

Grammy and Jewelry

Input file: **standard input**
Output file: **standard output**
Time limit: 0.5 seconds
Memory limit: 512 megabytes

There is a connected undirected graph with n vertices and m edges. Vertices are indexed from 1 to n . There is infinite jewelry in vertex i ($2 \leq i \leq n$), each valued a_i . Grammy starts at point 1. Going through each edge consumes 1 unit of time. She can pick up a piece of jewelry at vertex i and put it down at vertex 1. Picking up and putting down a piece of jewelry can be done instantly. Additionally, she can carry at most 1 piece of jewelry at any time. When she put down a piece of jewelry valued x at vertex 1, she obtains the value of it. Now, for each k between 1 and T (inclusive) she wonders what is the maximum value she can get in k units of time.

Input

The input contains only a single case.

The first line contains three integers n , m , and T ($1 \leq n, m, T \leq 3000$).

The second line contains $n - 1$ integers a_2, a_3, \dots, a_n ($1 \leq a_i \leq 3000$).

The following m lines describe m edges. Each line contains 2 integers x_i and y_i ($1 \leq x_i, y_i \leq n$), representing a bidirectional edge between vertex x_i and vertex y_i .

Note that the graph may contain self-loops or duplicated edges.

Output

Print T integers in one line, the k -th ($1 \leq k \leq T$) of which denoting the maximum value she can get in k units of time.

Example

standard input	standard output
5 6 5	0 3 3 6 6
2 3 4 5	
1 2	
4 5	
5 5	
2 3	
1 3	
3 3	