Indian Statistical Institute
M.Tech.(CS) — First Year
Programming Test 2023
Date: 04.08.2023 Time: 16:30–18:30

INSTRUCTIONS

1. **Please make sure that your programs adhere strictly to the specified input and output format.**
2. **In order to pass, you will have to write correct programs for at least 2 out of the following 3 problems.**

1. Given a sequence a_0, a_1, a_2, …, a_{n-1} of n *distinct* integers, and a target integer *target*, write a C program to print all those pairs a_i, a_j $(i < j)$ in the given sequence, such that $a_i + a_j = target$. Your program should print "No such pair" if there is no such pair that sums up to *target*. The input will consist of the value of n, *target* and the set of n numbers, as given below. For example, for Sample Input 1, the value of n is 7, value of *target* is 13, and the 7 numbers a_0, a_1, a_2, …, a_6 follow after that.

   Sample Input 1:
   7 13 1 2 3 4 5 10 11
   Sample Output 1:
   2 11
   3 10

   Sample input 2:
   9 11 -7 0 1 5 6 11 18 25 40
   Sample output 2:
   -7 18
   0 11
   5 6

   Sample input 3:
   9 9 -7 0 1 5 6 11 18 25 40
   Sample output 2:
   No such pair

2. Write a C program that takes a 9x9 matrix as input and checks if it is a valid sudoku solution.

   Sample Input 1:
   1 2 3 4 5 6 7 8 9
   4 5 6 7 8 9 1 2 3
   7 8 9 1 2 3 4 5 6
   2 3 4 5 6 7 8 9 1
   5 6 7 8 9 1 2 3 4
   8 9 1 2 3 4 5 6 7
   3 4 5 6 7 8 9 1 2

6 7 8 9 1 2 3 4 5
9 1 2 3 4 5 6 7 8

Sample Output 1:
Valid.

Sample Input 2:
2 1 3 4 5 6 7 8 9
3 6 6 7 8 9 1 2 3
7 8 9 1 2 3 4 5 6
2 3 4 5 6 7 8 9 1
5 6 7 8 9 1 2 3 4
8 9 1 2 3 4 5 6 7
3 4 5 6 7 8 9 1 2
6 7 8 9 1 2 3 4 5
9 1 2 3 4 5 6 7 8

Sample Output 2:
Invalid.

3. Write a C program that takes as input a text file containing a single line of text and reverses the order of words in it. Assume that the line contains no more than 128 characters, and is terminated by a newline character. The delimiter between two words is the space character.

Sample Input 1:
We, the people of India.
Sample Output 1:
India. of people the We,

Sample input 2:
Always do right. This will gratify some people and astonish the rest.
Sample output 2:
rest. the astonish and people some gratify will This right. do Always