

Merge Sort

Develop the Merge Sort algorithm on an integer list.

Input

- The first line is an integer N ($1 \leq N \leq 10^6$), the number of integers.
- The i^{th} line of the next N lines contains the integer ($0 \leq n_i \leq 10^9$).

Output

Output N rows, each row contains the integer in an ascending order.

Sample

| Input | Output |
|-------|--------|
| 5 | 0 |
| 5 | 1 |
| 4 | 3 |
| 1 | 4 |
| 0 | 5 |
| 3 | |