation.**
2. **Question – how Hashmap bucket maintaining in java 8 and 7.**
3. **Question – LRU cache - time expiry map**
4. **Question –** **Phone number with state range and while retriving phone number it should return state name based on range.**
5. **Question – quick sort is suit of primitive type (either object is sorted positon then also it will swap in some cases.)**
6. **merge sort is suit on object (swapping is not happing while already sorted.)**
7. **factory design pattern without using if else or switch.**
8. **dependancy inversion - comparator is best example.**

**CTS**

* **Question – What are all the OOPS concept? Elaborate.**
* **Question – What is the difference between abstraction and encapsulation?**
* **Question – What is the difference between interface and abstract class? Which scenario what will be use?**
* **Question – What is the difference between Arraylist and linklist?**
* **Question – What are the difference between ArrayList and LinkedList in Java ?**
* **Question – String class and how to create user define immutable class?**
* **Question – How to work hashmap internally?**
* **Question – What is the difference between List and Set?**
* **Question – Define tree map and internal representation?**
* **Question – Comparable and comparator interface and how to compare objects?**
* **Question – How to sort collection objects?**
* **Question – What is runtime and compile time polymorphism also static polymorphism?**
* **Question – What is the use of hashcode and equals methods? Write implementation.**
* **Question – How to create thread and all the state, what is start and run method in thread?**
* **Question – What is thread pool? How to create thread pool?**
* **Question – Write logic to create hashmap key using Employee object?**
* **Question – How to manage cache in hibernate?**
* **Question – What is IOC in spring? What is dependency injection?**
* **Question – MVC design pattern, singletone design pattern?**
* **Question – How to handle exception in spring?**
* **Question – Write Hibernate configuration and pojo class’s configuration?**
* **Question – Jasper report benefits and how to use it?**
* **Question –**
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**YODLEE**

* **Question – Hash Map , Hash Table,**
* **Question - Linked List and Array List**
* **Question - Reverse String without using loop.**
* **Question - Spring controller**
* **Question - Write custom checked and uncheck exception class**
* **Question - Write to get max occurrence integer inside integer array**
* **Question - Write program to add integer array using 5 thread.**
* **Question - In inheritance in subclass if you decrease access level of method then what is will support**
* **Question - Private🡪 protected**
* **Question - Protected 🡪 default**
* **Question - Default 🡪 protected**
* **Question - Protected🡪 private**
* **Question - Find out the angle between hour and min hand in clock like- 3.15 what will be the angle.**

**HARMAN**

* **String s1 = “a” + “b” + “c”; in this statement how many object will create.**
* **How string pool is working and where string pool memory is available in java.**
* **Class{**
* **Public static print(){**
* **Syso(“Hello”);}**
* **Main(){**
* **A a = new A();**
* **A.print();**
* **a.print();**
* **A a1 = null;**
* **a1.print();**
* **}**
* **What is the output of this program?**
* **Association, Composition and Aggregation in Java**
* **Insert into arraylist element in 4th index.**
* **What is cloning in java explain deep cloning**
* **If A 🡪 reference B, B🡪 reference C and D, A reference K, C🡪 reference F, E, D 🡪 reference E, X,Y,Z and so on many level then how you will make it deep clone.**
* **Can you implement future interface in custom class what is the use of future interface.**
* **Write sql query to find count of emp which is available in particular department.**
* **I have book which can be refer by number of employee, give the name of employee who refer book twice.**
* **Implement comparator and comparable interface?**
* **Implement hashcode and equals method.**

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**Synechron**

* **Write program for push and pop method in Stack data structure.**
* **Find min and max element in stack with time complexity 1.**
* **Filter int arr 0,1,1,0,0,0 in ascending order but time complexity should be n.**
* **Find non repeatable character in string with time complexity 1 space complexity can be anything.**
* **What is fail safe and fail fast.**
* **Make it immutable class.**
* **Write immutable class which return other employee class which you should make is immutable before returning.**
* **How hash map internally work.**
* **Why hashmap storing hashcode with the key value.**
* **How iterator returns fail safe while modify collection duting the iteration time like remove. But normal collect fails.**
* **How concurrent hashmap is fail safe.**
* **What is difference between Executor.execute and executor.submit() method.**
* **Print even and odd number using wait and notify method.**
* **Write and program to return max repeated number of string in string array.**
* **Design the car parking with has 500 car capacity and one side entry and one side exit.**
* **How java 8 features works. Lamda expression.**
* **What is integer cache.**
* **Define garbage collector in java.**
* **What is use of callable interface.**
* **How to auto wire nested class reference in spring.**
* **Write factory design pattern.**
* **What is the difference between get and load in hibernate.**
* **What is the difference in execute and persistence method in hibernate.**
* **Which injection is best in spring.**
* **Injection happen in runtime or compile time.**
* **Write program to find employee name which has max salary with your manager.**
* **How to create views in sql.**
* **Difference between where and having clause in sql.**
* **How linked hash map work.**
* **How semaphore is worked.**
* **What is difference between semaphore and executor thread. Give practical use case.**
* **How to do auto wiring in spring.**
* **What is use of AOP module.**

**Sapient Assignment Basic**

* **What will be your design in the scenario where 250 MB of memory is available to you and 10 file of 100 MB coming from upstream the requirement is to sort these 10 files and save it in database. Which sorting algorithm will you use?**
* **sort each word in those 10 files in alpha-numeric order.**
* **How will you implement producer/consumer problem where there are ten producers and ten consumers.**
* **Implement producer/consumer problem**
* **Using custom blocking queue, join, semaphore and wait/notify.**
* **Implement Merge Sort and Quick Sort. Learn to calculate time and space complexity.**
* **Print Fibonacci series based on provided number.**
* **Implement both recursive and non-recursive approaches. consider using dynamic programming.**
* **Design a Chess Game.**
* **Share design diagram or class diagram.**
* **Design a student management system. Identify which design patterns will be used here.**
* **Sort HashMap by values in descending order using Java 8 Stream APIs.**
* **Write program to find largest and second largest element in an unsorted array.**
* **Program should be scalable enough to find nth largest element.**
* **Implement using Java 8 Stream APIs.**
* **Design a Call Center.**
* **Imagine you have a call center with three levels of employees: fresher, technical lead (TL), product manager (PM). There can be multiple employees, but only one TL or PM. An incoming telephone call must be allocated to a fresher who is free. If a fresher can’t handle the call, he or she must escalate the call to technical lead. If the TL is not free or not able to handle it, then the call should be escalated to PM. Design the classes and data structures for this problem.**
* **Implement custom thread pool.**
* **Handle exceptions, monitor executing threads and implement shutdown mechanism.**
* **Implement custom cyclic brier and custom countdown latch.**
* **Implement Merge Sort using ForkJoin. Learn to calculate time and space complexity.**
* **Design a Custom Concurrent Counter. Don't use AtomicInteger.**
* **Implement custom ReentrantLock.**
* **Design a generic object pool. Identify which design patterns will be used here.**
* **How do you limit number of objects being created in a pool?**
* **Design an multi-threaded Download Manager which can show the progress of different downloads**
* **Design a custom concurrent HashMap using lock splitting concept.**