

## Matrix Multiplication

**Task:** Let  $n \in \mathbb{N}$ . You are given an  $n \times n$ -matrix  $A$ , and a vector  $v$  of size  $n$ . Most of the entries in  $A$  and  $v$  will be equal to zero. Compute the vector  $Av$ .

**Input:** The first line contains the dimension  $n$  of the matrix  $A$ . You can assume that  $1 \leq n \leq 100000$ . The second line contains the number  $m$  of non-zero entries in  $A$ . Then,  $m$  lines follow: Each of the following lines contain three integers  $i$ ,  $j$ , and  $a_{ij}$ , which means that at position  $(i, j)$ , the matrix has the value  $a_{ij}$ . You can assume that  $0 \leq i, j \leq n - 1$ , and that  $-5 \leq a_{ij} \leq 5$ . The values of the matrix are given in increasing lexicographical order.

After the  $m$  lines, a line follows which contains the number  $b$  of non-zero entries in  $v$  follows. Then, each of the following  $b$  lines contains a number  $i$  with  $0 \leq i \leq n - 1$ , and the value  $v_i$ .

**Output:** Output the values of  $Av$  that are unequal to zero. That is, if the  $i$ -th value of  $Av$  is unequal to zero, then print a line containing at first an  $i$  and then the corresponding value of  $Av$ .

**Sample Input:**

```
3
4
0 0 1
0 1 -5
0 2 -4
1 0 -3
2
0 3
2 3
```

**Sample Output:**

```
0 -9
1 -9
```