# Interview Preparation Assessment

## Programming Exercise

1. Write a program to count frequency of characters in a given string and How to get the output of this in insertion order? Write Junit test case for above and in junit method iterate the map and check using junit if the output is correct? Add your custom exception handling for same.
2. Write a code to create a socket connection in Java? Write a Junit test case for same.
3. Write a code to decide the election winner, conditions are-
   1. The candidate who has more alphabets in name would be winner (example – ASHISH SHARMA has 6 alphabets in name which are A, S, H, I, R, M)
   2. The alphabet entered as input are in capital later
   3. We can have multiple elections at the same time so program (input/output) should be design to handle this as well
   4. Unit test cases for all possible scenarios.
4. Write a code to decide largest difference of two number in an array, conditions are-
5. It is an integer array.
6. A[i] < A[J] where i<j

Example: Array = 2, 6, 10, 3, 9 answer is  8

1. Write a code to provide two outputs from an input (an integer array)
2. Have to use an intermediate data structure (collection) say X

Output needed:

* Number of occurrences of an integer in array by using X
* Recreation of initial array by using X
* The program should be justifiable on time/space complexity.

1. Java and Junit code to bubble sort the integer array.
2. Java and Junit code to find the number of occurrences of characters in a String.  Character orders should be maintained.
3. Find repetitive alphabets in  a string. Example: input: aabcdehh output: collection of characters (a,h)
4. Write Java Code to find whether two strings are anagram or not.

In above Code add Custom Exception for all the invalid cases.

Write Junit for the above Code.

1. Write a program to sort Employee based on id or name.

## Problem Solving Exercise

1. **5 Greedy Sons:** There are 5 sons of a man, the man is very wealthy and dies.

All the 5 sons are greedy.

In his will, the man wanted the elder most son to form a proposal for the distribution of the wealth and should be voted by majority including him.

If He is voted out,

The same procedure should be followed by the next elder son.

If He is, also, voted out,

The same procedure should be followed by the next elder son.

And so on.

You have to help the elder most son to form a proposal for which is not voted out.

Remember, the sons are greedy and wants to have as much wealth as possible

1. **25-horses-5-tracks-puzzle:** Mr. John have 25 horses, and he want to pick the fastest 3 horses out of those 25. He has only 5 track that means only 5 horse can run at a time, even he don’t have a stop watch . What is the minimum number of races required to find the 3 fastest horses?
2. There are 100 doors in a row, all doors are initially closed. A person walks through all doors multiple times and toggle (if open then close, if close then open) them in following way:

In first walk, the person toggles every door

In second walk, the person toggles every second door, i.e., 2nd, 4th, 6th, 8th, …

In third walk, the person toggles every third door, i.e. 3rd, 6th, 9th, …

………  
………

In 100th walk, the person toggles 100th door.

**Which doors are open in the end?**

1. 3 boxes have apple, orange and banana, but their labels are incorrect. Please correct labels, you can only open one box to check which fruit is inside.
2. Three ants are sitting at the three corners of an equilateral triangle. Each ant starts randomly picks a direction and starts to move along the edge of the triangle. What is the probability that none of the ants collide?

## Theoretical Questions

1. Why String is immutable in Java and why not others? What can be done to make your own class immutable?
2. What is encapsulation, why we need encapsulation, how to implement encapsulation?
3. Scenario where you have 3 threads sat T1, T2 & T3, where they are doing independent task and you need to start all 3 threads, but T2 is dependent upon T3. How you will make sure that T3 is completed before T2 gets started?
4. Propose a data structure to hold mapping information of location cell with vehicle in a parking lot
5. How to design Class A and Class B?
6. What is Singleton pattern? How to implement your own? What are its main constraints? What are different ways to break singleton nature of the class? Is it better to make whole method synchronized or only critical section synchronized, why?
7. What is the difference between factory and abstract factory pattern?
8. How to write Junit Test case for a multi-threaded application.
9. What is the difference between SOAP and REST web services?
10. How implement a REST Client in java?
11. How to create your own Thread pool in java (using Executor service), advantage and disadvantage of queue cache?
12. Networking question: If a port is blocked by TCP, will that be available for UDP?
13. Checked exception- example.
14. How to convert array to List?
15. Can we modify the List obtained from Arrays.asList(arr) ?
16. Data structure used.
17. What is linked List?
18. Difference between HashMap and HashTable.
19. Difference between LinkedList and HashMap.
20. What will happen if try to add duplicate value in Set.
21. Previous automation experience.
22. Explanation of  JBehave keywords (Given, when, then).
23. How to identify html elements (I used XPath) ?
24. Syntax of selenium method to click the button.
25. What all HTTP methods you used in REST services ?
26. Difference between POST and PUT.
27. Difference between HTTP status code 200 and 201.
28. Difference between HTTP status code 400 and 500.
29. Methods related to Stack in java.
30. Code to create connection for Hibernate.
31. Code to create connection for JDBC.
32. Runtime Polymorphism, focused on method overriding and overloading, with coding.
33. Recursion , Program to get factorial using Recursion with while loop.
34. Program to count words in string with occurrence or each word.
35. Abstract Classes and Interface.
36. Program to Store elements in Map and reverse as per insertion order.
37. Program to write core logic to sort an arrayList.
38. Methods of Collections class and uses.
39. Difference between Comparable and Comparator interface with example.
40. implement a Queue using 2 stacks
41. write a Producer Consumer program
42. Sort the stack by using push and pop functions. Complexity should not be more then O(n). After the program, List down the test scenarios for the scenarios.
43. Given a Sorted array and number; Find a pair of two numbers in the array where sum of two numbers is equal to the given number. Complexity should not be more then O(n).
44. Write a generic Queue<T> using Two stacks; If you can do make it Dqueue. After that write two Junit test cases to test the Queue.
45. Write a Employee class which is sortable by first name and last name in ascending order; Write a Junit test case for the same.
46. Implementation of stack using queue
47. Given an sorted array and number x find the pair of integer which is close to sum of X write junit test case for the same
48. What all automation tools u have used
49. Rest services status codes
50. What you  know about junit and power mockito tools which jars you are using for the same.