

## Uncle Grandpa and jobs distribution

Uncle Grandpa has  $n$  jobs, each will take  $a_i$  minutes to be completed. He is having helped by 3 workers, and Uncle Grandpa has to distribute these jobs to the 3 workers so that the amount of time to complete all jobs is minimum. All workers will start doing their jobs at the same time, after our Grandpa finished allocating jobs for them. The time that it takes to finish all jobs will be the maximum amount of time of the 3 workers needed to finish their allocated jobs.

### Input

The first line contains a single integer  $n$ ,  $1 \leq n \leq 16$

The second line contains  $n$  integers  $a_i$  ( $1 \leq a_i \leq 10^9$ ) – the time that it takes to finish the  $i^{th}$  jobs.

### Output

The minimum amount of time to finish all jobs

### Examples

Input (jobs1.in)	Output (jobs1.out)
5 1 2 4 1 3	4

Input (jobs2.in)	Output (jobs2.out)
4 5 3 1 4	5

Input (jobs3.in)	Output (jobs3.out)
5 13 13 10 13 15	26

### Explanation:

In the 1<sup>st</sup> example, one of the possible way as follows:

- Worker 1: 1<sup>st</sup> and 2<sup>nd</sup> jobs (with sum of  $1 + 2 = 3$ )
- Worker 2: 3<sup>rd</sup> job (with sum of 4)
- Worker 3: 4<sup>th</sup> and 5<sup>th</sup> jobs (with sum of  $1 + 3 = 4$ )

In the 2<sup>nd</sup> example, one of the possible way as follows:

- Worker 1: 1<sup>st</sup> job (with sum of 5)
- Worker 2: 2<sup>nd</sup> and 3<sup>rd</sup> jobs (with sum of  $3 + 1 = 4$ )
- Worker 3: 4<sup>th</sup> job (with sum of 4)

## Note:

1. A skeleton file has been given to help you. You should not create a new file or rename the file provided. You should develop your program using this skeleton file.
2. You are free to define your own helper methods and classes (or remove existing ones) if it is suitable but you must put all the new classes, if any, in the same skeleton file provided

## Skeleton File

You are given the skeleton file `Jobs.java`. You should see the following contents when you open the file:

```
/**
 * Name      :
 * Matric. No :
 */

import java.util.*;

public class Jobs {
    private void run() {

    }

    public static void main(String args[]) {
        Jobs runner = new Jobs();
        runner.run();
    }
}
```