Pac Man

Pac Man can move horizontally or vertically on a game board consisting of a rectangular grid. Pac Man starts from the top-left corner and must reach the exit at the bottom right corner in the least amount of time possible (least number of steps). Along the way, Pac Man can collect goodies that are found at each intersection point in the grid. The goodies have a numeric value, and your objective is to find the maximal total value that Pac Man can obtain.

Input

The first input line contains the positive integer N, and the rest of the input consists of N descriptions of game boards. The first line of the description of a board contains two positive integers r and c, with $0 < r < 100$ and $0 < c < 100$, representing the number of rows and column in the board, respectively. Then r input lines follow, each describing a row with c numbers corresponding to the items at each of the c intersection on that row. The first item on the first row is always the character "P" representing Pac Man's initial location, and the last item on the last line is always the character "E" representing the exit. All other items are positive integers less than 1000 representing the value of the goodies at each intersection.

Output

For each board i, print `Game Board #`i`:` x, where x is the maximal score that Pac Man can obtain along a valid, minimal path from start to exit.

Examples

Sample input 1

```
2
3 4
P 3 2 8
1 4 9 3
6 2 2 E
2 2
P 5
401 E
```

Sample output 1

```
Game Board #1: 19
Game Board #2: 401
```

Limits

Time limit is 1 seconds.

Memory limit is 256 megabytes.