

**You have to answer here. No extra page will be provided.**

**Set B**

**Any examinee found adopting unfair means will be expelled from the trimester/program as per UIU disciplinary rules.**

## Instructions:

- Write the code by yourself. **Do not adopt any unfair means (No help from the internet, any human, or any existing code written by you or any one else is allowed).**
- Submit the code/codes in ELMS.
- Given hints are not the full solution of the problems.
- There are **two** questions. Answer all of them.

## Question 1

**[10]**

Write a **dynamic programming solution** for the following scenario:

You are running a server with **X** GB RAM. You allow people to use this server for money. Suppose, **N** customers want to run their program on your server tomorrow. The **i**-th customer wants to pay **M<sub>i</sub>** taka and his/her program will take **Y<sub>i</sub>** GB RAM. It is possible that you cannot accommodate all customers' requests due to limited RAM. **Which customers' requests should you keep so that your profit is maximized? What is the maximum profit?**

Assume, **M<sub>i</sub>** and **Y<sub>i</sub>** are integers.

Sample Input	Sample Output
N M <sub>1</sub> Y <sub>1</sub> ... M <sub>N</sub> Y <sub>N</sub> X	
5 33 23 67 12 21 14 19 25 51 19 50	Maximum profit 139 taka Keep the following requests customer 2 customer 3 customer 5
4 3 2 7 2 2 4 9 5 10	Maximum profit 19 taka Keep the following requests customer 1 customer 2 customer 4

## Question 2

[5]

Write a **greedy solution** for the following scenario:

You have two aunts Maria and Daisy, and **N** cousins. On Eid, your aunt Maria gave you **X1** taka and aunt Daisy gave you **X2** taka. Aunt Maria gave you **N** envelopes to distribute among your cousins, the **i**-th one containing **M\_i** taka. Aunt Daisy also gave you **N** envelopes to distribute among your cousins, the **i**-th one containing **D\_i** taka. **Find out if it is possible to distribute them in such a way that no cousin in total gets more money than you.**

**Hint:** Sort the envelopes given by aunt Maria, Sort the envelopes given by aunt Daisy.

Sample Input	Sample Output
<b>N X_1 X_2</b> <b>M_1 M_2 ... M_N</b> <b>D_1 D_2 ... D_N</b>	
5 6 6 2 3 4 1 5 2 1 9 8 5	yes
4 6 6 5 5 5 5 1 1 2 1	no