Optimal separation P50778_en

Consider the sequence $1, 2, \ldots, n$. If we use k separators among those numbers, we get $k + 1$ subsequences. Let s_i be the sum of the elements of the i-th subsequence. Let m be the minimum s_i, and let M be the maximum s_i. Given n and k, please choose where to place the k separators so that $M - m$ is as small as possible.

Input

Input consists of several cases, each one with n and k. You can assume $1 \leq n \leq 50$ and $0 \leq k \leq \min(n - 1, 10)$.

Output

For every case, print $k + 3$ lines. On the first line print the minimum $M - m$. Afterwards, print a line for each of the $k + 1$ subsequences, in order, with the numbers and their sum. Finally, print a line with 10 dashes. Follow exactly the format of the sample output. If there is more than one optimal solution, choose any one.

Observation

The expected solution is a dynamic programming. This problem could also be solved by precomputing the solutions. But, if you do that, your solution will be manually rejected.

Sample input 1

```
4 0
50 10
```

Sample output 1

```
0
1 + 2 + 3 + 4 = 10
----------
40
1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14 + 15 = 120
16 + 17 + 18 + 19 + 20 + 21 + 22 = 133
23 + 24 + 25 + 26 + 27 = 125
28 + 29 + 30 + 31 = 118
32 + 33 + 34 = 99
35 + 36 + 37 = 108
38 + 39 + 40 = 117
41 + 42 + 43 = 126
44 + 45 + 46 = 135
47 + 48 = 95
49 + 50 = 99
----------
```

Problem information

Author: Josep Grané

Generation: 2026-01-25T11:04:17.473Z