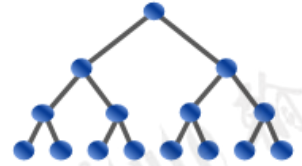


# USA Computing Olympiad



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## USACO 2024 DECEMBER CONTEST, SILVER PROBLEM 1. CAKE GAME

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English (en) ▾

Bessie and Elsie have discovered a row of  $N$  cakes ( $2 \leq N \leq 5 \cdot 10^5$ ,  $N$  even) cakes, with sizes  $a_1, a_2, \dots, a_N$  in that order ( $1 \leq a_i \leq 10^9$ ).

Each cow wants to eat as much as possible. However, being very civilized cows, they decided to play a game to split it! The game proceeds with both cows alternating turns. Each turn consists of one of the following:

1. Bessie chooses two adjacent cakes and stacks them, creating a new cake with the sum of the sizes.
2. Elsie chooses either the leftmost or rightmost cake and puts it in her stash.

When only one cake remains, Bessie eats it, and Elsie eats all cakes in her stash. If both cows play optimally to maximize the amount of cake they eat and Bessie plays first, how much cake will each cow eat?

### INPUT FORMAT (input arrives from the terminal / stdin):

Each input consists of  $T$  ( $1 \leq T \leq 10$ ) independent test cases. It is guaranteed that the sum of all  $N$  within an input does not exceed  $10^6$ .

Each test case is formatted as follows. The first line contains  $N$ . The next line contains  $N$  space-separated integers,  $a_1, a_2, \dots, a_N$ .

### OUTPUT FORMAT (print output to the terminal / stdout):

For each test case, output a line containing  $b$  and  $e$ , representing the amounts of cake Bessie and Elsie respectively will consume if both cows play optimally.

### SAMPLE INPUT:

```
2
4
40 30 20 10
4
10 20 30 40
```

### SAMPLE OUTPUT:

```
60 40
60 40
```

For the first test case, under optimal play,

1. Bessie will stack the middle two cakes. The cakes now have sizes  $[40, 50, 10]$ .
2. Elsie will eat the leftmost cake. The remaining cakes now have sizes  $[50, 10]$ .
3. Bessie stacks the remaining two cakes.

Bessie will eat  $30 + 20 + 10 = 60$  cake, while Elsie will eat 40 cake.

The second test case is the reverse of the first, so the answer is the same.

### SCORING:

- Input 2: All  $a_i$  are equal.
- Input 3:  $N \leq 10$
- Inputs 4-7:  $N \leq 5000$
- Inputs 8-11: No additional constraints.

Problem credits: Linda Zhao, Agastya Goel, Gavin Ye

Contest has ended. No further submissions allowed.

