**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 |

1. 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 |

1. 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.

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