CODERPAD PREPARATION

1. Longest uniform string i.e. substring which has the longest repeating letter.
2. Most optimal path problem where you had to reach from bottom left of matrix to top right with adding the elements along the path and reaching the top with maximum. You could either move up or right.
3. the sum of fraction, with simplified output
4. smallest subarray exceeding target sum
5. https://www.geeksforgeeks.org/circle-lattice-points/
6. Question on Graph DFS
7. Find the first non-repeating character in an array.
8. Form the largest possible number from the array of numbers.
9. Given a string, check whether its second half is a palindrome or not (In case of a string of odd length, the second half should be the larger one). (10 marks)
10. Given a binary tree, count the total number of magic parents, where a node which is not NULL and has both left and right children and the sum of the number of nodes in the left subtree is odd and that of the right subtree is even (or sum of nodes in the left subtree as even and right subtree as odd) should be considered as a magic parent. Node 1 is always the Root node. (20 marks)

11. Given a number ‘x’, and a range of ‘y’ to ‘z’. Find the count of all numbers ‘n’ in that range such that the product of the number ‘n’ and ‘x’ does not contain any digit from the number ‘n’. Foreg if x=2, y=11, z=13, then,

- for n=11, 2*11=22 //valid
- for n=12, 2*12=24 //invalid as 24 contains 2 from n=12
- for n=13, 2*13=26 //valid

therefore, count=2 (https://www.geeksforgeeks.org/count-numbers-in-range-such-that-digits-in-it-and-its-product-with-q-are-unequal/)

12. A man is travelling from city A to city B. He starts with X amount of money. Everyday he spends some money and also he may work on some days to earn money. He may earn more than he spends on same day or he may spend more than what he earn on same day. You are given an array of integers which represent his net savings (earning-expense), find minimum amount of money he should begin with to ensure that he always have some money (>0) at the end of any day. (https://www.geeksforgeeks.org/minimum-initial-energy-required-to-cross-street/)

13. Implement Deque class and its methods in Java (approach taken using doubly ended queue).
14. Trapping Rain Water: https://www.geeksforgeeks.org/trapping-rain-water/

15. Pangram question:
You have given a string =”This is ram”, you need to find all those letters that are missing in the string out of all 26 a-z letters present in alphabets

16. Given a sum, find the length of smallest subarray that has sum atleast to a given sum.

17. Number of ways to make coin change (https://www.geeksforgeeks.org/coin-change-dp-7/)

18. Longest palindromic substring (https://www.geeksforgeeks.org/longest-palindrome-substring-set-1/)

19. Value to be subtracted from array elements to make sum of all elements equals K

20. Given a string like ‘UUUDULR’, need to derive the final coordinates starting from (0, 0). This is pretty easy and he is asked to add a few other test cases if I would like to. Not much to add as it is not having any corner cases.

21.Given a dictionary, and a list of letters (or consider as a string), find the longest word that only uses letters from the string.

22. Question 1: String Implementation Question (Easy-Medium)

23. Question 2: Print recurrent digits in braces. Slight Modification to this Ques: https://www.geeksforgeeks.org/find-recurring-sequence-fraction/Example:

24. **Question 1:** Design a class in Java which implements the Deque interface. (i.e. Implement your own Double Ended Queue in Java without using any collections)7 methods to be implemented: addFirst(), addLast(), removeFirst(), removeLast(), peekFirst(), peekLast(), size()

25. Question 2: In 2D matrix, the gold coin is given in each cell. From the bottom left corner, you have to reach the top right corner by collecting the maximum points. (Similar to this: Maximum sum path in a matrix from top to bottom)

26. Find the first non-repeating character in the integer array. This question is similar to the given in geeksforgeeks : First non-repeating character
Initially i solved this question using 2 arrays which has the complexity for O(n^2)

but he then told me to simplify then i was able to do so in O(2n). After solving this question i was given another question

27. Given a dictionary of the words(strings) which contains different words & you are given an input string e.g. “abd”. You need to find the largest word available in the supplied dictionary which can be made using the letters of input string. The returned word can contain only the same no of occurrences of the letters as given in the input string i.e. if a letter is given once then in the output it should be existed only once. Examples:

1. Dictionary {“to”, “banana”, “toe”, “dogs”, “ababcd”, “elephant”} and input string is “eot”. Output should be “toe”
2. Dictionary is same as specified in example a but the input string is “ogtdes” and the output is “dogs” and “toes”

28. a/b + c/d = simple form

https://www.geeksforgeeks.org/goldman-sachs-interview-experience-1yr-experienced-2019/

29. grid [][] contain coins find optimal path to collect most coins (only allowed north and east)

30. Given a string ” A B A B C A B A B C D”, you have to compress it into the following format:

A B * C * D.
Here, till A B * of the output, A B repeats twice, but till A B * C *, A B A B C repeats twice.
I could not solve this and went to next question.

31. Given a matrix of numbers, the task was to collect the maximum numbers possible when going from bottom left corner of the matrix to top right corner of the matrix. The only two directions you can move are up and right. I was able to solve this.

32. Given two fractions which are represented as an array of two elements (numerator and denominator), the task to find the reduced fraction which is the sum of two fractions.

33. Given two sorted arrays, find the median of them.

34. Given a dictionary of words and a specific word, you need to find the list of the longest words in the dictionary which are anagrams of the given word.

35. Given an array in which there are arrays that are of length two, the first index of that array has the student name and the second index has the marks scored. Find the maximum average scored by any student. The array can have multiple subjects of marks for a particular student.

36. Suppose we are given a string “aaabbbbbccccdaa”, then we to print “a3b5c4d1a2”.

38. https://www.geeksforgeeks.org/minimum-length-subarray-sum-greater-given-value/): I took around 50 mins for fixing edge case in O(n) solution. So interviewer didn't give second question as rest of the time went into test cases writing.

Coderpad Round2 (1 hour, 2 questions):

38. https://www.geeksforgeeks.org/given-a-string-find-its-first-non-repeating-character/) (Allowed complexity: Time: O(n), Space: O(n))

39. Trapping rain water problem.

40. Find minimum sub array whose sum is at least to the given target.

41. www.geeksforgeeks.org/given-a-string-find-its-first-non-repeating-character/

42. https://www.spoj.com/problems/BYTESM2/ – (Variant of this problem with blocked grid and path was from bottom left to top right).

43. https://leetcode.com/problems/trapping-rain-water/ (Trapping the rainwater).

44. A variant of Knapsack (0-1)- https://www.geeksforgeeks.org/0-1-knapsack-problem-dp-10/ (She wanted the DP solution only. She was not accepting the recursive solution)

45. There are some students, sitting in a circle. Each student is assigned a roll no (1 to n). There is a teacher who was given an initial roll no and he has to remove the student with initial roll no. and then has to remove the student who was at that position starting

from the removed student. Your function should return the last student left.
Example: 2, 3, 1, 4, 5 start with 3, remove 3, then remove 5, then remove 1 (follow circle), then remove 4. Ans – 2. Problem is similar to
https://www.geeksforgeeks.org/josephus-problem-set-1-a-on-solution/

46. Given a list of students with their scores in different subjects find the student with a max average score.

48.
https://www.geeksforgeeks.org/find-minimum-element-in-a-sorted-and-rotated-array/
49.
https://www.geeksforgeeks.org/median-two-sorted-arrays-different-sizes-ologminn-m/
O(n) accepted

50. Find the first maximum length even word from a string.

51. Write a function that takes input and output as shown under:-

Input (string) Output (string)

—— ——

aaa a3

aabbcc a2b2c2

aaabcdd a3b1c1d2

a a1

52. a) You are an avid rock collector who lives in southern California. Some rare and desirable rocks just became available in New York, so you are planning a cross-country road trip. There are several other rare rocks that you could pick up along the way. You have been given a grid filled with numbers, representing the number of rare rocks available in various cities across the country. Your objective is to find the optimal path from So_Cal to New_York that would allow you to accumulate the most rocks along the way.

Note: You can only travel either north (up) or east (right).

b) Consider adding some additional tests in doTestsPass().

c) Implement optimalPath() correctly.

d) Here is an example:

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{{0, 0, 0, 0, 5}, New_York (finish) N

{0, 1, 1, 1, 0},

So_Cal (start) {2, 0, 0, 0, 0}} S

v

The total for this example would be 10 (2+0+1+1+1+0+5).

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**** Coderpad Round 2 ****

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1)

Given a string. Write a function to find the first non-repeating character in it. If there is no non-repeating character, return 0;

e.g.

Input (string) Output (char)

—— ——

aabbccd d

abbccddee a

iijjkkllmm 0

2)

Implement a function that takes two unsigned integers as arguments namely numerator & denominator and outputs a string representing the fraction in decimal form. If there is a repeating and non-terminating digit that appears in the decimal form, write that in parenthesis.

e.g.

Input (UINT n, UINT d) Output (string)

—– ——

2, 5 0.4

1, 2 0.5

1, 3 0.(3)

12, 5 2.4

11, 20 0.55

5, 3 1.(6)

53. Given a log file as some array of strings in a specified format where each lines begin with IP address. You have to find most frequently occurring IP.

54. You have to create your own parseInt() function in Java.

55. Find the nth line of pascal’s triangle, which we need to solve in 20 minutes.

56. Followed by 40 minutes technical interview.

57. An array of sentences containing an IP Address as a word in between. Print the most frequently occurring IP addresses(Duplicates also).

58. Median of two sorted arrays of different Lengths.

59. You have been given two arrays, find the dot product for it.

60. You have been given two fractions, you need to add those and reduce it to simplest form before returning answer from the method. Here suppose if denominator has not been passed then I had to throw error and catch it in main block. This was one of the test cases I wrote. I was asked to print 'Passed' if all test cases passed.

61. 1. Given a string, return the Run Length Encoded string for input string.

Ex- aaabbcdddddde -> a3b2c1d5e1https://www.geeksforgeeks.org/run-length-encoding/

62. Given a matrix of positive integers/points. We have to start from lower left corner and reach the upper right corner. Our path should be such that we fetch maximum points. Only two movements are allowed- up and right, i.e. from a cell (R, C), you can either go to (R, C+1) or (R-1, C).

63. Find the first non-repeating character in a string.https://www.geeksforgeeks.org/given-a-string-find-its-first-non-repeating-character/

64. Count no. of ways to reach nth stair from the bottom. Can take 1, 2 or 3 steps at a time.

https://www.geeksforgeeks.org/count-ways-reach-nth-stair/

65. Coderpad round; 2 problems; **Time**: **1 hour** (Java):
1. Minimum Distance between words:
Given a document/text and two words (which occur in the document), find the minimum distance between the occurrences of these 2 words. Distance between 2 words in a text is defined as the number of characters separating/between these 2 words.
The greedy solution to this problem was already implemented but it contained several (logical or semantic) bugs. Because of these bugs a set of test cases was producing wrong output.

The first objective for me was to identify and correct all the bugs such that all the given test cases pass.
Second objective was to create more test cases to find out other bugs (if any) present in the code, and further to fix these bugs.
2. Only around 20 minutes were left for the second problem in my case so it was relatively simpler.
Given a 2D array of size N×2, wherein thw first column in each row contains the name of student and the second column contains the marks of this student in certain subject, we need to find out the name of the student with maximum average marks and the maximum average marks. There can be multiple rows for a student storing marks obtained in different subjects.

66. https://www.geeksforgeeks.org/trapping-rain-water/

67.
https://www.geeksforgeeks.org/given-a-sequence-of-words-print-all-anagrams-together/

68. 1.The rainwater tapping problem.
https://www.geeksforgeeks.org/trapping-rain-water/

2.Anagram Problem.

https://www.geeksforgeeks.org/given-a-sequence-of-words-print-all-anagrams-together/

1) Find smallest element in sorted rotated array

2) Child can take 1, 2, 3 steps. Total steps he has to take is n. Find no. Of ways he can traverse those steps.

1) There are two fractions example: F1 = 3/4 and F2 = 5/6. You need to compute their sum and return the result.

2) One problem similar to described here:
https://www.geeksforgeeks.org/solve-dynamic-programming-problem/

1.) A car has to be given on rent. Different people come and ask for it for interval [s,e] and offer some price p. To whom shall the car be given in order to earn maximum.

2.) I don't remember the question exactly, but logic of the problem was BFS.

1. A robot can only move in four directions , UP(U), DOWN(D),LEFT(L),RIGHT(R). Given a string consisting of instructions to move , output the co-ordinates of robot after the executing the instructions. Initial position of robot is at origin(0,0).

2. Given an array of integers and a sum, output the number of pairs whose addition is equal to the given sum.

1. Given a string, the task is to find maximum consecutive repeating character in string

https://www.geeksforgeeks.org/maximum-consecutive-repeating-character-string/

2. Given a string, print the reverse order of the string.

https://www.geeksforgeeks.org/write-a-program-to-reverse-an-array-or-string/

Q. Given an array of non-negative numbers & a target value, return the length of smallest subarray whose sum is greater than the target value.