

B. Colorful Field

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Fox Ciel saw a large field while she was on a bus. The field was a $n \times m$ rectangle divided into 1×1 cells. Some cells were wasteland, and other each cell contained crop plants: either carrots or kiwis or grapes.

After seeing the field carefully, Ciel found that the crop plants of each cell were planted in following procedure:

- Assume that the rows are numbered 1 to n from top to bottom and the columns are numbered 1 to m from left to right, and a cell in row i and column j is represented as (i, j) .
- First, each field is either cultivated or waste. Crop plants will be planted in the cultivated cells in the order of $(1, 1) \rightarrow \dots \rightarrow (1, m) \rightarrow (2, 1) \rightarrow \dots \rightarrow (2, m) \rightarrow \dots \rightarrow (n, 1) \rightarrow \dots \rightarrow (n, m)$. Waste cells will be ignored.
- Crop plants (either carrots or kiwis or grapes) will be planted in each cell one after another cyclically. Carrots will be planted in the first cell, then kiwis in the second one, grapes in the third one, carrots in the forth one, kiwis in the fifth one, and so on.

The following figure will show you the example of this procedure. Here, a white square represents a cultivated cell, and a black square represents a waste cell.

Now she is wondering how to determine the crop plants in some certain cells.

Input

In the first line there are four positive integers n, m, k, t ($1 \leq n \leq 4 \cdot 10^4, 1 \leq m \leq 4 \cdot 10^4, 1 \leq k \leq 10^3, 1 \leq t \leq 10^3$), each of which represents the height of the field, the width of the field, the number of waste cells and the number of queries that ask the kind of crop plants in a certain cell.

Following each k lines contains two integers a, b ($1 \leq a \leq n, 1 \leq b \leq m$), which denotes a cell (a, b) is waste. It is guaranteed that the same cell will not appear twice in this section.

Following each t lines contains two integers i, j ($1 \leq i \leq n, 1 \leq j \leq m$), which is a query that asks you the kind of crop plants of a cell (i, j) .

Output

For each query, if the cell is waste, print `Waste`. Otherwise, print the name of crop plants in the cell: either `Carrots` or `Kiwis` or `Grapes`.

Examples

input
4 5 5 6 4 3 1 3 3 3 2 5 3 2 1 3 1 4 2 3 2 4 1 1 1 1
output
Waste Grapes Carrots

Kiwis
Carrots
Carrots

Note

The sample corresponds to the figure in the statement.