

Problem of the Week

Problem B and Solution

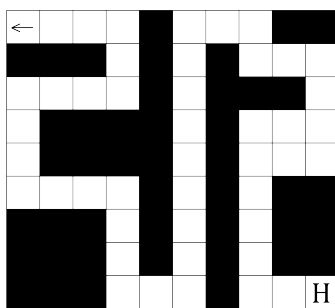
Help Send Freddy Home

Problem

Freddy the Robot starts in the top left square of the maze below, facing left (symbolized by $\leftarrow$). Freddy wants to get to his Home Charging Station in the bottom right corner of the maze, marked with an **H**. Freddy can only turn right (clockwise on the diagram), and will only turn the number of degrees which you tell him. As well, he will go exactly the number of squares you tell him and in the direction that the arrow is currently pointing.

For example, if he starts facing $\leftarrow$, and your command said, “Turn 180 degrees and go 3 spaces”, he would turn 180° right (clockwise) and then move 3 spaces forward (to the right).

Write a program of commands that gets Freddy to his Home Charging Station.



Solution

A program of commands is below. Note that there two options for commands 12 and 14. The second option is in parentheses.

1. Turn 180° and go 3 spaces.
2. Turn 90° and go 2 spaces.
3. Turn 90° and go 3 spaces.
4. Turn 270° and go 3 spaces.
5. Turn 270° and go 3 spaces.
6. Turn 90° and go 3 spaces.
7. Turn 270° and go 2 spaces.
8. Turn 270° and go 8 spaces.
9. Turn 90° and go 2 spaces.
10. Turn 90° and go 1 space.
11. Turn 270° and go 2 spaces.
12. Turn 90° and go 3 (or 2) spaces.
13. Turn 90° and go 2 spaces.
14. Turn 270° and go 4 (or 5) spaces.
15. Turn 270° and go 2 spaces.

Now Freddy is at his Home Charging Station!