Problem B: Bipartite Blanket

Time limit: 3 s
Memory limit: 512 MiB

In a *bipartite graph*, nodes are partitioned into two disjoint sets A and B such that every edge connects a node from A with a node from B. A *matching* M is a set of edges where no two edges share a common node. We say that a matching M *blankets* a set of nodes V if every node in V is an endpoint of at least one edge in M.

We are given a bipartite graph where each node is assigned a *weight* — a positive integer. Weight of a set of nodes is simply the sum of the weights of the individual nodes.

Given an integer threshold t, find the number of different sets of nodes V such that the weight of V is at least t and V is blanketed by at least one matching M.

Input

The first line contains two integers n and m ($1 \leq n, m \leq 20$) — the number of nodes in A and B respectively. Let us denote the nodes of A with $a_1, a_2, \ldots, a_n$ and the nodes of B with $b_1, b_2, \ldots, b_m$.

The following n lines contain m characters each that describe the edges of the graph. The j-th character in the i-th line is "1" if there is an edge between a_i and b_j and "0" otherwise.

The following line contains n integers $v_1, v_2, \ldots, v_n$ ($1 \leq v_k \leq 10\,000\,000$) — the weights of the nodes $a_1, a_2, \ldots a_n$. The following line contains m integers $w_1, w_2, \ldots, w_m$ ($1 \leq w_k \leq 10\,000\,000$) — the weights of the nodes $b_1, b_2, \ldots b_m$.

The following line contains an integer t ($1 \leq t \leq 400\,000\,000$) — the weight threshold.

Output

Output the number of sets of nodes whose weight is at least t and are blanketed by at least one matching M.

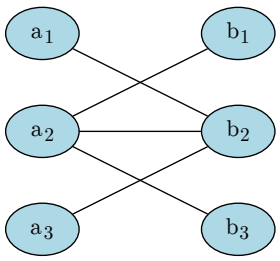
Example

input

```
3 3
010
111
010
1 2 3
8 5 13
21
```

output

```
3
```



input

```
3 2
01
11
10
1 2 3
4 5
8
```

output

```
13
```

In the first example above, subset $\{a_1, a_2, b_2, b_3\}$ is blanketed by matching $\{(a_1, b_2), (a_2, b_3)\}$ and has weight 21. Subsets $\{a_3, b_2, b_3\}$ and $\{a_2, a_3, b_2, b_3\}$ are both blanketed by matching $\{(a_2, b_3), (a_3, b_2)\}$, and have weights 21 and 23 respectively. All the other subsets either weigh less than 21 or are not blanketed by any matching. For example, subset $\{a_2, a_3, b_1, b_3\}$ has weight 26, but is not blanketed by any matching, so it's not included in the count.