Median

Description

There is a sequence $(a_0, a_1, \cdots, a_{n-1})$.
For any $0 \leq i \leq n-1$, let $(b_0, b_1, \cdots, b_{i-1})$ be a sorted version of $(a_0, a_1, \cdots, a_{i-1})$ in increasing order. Median m_i is defined as $b_{\lfloor \frac{i}{2} \rfloor}$.

For example, $n = 5$,

a_0	a_1	a_2	a_3	a_4
6	3	-5	1	2

$i = 0$
median $m_0 = b_{\lfloor \frac{0}{2} \rfloor} = b_0 = 6$

b_0
6

$i = 1$
median $m_1 = b_{\lfloor \frac{1}{2} \rfloor} = b_0 = 3$

b_0	b_1
3	6

$i = 2$
median $m_2 = b_{\lfloor \frac{2}{2} \rfloor} = b_1 = 3$

b_0	b_1	b_2
-5	3	6

$i = 3$
median $m_3 = b_{\lfloor \frac{3}{2} \rfloor} = b_1 = 1$

b_0	b_1	b_2	b_3
-5	1	3	6

$i = 4$
median $m_4 = b_{\lfloor \frac{4}{2} \rfloor} = b_2 = 2$

b_0	b_1	b_2	b_3	b_4
-5	1	2	3	6

Input

Your program is to read from standard input. Input consists of two lines. In first line you are given an integer n, $(1 \leq n \leq 100{,}000)$. In next line you are given n integers $a_0, a_1, \cdots, a_{n-1}$, $(-10^8 \leq a_i \leq 10^8)$ separated by a space.

Output

Your program is to write to standard output. Print $m_0, m_1, \cdots, m_{n-1}$ in a single line, separated by a space.

Sample

Input1	Output1
5 6 3 -5 1 2	6 3 3 1 2

Input2	Output2
5 -85930638 -52917848 59574598 -14631796	-85930638 -85930638 -52917848 -52917848