

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 $a_0, a_1, a_2, \dots, a_{n-1}$ 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 $a_0, a_1, a_2, \dots, a_6$ 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