G. Partitions

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given a set of n elements indexed from 1 to n. The weight of i-th element is w_i. The weight of some subset of a given set is denoted as . The weight of some partition R of a given set into k subsets is (recall that a partition of a given set is a set of its subsets such that every element of the given set belongs to exactly one subset in partition).

Calculate the sum of weights of all partitions of a given set into exactly k **non-empty** subsets, and print it modulo $10^9 + 7$. Two partitions are considered different iff there exist two elements x and y such that they belong to the same set in one of the partitions, and to different sets in another partition.

Input

The first line contains two integers n and k $(1 \le k \le n \le 2 \cdot 10^5)$ — the number of elements and the number of subsets in each partition, respectively.

The second line contains n integers w_i $(1 \le w_i \le 10^9)$— weights of elements of the set.

Output

Print one integer — the sum of weights of all partitions of a given set into k **non-empty** subsets, taken modulo $10^9 + 7$.

Examples

input

```
4 2
2 3 2 3
```

output

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160
```

input

```
5 2
1 2 3 4 5
```

output

```
645
```

Note

Possible partitions in the first sample:

1. $\{\{1, 2, 3\}, \{4\}\}$, $W(R) = 3 \cdot (w_1 + w_2 + w_3) + 1 \cdot w_4 = 24$;
2. $\{\{1, 2, 4\}, \{3\}\}$, $W(R) = 26$;
3. $\{\{1, 3, 4\}, \{2\}\}$, $W(R) = 24$;
4. $\{\{1, 2\}, \{3, 4\}\}$, $W(R) = 2 \cdot (w_1 + w_2) + 2 \cdot (w_3 + w_4) = 20$;
5. $\{\{1, 3\}, \{2, 4\}\}$, $W(R) = 20$;
6. $\{\{1, 4\}, \{2, 3\}\}$, $W(R) = 20$;
7. $\{\{1\}, \{2, 3, 4\}\}$, $W(R) = 26$;

Possible partitions in the second sample:

1. $\{\{1, 2, 3, 4\}, \{5\}\}$, $W(R) = 45$;
2. $\{\{1, 2, 3, 5\}, \{4\}\}$, $W(R) = 48$;
3. $\{\{1, 2, 4, 5\}, \{3\}\}$, $W(R) = 51$;

4. $\{\{1, 3, 4, 5\}, \{2\}\}$, $W(R) = 54$;
5. $\{\{2, 3, 4, 5\}, \{1\}\}$, $W(R) = 57$;
6. $\{\{1, 2, 3\}, \{4, 5\}\}$, $W(R) = 36$;
7. $\{\{1, 2, 4\}, \{3, 5\}\}$, $W(R) = 37$;
8. $\{\{1, 2, 5\}, \{3, 4\}\}$, $W(R) = 38$;
9. $\{\{1, 3, 4\}, \{2, 5\}\}$, $W(R) = 38$;
10. $\{\{1, 3, 5\}, \{2, 4\}\}$, $W(R) = 39$;
11. $\{\{1, 4, 5\}, \{2, 3\}\}$, $W(R) = 40$;
12. $\{\{2, 3, 4\}, \{1, 5\}\}$, $W(R) = 39$;
13. $\{\{2, 3, 5\}, \{1, 4\}\}$, $W(R) = 40$;
14. $\{\{2, 4, 5\}, \{1, 3\}\}$, $W(R) = 41$;
15. $\{\{3, 4, 5\}, \{1, 2\}\}$, $W(R) = 42$.