CMPUT 275 - Tangible Computing **Winter 2018**
Morning Problem: Candy

Description

Sara and Alex are given n different pieces of candy of varying sizes. They want to know if they can split up the candy (without breaking any piece) so that they each receive the same total size of candies.

For example if the candy sizes are:

```
1 2 5 4
```

we could give Sara candies with sizes $4, 2$ and Alex the candies with sizes $5, 1$. They both get the same total size of 6.

Note: Each individual doesn't have to be assigned the same number of pieces, see the examples below.

Input

The first line of input is n with $1 \leq n \leq 20$ the number of pieces of candy.

The second line contains n space separated integers x_i with $0 \leq x_i \leq 10,000$. These describe the various sizes of the pieces of candy. Note some candy may have size 0.

Output

Output `True` if we could split the candy into two groups so Sara and Alex get the same amount of candy. Otherwise, output `False`.

Sample Input 1

```
4
1 2 5 4
```

Sample Output 1

```
True
```

Sample Input 2

```
5
4 5 6 7 8
```

Sample Output 2

```
True
```

Explanation: One way to split the candy is $4, 5, 6$ and $7, 8$, both with total size 15.

Sample Input 3

```
4
5 1 5 11
```

Sample Output 3

```
True
```

Explanation: One way to split the candy is $5, 1, 5$ and 11, both with total size 11.

Sample Input 4

```
4
6 2 4 2
```

Sample Output 4

```
False
```

Explanation: It is impossible to divide these candies into two groups with exactly the same size.