Program Design

Invasion Percolation: The Grid

5	3	7	2	6	1	1	3	4
8	5	6	5	7	2	3	6	2
2	5	8	7	5	5	6	5	9
5	2	6	4	9	3	9	6	5
4	6	8	8	5	9	7	3	9
7	6	4	5	1	2	6	8	5
5	4	2	5	8	5	5	5	8
5	7	5	1	5	3	8	5	5
4	5	1	9	7	8	6	5	1

Need:

- a random 2D grid

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2	5	8	7	5	5	6	5	9
5	2	6	4	9	3	9	6	5
4	6	8	8	5	9	7	3	9
7	6	4	5	1	2	6	8	5
5	4	2	5	8	5	5	5	8
5	7	5	1	5	3	8	5	5
4	5	1	9	7	8	6	5	1

Need:

- a random 2D grid
- to mark cells

5	3	7	2	6	1	1	3	4
8	5	6	5	7	2	3	6	2
2	5	8	7	5	5	6	5	9
5	2	6	4	9	3	9	6	5
4	6	8	8		9	7	3	9
7	6	4	5			6	8	5
5	4	2	5	8		5	5	8
5	7	5	1	5	3	8	5	5
4	5	1	9	7	8	6	5	1

Don’t care about a cell’s value after it has been filled

5	3	7	2	6	1	1	3	4
8	5	6	5	7	2	3	6	2
2	5	8	7	5	5	6	5	9
5	2	6	4	9	3	9	6	5
4	6	8	8	−1	9	7	3	9
7	6	4	5	−1	−1	6	8	5
5	4	2	5	8	−1	5	5	8
5	7	5	1	5	3	8	5	5
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So use any value that can't ever be a real cell value to mark filled cells

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This kind of error can be very hard to track down

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Are grids always square?

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Are grids always square?

Are they always odd × odd (so that there is a unique center square)?

5	3	7	2	6	1	1	3
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How general should we make the first version of our program?

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How general should we make the first version of our program?

"Don't build it until you need it."

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How general should we make the first version of our program?

"Don't build it until you need it."

vs.

"A week of hard work can sometimes save you an hour of thought."

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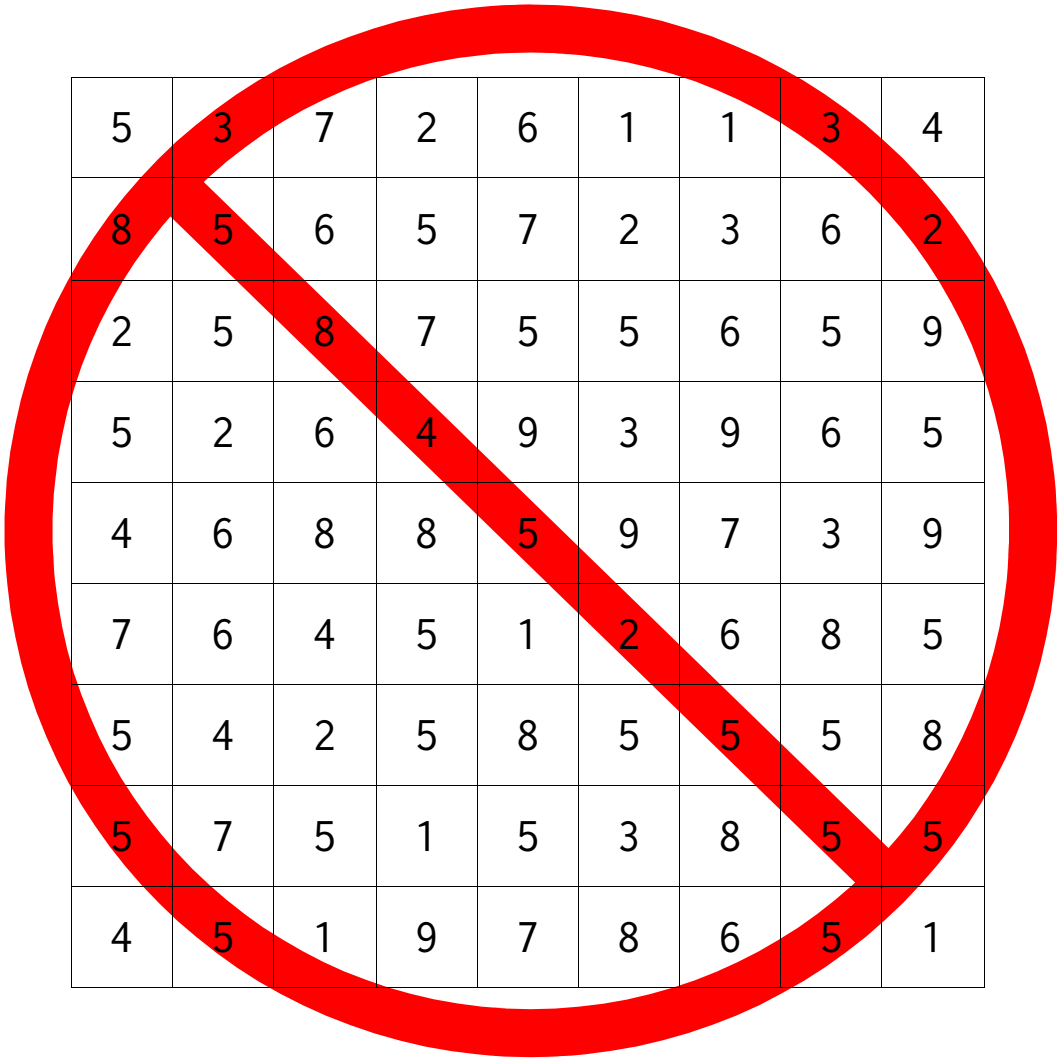
Knowing what rules to apply when comes with experience

The only way to get experience is to work through many examples



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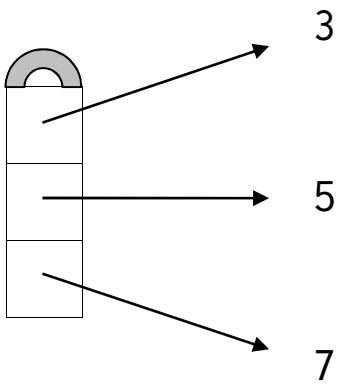
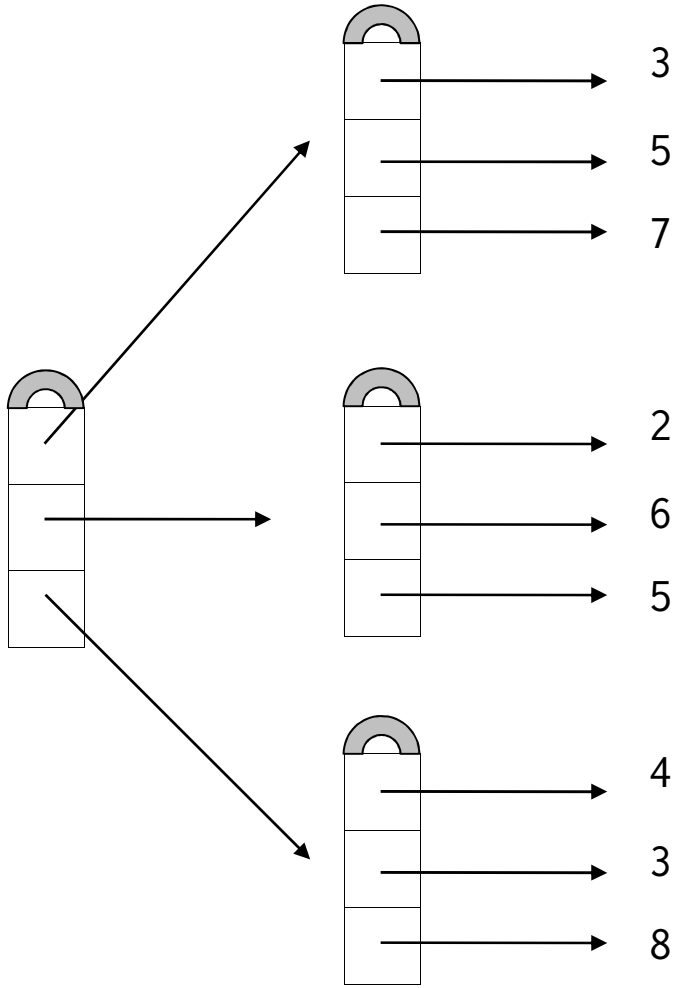
Problem: Python doesn't actually have 2D arrays



But it does have

1D lists



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Which can refer to

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```
grid[1][0] == 2
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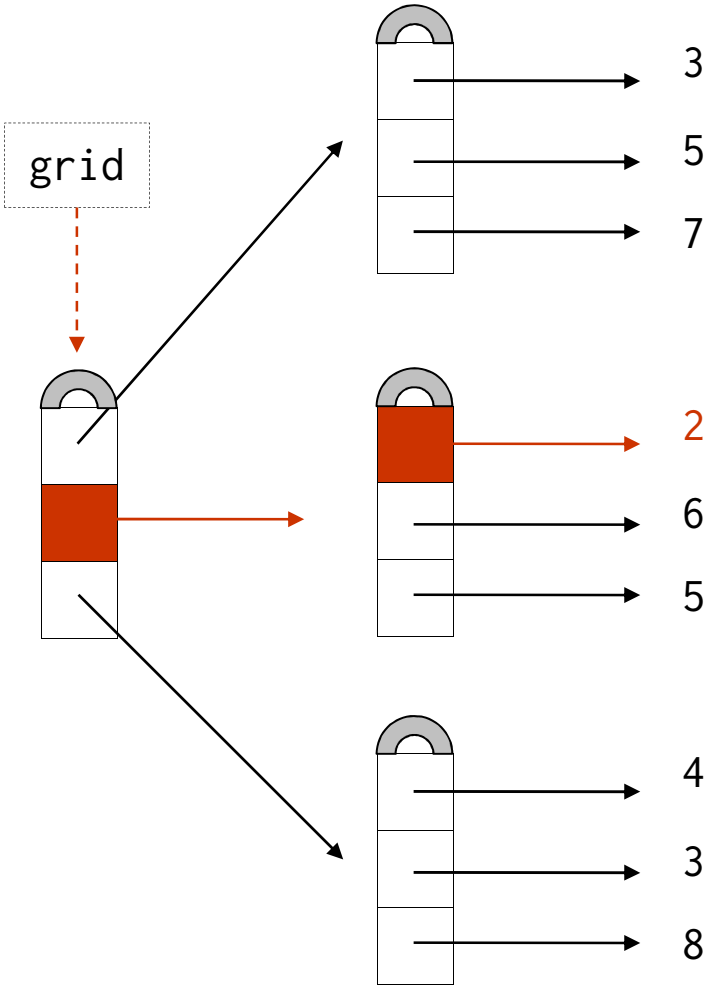

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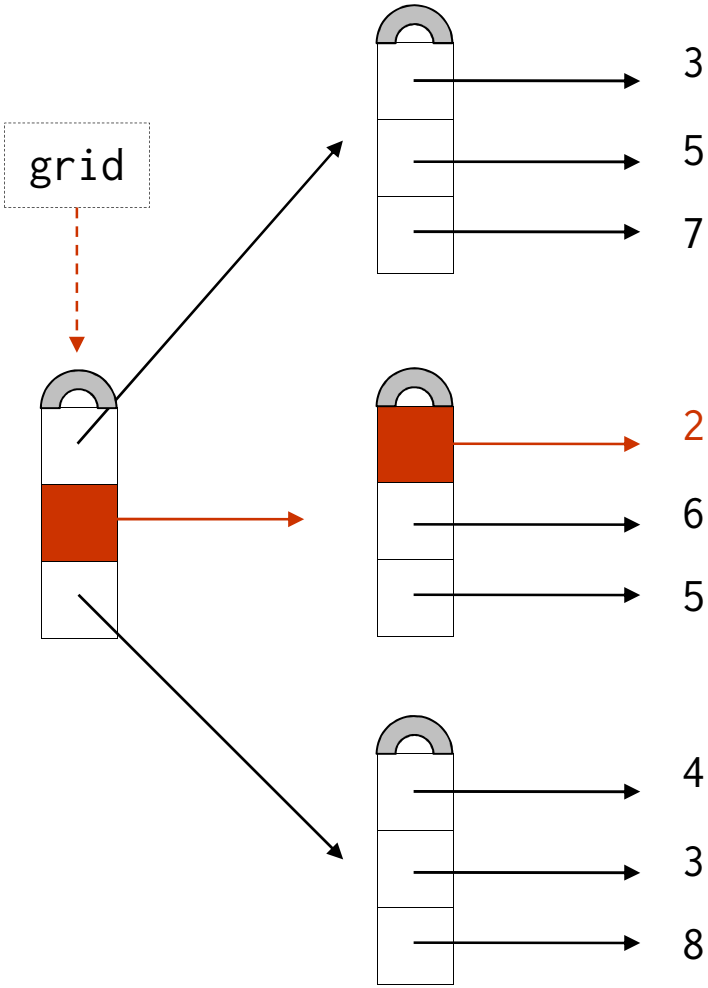

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...which is really what

we mean by

“two-dimensional”

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# Create an NxN grid of random integers in 1..Z.
assert N > 0, "Grid size must be positive"
assert N%2 == 1, "Grid size must be odd"
grid = []
for x in range(N):
  grid.append([])
  for y in range(N):
    grid[-1].append(1) # FIXME: need a random value
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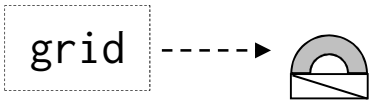

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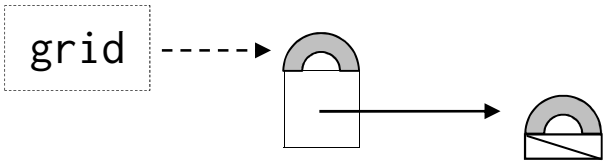

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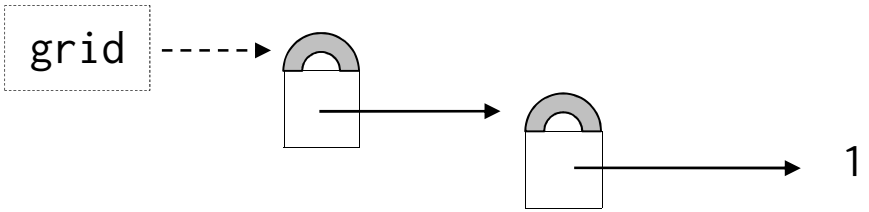

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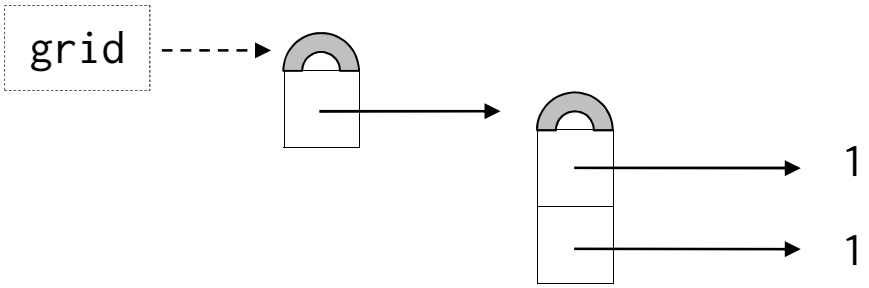

software carpentry

created by

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