


```
#####  
#x..xxx.#  
#####  
#####  
#####  
#####
```

One possible sequence of events could be as follows:

- FJ places the robot at the upper-left-most starting position.
- The robot moves one unit to the right.
- The robot replicates.
- All robots move one unit to the right.
- Another replication would cause a copy of the robot to move into a rock, so the process terminates.

```
#####      #####      #####      #####  
#.....#    #.....#    #.x.....#    #.x.....#  
#x.....#    #.x.....#    #xxx.....#    #.xxx.....#  
#.....#    #.....#    #.x.....#    #.x.....#  
##### -> ##### -> ##### -> #####  
#.....#    #.....#    #.....#    #.....#  
#####      #####      #####      #####  
#####      #####      #####      #####  
#####      #####      #####      #####  
#####      #####      #####      #####
```

SAMPLE INPUT:

```
10 2  
#####  
#.#.....#  
#.#.....#  
#S.....#  
#.#.....#  
#.#.....#  
#####  
#####  
#####  
#####
```

SAMPLE OUTPUT:

28
Locations that could be occupied by robots:

```
#####  
#x#.xxx.#  
#x#xxxxx.#  
#xxxxxxxxx#  
#x#xxxxx.#  
#x#.xxx.#  
#####  
#####  
#####  
#####
```

SAMPLE INPUT:

```
10 2  
#####  
#.S#.....#  
#.#.....#  
#S.....#  
#.#.....#  
#.#.....#  
#####  
#####  
#####  
#####
```

SAMPLE OUTPUT:

Locations that could be occupied by robots:

```
#####  
#xx#.....#  
#xx#.....#  
#xxx.....#  
#xx#.....#  
#x.#.....#  
#####  
#####  
#####  
#####
```

SCORING:

- Test cases 4-5 satisfy $D = 10^9$.
- Test cases 6-8 satisfy $D = 1$.
- Test cases 9-12 satisfy $N \leq 100$.
- Test cases 13-20 satisfy no additional constraints.

Problem credits: Benjamin Qi

Contest has ended. No further submissions allowed.