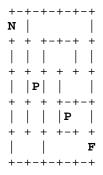**Monster Hunter Mini-World Assignment**

Introduction

You have been tasked with catching monsters! As a computer programmer you have come to the conclusion that you probably won't be able to out muscle some of the large beasts you are attempting to capture. Instead, you will use your brain and your unique skillset to strategically lay out traps that will guarantee a captured monster.
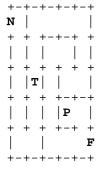
Details

You have carefully studied the monster and its habitat. This has allowed you to determine the best locations to lay traps. Traps can only be set in certain areas. You will develop a computer program to make this task easy and efficient.

The terrain in which the monster lives has been saved in a text file which looks as follows:

```
+-+-+-+-+-+
N |       |          * The maze is always a square
+ + +-+-+ +          * The N represents the monsters nest
| | |   | |          * The F represents the monsters food source
+ + + + + +          * The P represents a potential trap site
| |P| |   |          * The file does not have a fixed name
+ + + +-+-+
| | | |P  |
+ + + +-+ +
|   |    F
+-+-+-+-+-+
```

Your program will read the file and determine where to set a trap. In the above example the best (and only) option for a trap that would guarantee capture would be in the first **P**. The solution is seen below:

```
+-+-+-+-+-+
N |       |          * The T represents the trap that has been placed
+ + +-+-+ +          * Your program will generate this solution and
| | |   | |          * write it to a file (solution.txt)
+ + + + + +          * You DO NOT want to waste your inventory of traps
| |T| |   |
+ + + +-+-+
| | | |P  |
+ + + +-+ +
|   |    F
+-+-+-+-+-+
```

Level 3: Your program asks for and loads a file. It sets all the traps along the monsters path to its destination and no others. This guarantees the monsters capture. It then outputs the results to a file called 'solution.txt'

Level 4: It sets the minimum number of traps to guarantee the monsters capture.
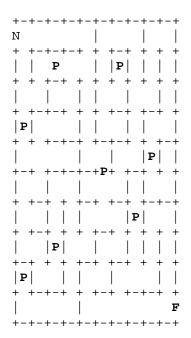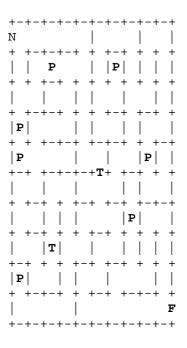
EXTENSIONS:

Level 4+: Determine how long it will take to capture the monster. That is, the worst case scenario if the monster heads from **N** to **F**. This is measured by the number of steps the monster takes until capture.

Level 4++: Determine how long it will take to lay down all the traps. That is, the numbers of steps you will have to take to travel to all the other traps once you have laid down your first trap.

<u>Additional Information</u>

* You will need to complete level 3 & 4 before you can move on to the extensions
* You will be given a series of test cases that increase in difficulty
* Mazes will never have a 'room'
* While taking a path towards its food, a monster will never backtrack
* The N and F will always be placed in the same location in every map
* Recursion is your friend!
* Keep checking the assignment details for updates

```
+-+-+-+-+-+-+-+-+-+-+           +-+-+-+-+-+-+-+-+-+-+
N         |     |   |           N         |     |   |
+ +-+-+-+ + +-+ + + +           + +-+-+-+ + +-+ + + +
| |   P   | |P| | | |           | |   P   | |P| | | |
+ + +-+ + + + + + + +           + + +-+ + + + + + + +
|   |   | |   | | |             |   |   | |   |   | |
+ +-+-+ + + +-+ +-+ +           + +-+-+ + + +-+ +-+ +
|P|     | |   | |   |           |P|     | |   | |   |
+ + +-+-+ +-+-+ + +-+           + + +-+-+ +-+-+ + +-+
|       |   |  |P| |            |P        |   |  |P| |
+-+ +-+-+-+P+ +-+ + +           +-+ +-+-+-+T+ +-+ + +
|   |   |     | | |             |   |   |     | | |
+ +-+ + +-+ +-+ +-+-+           + +-+ + +-+ +-+ +-+-+
|   | | |       |P|   |         |   | | |       |P|   |
+ +-+ + + +-+ + + + +           + +-+ + + +-+ + + + +
|   |P| |   | | | | |           |   |T| |   | | | | |
+-+ + + +-+ +-+ + + +           +-+ + + +-+ +-+ + + +
|P|   | |   |     | |           |P|   | |   |     | |
+ +-+-+ + +-+ +-+-+ +           + +-+-+ + +-+ +-+-+ +
|       |           F           |       |           F
+-+-+-+-+-+-+-+-+-+-+           +-+-+-+-+-+-+-+-+-+-+
```

__ steps to capture monster
__ steps to set traps