

# 1 Computer Science, Algorithms, & Programs

Some definitions:

- computer science: the study of algorithms and their implementation
- algorithm: a step-by-step process for solving a category of problems.
- program: a sequence of instructions expressed in a language that can be executed directly, or indirectly, by a computer

Key takeaways:

- Python is a high level language. To run a python program on your computer, you need a another program! That program will *translate* your python code into a low-level language that the computer can understand.
- There is a difference between an algorithm and a program.
- When solving problems in this class, you must first design an algorithm. Once you have an algorithm, you can think about translating into a computer program.
- Novice programmers tend to spend too little time thinking carefully about their algorithm.

## 2 Picobot cheatsheet

Detailed instructions are provided with your homework... this is just a quick cheatsheet for class.

**Surroundings:** are always considered in NEWS order. An x represents empty space, the appropriate direction letter (N, E, W, and S) represents a wall blocking that direction. For example, NxWS means there is a wall in every direction but East.

**State:** picobot's state is simply a number between 0 and 99. Picobot always starts in state 0.

**Rules:** Picobot rules look like this:

StateNow	Surroundings	->	MoveDirection	NewState
0	xxxS	->	N	1

This rule means “if Picobot starts in state 0 and sees the surroundings xxxS, it should move North and change to state 1.”

**Wildcards:** the asterisk \* can be used inside surroundings to mean “I don't care whether there is a wall or not in that position.” For example,

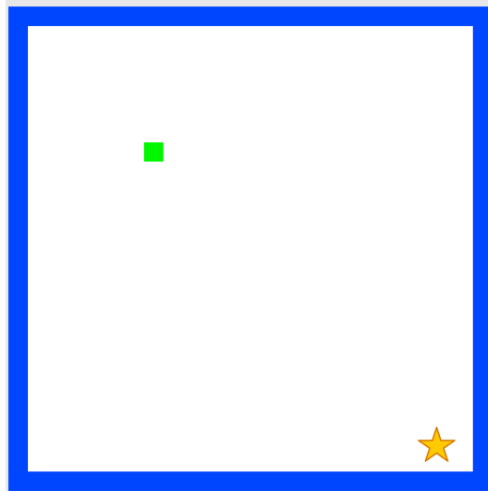
StateNow	Surroundings	->	MoveDirection	NewState
0	xE**	->	N	3

means “if there is no wall North and there is a wall to the East and I don't care about West or South, then move North and change to state 3.”

## Exercises

Some picobot problems have been presented in class. Try this problem on your own.

1. Create a program that will get picobot to the SOUTHEAST corner of the empty room. Your rules should work regardless of Picobot's starting position!



Write your program here:

```
StateNow      Surroundings  ->  MoveDirection      NewState
```