

UCF “Practice” Local Contest — August 27, 2011

Symmetric Diagonals (Filename: symm)

Consider the following matrix:

```
A B D F H
C A B D F
E C A B D
G E C A B
I G E C A
```

The elements labeled A are on the First *Symmetric Diagonal* of this matrix. The elements labeled B are on one of the Second Symmetric Diagonals, and the elements labeled C are on the other Second Symmetric Diagonal. Likewise, D's and E's are on the Third Symmetric Diagonals, and so on.

You are to write a program which, given a square matrix of characters, prints some requested symmetric diagonals.

The Input:

There will be several sets of input. Each input set will begin with an integer n ($1 \leq n \leq 15$), indicating the size of the matrix. On each of the next n input lines, there will be n capital letters (with exactly a single space between letters) representing a row of the matrix. On the next input line will be a positive integer k , indicating the number of symmetric diagonals being requested from this matrix. On each of the next k input lines, there will be an integer representing a request. The integers representing requests are valid, i.e., they are guaranteed to be between 1 and n inclusive. End of data is indicated by a value of zero for the matrix size (i.e., $n = 0$).

The Output:

Print a heading for each input matrix. Then, echo print the matrix on consecutive output lines with a single space between letters. Then, for each request, print the message:

Symmetric diagonals r:

where r is the number of the symmetric diagonals requested. Print the symmetric diagonals on subsequent output lines. Print the upper diagonal before the lower, print the values as they appear from left to right in the matrix, and print a single space between letters. Leave a blank line after the output for each data set. Follow the format illustrated in Sample Output.

(Sample Input/Output on the next page)

Sample Input:

2
T B
E O
1
1
4
F A S X
F R L O
L U E I
Q A N D
2
2
3
0

Sample Output:

Input matrix #1:
T B
E O
Symmetric diagonals 1:
T O

Input matrix #2:
F A S X
F R L O
L U E I
Q A N D
Symmetric diagonals 2:
A L I
F U N
Symmetric diagonals 3:
S O
L A