

Picobot

Square

If there's nothing to the S, go S

0 ***x -> S 0

If there are walls to East or/and South go W

0 x*xS -> W 0

If there are walls to West and South go E and switch to stage 1

0 xxWS -> E 1

If there are walls besides East, go E

1 *x** -> E 1

If there are walls to East or/and South, go N

1 xEx* -> N 2

If there is a wall to East, go West, and switch to stage 3

2 xExx -> W 3

If there are no walls, continue to go West

3 xxxx -> W 3

If there is a wall to West, go N and switch to stage 4

3 xxWx -> N 4

If there are walls to West or/and North, or/and East, or/and South, go East and repeat at stage 1

4 **W* -> E 1

Square explanation:

In big picture, I want my picobot to go down first and then work on the way up. For 0 ***x -> S 0, I want my picobot where ever it starts at, and if picobot is at the bottom of the room already, it will start with next rule which is 0 x*xS -> W 0. When my picobot reaches the bottom, it will move to the left because of rule 0 x*xS -> W 0, and I said x*xS because my picobot might start going to the left from the bottom right corner. I set the rule 0 x*xs -> W 0 because I want it to repeat till it reaches west side of the wall. In addition, I set up the rule 0 xxWS -> E 1 because my picobot might not have covered the entire bottom line, so it will move to the left once and then repeat by using 1 *x** -> E 1. After swiping the bottom line, my picobot will be at the bottom right corner. At this point, I want my picobot to move up once at surrounding xEx*, and I set up the rule xEx* because if I set it up at xExS, it will only apply to the bottom right corner. After moving up once from bottom right corner, the picobot will move to the left once (2 xExx -> W 3) and repeat going to the right (3 xxxx -> W 3). When my picobot reaches at the west wall, it will go up by one using 3 xxWx -> N 4. Lastly, I set my last rule as 4 **W* -> E 1 to the left once and then repeat the rules from stage 1 so it will eventually clean the whole room.

Diamond

If there's nothing to the North, go N
0 x*** -> N 0
If there are walls around North, East, and South, go W
0 NExS -> W 0
If there are walls around North, West, and South, go E
0 NxWS -> E 0
If there are walls at North, go S and switch to stage 1
0 N**x -> S 1
If there are no walls, continue to go S
1 xxxx -> S 1
If there are walls around East and West, go W and repeat at stage 0
1 xExS -> W 0
If there are walls around West, South, or/and East, go N and switch to stage 2
1 x*WS -> N 2
If there no walls, go W and switch to stage 3
2 xxxx -> W 3
If there is nothing to the North and East, go N
3 xx** -> N 3
If there are walls at North and West, go S and repeat to stage 1
3 NxWx -> S 1
If there are walls around North, West, and South, go E and switch to stage 4
3 NxWS -> E 4
If there are no walls, go E
4 xxxx -> E 4
If there are walls to North, East, and South, go W and repeat to stage 0
4 NExS -> W 0

Diamond explanation:

In big picture, I want my picobot to clean up and down and move to the left once and repeat, and if my picobot starts from the left side and finishes cleaning up, I want it to go to the right side and finish the rest. Before I begin, I added these rules (0 NExS -> W 0, 0 NxWS -> E 0) because my picobot might start from left or right corner. Let's say that my picobot starts from the right side, it will go all the way up by setting this rule 0 x*** -> N 0. Next, it will swipe rest of the column by going down once (0 N**x -> S 1), and repeat going down (1 xxxx -> S 1). When it reaches the bottom, my picobot will go to the left once and repeat by setting the rule to stage 0, so it will go up and down till it reaches the very bottom (1 xExS -> W 0). When it reaches at the very bottom, it will move up by one (1 x*WS -> N 2), and move one to the left (2 xxxx -> W 3). Then, my picobot will move up till the end (3 xx** -> N 3), and go down till the end and repeat going up once, left once, and then up and down by looping at stage 1 (3 NxWx -> S 1). And when it reaches at very left corner, it will go to the right once (3 NxWS -> E 4) and repeat going all the way to the very right side of the room (4 xxxx -> E 4). When it reaches at the very right side of the room, it will loop around the whole set of rules by looping back to stage 0 (4 NExS ->

W 0). Even if my picobot starts on the left side of the room, it will still work due to having rules set up at starting stage 1 (1 x*WS -> N 2, 2 xxxx -> W 3, 3 xx** -> N 3, 3 NxWx -> S 1).