

Homework week 9

Algorithms – Part 1

1. Given a list of real numbers, your task is to implement a ‘quick’ sorting algorithm to order these numbers increasingly.

Input: The input consists of n in the first line and n real numbers separated by spaces in the next n lines.

Output: The sorted numbers and two numbers are separated by a space character.

Input	Output
6 3 5 2 2 1 8	1 2 2 3 5 8

2. Given an integer number X and a list A of n natural numbers that are the ages of n students, your task is to find a group students such that the sum of their ages is equal to X .

Input: The input consists of n and X in the first line, and n natural numbers in the second line separated by spaces.

Output: Write ‘YES’ if existed, otherwise ‘NO’

Input	Output
6 10 2 5 6 2 1 7	YES

3. Given n objects each has a weight w and a value v , your task is to select a number of objects with the largest sum of values conditioned that the sum of their weights is not greater than X .

Input: The input consists of numbers n and X in the first line, and n pairs of natural numbers (weight and value) in the next n lines.

Output: The largest sum of values identified.

Input	Output
5 10 1 1 2 2 3 3 9 9 8 10	12