

There are 1 questions for a total of 10 points.

- (10) 1. *The 2-partition problem*: Given a sequence of $2n$ integers, your task is to check if it is possible to partition these integers into n subsets, each containing two integers, such that the sum of numbers in every subset is exactly the same. For example, consider the sequence 6, 1, 4, 4, 3, 5, 2, 7, 6, 2. The following 2-partition exists for this sequence: (1, 7), (2, 6), (2, 6), (3, 5), (4, 4). You may assume that $1 \leq n \leq 10000$.

Your programs should take input from a file named `input.txt` and should write the output in a file named `output.txt`. Your programs should produce an output within 1 minutes for this assignment. The format for input and output files is as follows.

INPUT: The first line of the input file gives n . This is followed by a comma-separated sequence of $2n$ integers given on the second line. Below is an example of an input file.

```
5
14, 2, 13, 3, 12, 1, 1, 15, 4, 11
```

OUTPUT: The output should be **yes** if there exists such a 2-partition. Otherwise, the output should be **no**. For example, consider the output file corresponding to the input file above:

```
no
```

Note: There are **no** whitespaces or newline characters at the end of the output file. Having such whitespaces might lead to the autograder marking the output as incorrect.

SUBMISSION INSTRUCTIONS: All your program files should be in a directory `module_2.prog`. You will be asked to create a zip of this directory and submit this zip file. Your Python program should be in a file named `checkpartition.py`. This, when executed, should read the input file (`input.txt`) and write the answer in the output file (`output.txt`).