Hello All, You can solve any 5 problems from below and send solutions(python file with problem no) to me on sagy9975340919@gmail.com

1

Given a list of integers S and a target number k, write a function that returns a subset of S that adds up to k. If such a subset cannot be made, then return null.

Integers can appear more than once in the list. You may assume all numbers in the list are positive.

For example, given S = [12, 1, 61, 5, 9, 2] and k = 24, return [12, 9, 2, 1] since it sums up to 24.

2

Given a string, find the palindrome that can be made by inserting the fewest number of characters as possible anywhere in the word. If there is more than one palindrome of minimum length that can be made, return the lexicographically earliest one (the first one alphabetically).

For example, given the string "race", you should return "ecarace", since we can add three letters to it (which is the smallest amount to make a palindrome). There are seven other palindromes that can be made from "race" by adding three letters, but "ecarace" comes first alphabetically.

As another example, given the string "google", you should return "elgoogle".

3

Compute the running median of a sequence of numbers. That is, given a stream of numbers, print out the median of the list so far on each new element.

Recall that the median of an even-numbered list is the average of the two middle numbers.

For example, given the sequence [2, 1, 5, 7, 2, 0, 5], your algorithm should print out:

2
1.5
2
3.5
2
2
2

4

Run-length encoding is a fast and simple method of encoding strings. The basic idea is to represent repeated successive characters as a single count and character. For example, the string "AAAABBBCCDAA" would be encoded as "4A3B2C1D2A".

Implement run-length encoding and decoding. You can assume the string to be encoded have no digits and consists solely of alphabetic characters. You can assume the string to be decoded is valid.

5

Implement regular expression matching with the following special characters:

. (period) which matches any single character
* (asterisk) which matches zero or more of the preceding element
That is, implement a function that takes in a string and a valid regular expression and returns whether or not the string matches the regular expression.

For example, given the regular expression "ra." and the string "ray", your function should return true. The same regular expression on the string "raymond" should return false.

Given the regular expression ".*at" and the string "chat", your function should return true. The same regular expression on the string "chats" should return false.

6

The area of a circle is defined as πr^2. Estimate π to 3 decimal places using a Monte Carlo method.

Hint: The basic equation of a circle is x2 + y2 = r2.

7

Given an integer k and a string s, find the length of the longest substring that contains at most k distinct characters.

For example, given s = "abcba" and k = 2, the longest substring with k distinct characters is "bcb".

8

Given a list of integers, write a function that returns the largest sum of non-adjacent numbers. Numbers can be 0 or negative.

For example, [2, 4, 6, 2, 5] should return 13, since we pick 2, 6, and 5. [5, 1, 1, 5] should return 10, since we pick 5 and 5.

Follow-up: Can you do this in O(N) time and constant space?

9

Given an array of integers, return a new array such that each element at index i of the new array is the product of all the numbers in the original array except the one at i.

For example, if our input was [1, 2, 3, 4, 5], the expected output would be [120, 60, 40, 30, 24]. If our input was [3, 2, 1], the expected output would be [2, 3, 6].

Follow-up: what if you can't use division?

10

Given a list of numbers and a number k, return whether any two numbers from the list add up to k.

For example, given [10, 15, 3, 7] and k of 17, return true since 10 + 7 is 17.

Bonus: Can you do this in one pass?