**20. Sweet 16**

# Program Name: Sixteen.java Input File: sixteen.dat

After your 16th birthday, you go for a ride with your brand-new license. However, after setting off, you realize you left your wallet and your license at home. Find the shortest path from your home to school, while avoiding all the police.

**Input**

The first line of input will contain a single integer n that indicates how many test cases to follow. The first line of each test case will contain two integers r and c, the dimensions of the map you will be travelling on. The next r lines will consist of c characters each and will be made up of the following:

# represents a wall.

. represents open space.

H represents your starting point.

S represents your ending point.

P represents a police car. You cannot go into any square adjacent to a police car, or you will fail. However, squares diagonally adjacent to a police car are fine.

**Output**

For each maze, output the maze, but with the shortest path replaced with \*. There may be multiple shortest paths; as long as the distance is correct, then the solution is correct. If the maze is impossible, output Not Possible. Print a newline between each test case.

**Example Input File**

2

5 5

H####

..P.#

....#

#...S

.....

2 2

H#

#S

**Example Output to Screen**

H####

\*.P.#

\*\*..#

#\*\*\*S

.....

Not Possible