Problem 4: Snap Dragons: Accumulate

Input File: *accin.txt*
Output File: *accout.txt*

Time limit	Memory limit
1 second	256 MB

Statement

Have you ever heard of Melodramia, my friend? It is a land of magic forests and mysterious swamps, of sprinting heroines and dashing heroes. And it is home to two dragons, Rose and Scarlet, who, despite their competitive streak, are the best of friends.

Rose had recently been to China and learnt a very fun solitaire game there for Scarlet to try.[1] In this game, there are N cards piled from top to bottom. Each card has a integer score written on it, which may be positive or negative, or zero.

The game consists of Scarlet having to perform the following move sequence at most K times:

1. Choose 2 or more of the cards from the top. Let the sum of their scores be S.

2. Scarlet adds S points to her total score.

3. Scarlet removes the chosen cards and adds a new card with value S to the top of the pile.

4. If there is only 1 card left on the pile the game ends.

   Scarlet wishes to maximise her total score at the end of game. Scarlet knows the card pile's values and the value of K in advance and wants you to help her maximise her score. Calculate this score.

Input

The first line of input contains 2 integers N K. The next line contains N integers $a_1 \ldots a_N$, the values of the cards in the pile from top to bottom.

Output

Output 1 integer, the maximum final score.

---

[1]Indeed, this game is very similar to a problem from this year's Chinese provincial informatics selection exam, which we have adapted for educational purposes only.

Sample Input 1

```
3 1
2 -1 2
```

Sample Output 1

```
3
```

Sample Input 2

```
7 3
-4 3 0 7 -3 -5 -3
```

Sample Output 2

```
9
```

Sample Input 3

```
8 3
1 -1 1 -1 1 -1 1 -1
```

Sample Output 3

```
3
```

Sample Input 4

```
3 2
-1 -2 -3
```

Sample Output 4

```
0
```

Explanation

- In sample input 1, Scarlet performs just one move. She selects all 3 cards, and the score is $2 + (-1) + 2 = 3$.

- In sample input 2, Scarlet first removes the top 4 cards. A card with value $(-4) + 3 + 0 + 7 = 6$ is then added to the top. Then she removes the top two cards of the deck which scores her another $6 + (-3) = 3$ points. Hence her final score is $6 + 3 = 9$.

- In sample input 3, Scarlet removes the top 3 cards for all 3 moves, gaining one point per move.

- In sample input 4, Scarlet does not make any moves, and hence her final score is 0. Note Scarlet does not need to use all of her K moves.

Constraints

- $1 \leq K < N \leq 10^5$

- $-10^5 \leq a_i \leq 10^5$ for all i

Subtasks

- For Subtask 1 (20 points), $K = 1$.

- For Subtask 2 (20 points), $a_i \geq a_{i-1}$ for all $i \geq 2$.

- For Subtask 3 (20 points), $N \leq 1000$.

- For Subtask 4 (20 points), $K = N - 1$.

- For Subtask 5 (20 points), No further constraints.