

Competitive Programming Week-1 Exam

1. **My anagram:** Given two strings s and t, write a program to determine if t is an anagram of s

Example: s = "anagram", t = "nagaram" - true

s = "rat", t = "car" - false

Test case1: anagram, nagaram – true

Test case2: Keep, Peek – true

Test case3: Mother In Law, Hitler Woman – true

Test case4: School Master, The Classroom – true

Test case5: ASTRONOMERS, NO MORE STARS – true

Test case6: Toss, Shot – false

Test case7: joy, enjoy – false

Test case8: Debit Card, Bad Credit – true

Test case9: SiLeNt CAT, LisTen AcT – true

Test case10: Dormitory, Dirty Room – true

2. **Keys and rooms:** There are N rooms and you start in room zero. Each room has a distinct number in 0 to n-1. Each room may have some keys to access the next room.

Formally each room i has a list of keys rooms[i] and each key rooms[i][j] is an integer in 0 to n-1 where n=rooms.length. A key rooms[i][j]=v opens the room with number v.

Initially, all the rooms start locked except for room zero. You can walk back and forth between room freely. Return true if and only if you can enter every room

Example: [[1], [0,2], [3]] – true

[[1,3], [3,0,1], [2], [0]] – false

Test case1: [[1], [0,2], [3]] – true

Test case2: [[1,3], [3,0,1], [2], [0]] – false

Test case3: [[1,2,3], [0], [0], [0]] – true

Test case4: $[[1], [0,2,4], [1,3,4], [2], [1,2]]$ – true

Test case5: $[[1], [2,3], [1,2], [4], [1], [5]]$ – false

Test case6: $[[1], [2], [3], [4], [2]]$ – true

Test case7: $[[1], [1,3], [2], [2,4,6], [], [1,2,3], [1]]$ – false

3. Couples holding hands: N couples sit in $2N$ seats arranged in a row and want to hold hands. We want to know the minimum number of swaps so that every couple is sitting side by side. A swap consists of choosing any two people, then they stand up and switch seats.

The people and seats are represented by an integer from zero to $2n-1$. The couples are numbered in order, the first couple being (0,1), the second couple being (2,3) and so on with the last couple being ($2n-2$, $2n-1$).

The couples initial seating is given by $row[i]$ being the value of the person who is initially sitting in the i th seat.

Example: $[0,2,1,3]$ – 1

$[3,2,0,1]$ – 0

Test case1: $[1,3,4,0,2,5]$ - 2

Test case2: $[3,2,0,1]$ - 0

Test case3: $[3,30,50,90,16,91,65,18,61,58]$ - 5

Test case4: $[3,1,5,4,6,2]$ - 2

Test case5:

$[55,37,19,46,66,32,07,81,33,76,00,28,92,26,99,06,56,29,17,52,90,79,91,83,12,40,82,84,02,21,11,68,98,34,73,10,57,58,64,36]$ – 20

Test case6: $[1,0]$ – 0

Test case7: $[50,23,76,19,16,70,35,68,41,49,99,71,59,95,89,33,22,07,54,83,24,0,18,64,11,14,77,26,42,21,82,1,97,52,65,79,37,62,60,91,98,4,88,36,51,20,85,90,29,84,93,13,80,6,55,48,2,40,46,81,30,3,94,38,27,31,53,86,32,96,8,58,73,5]$ – 37