

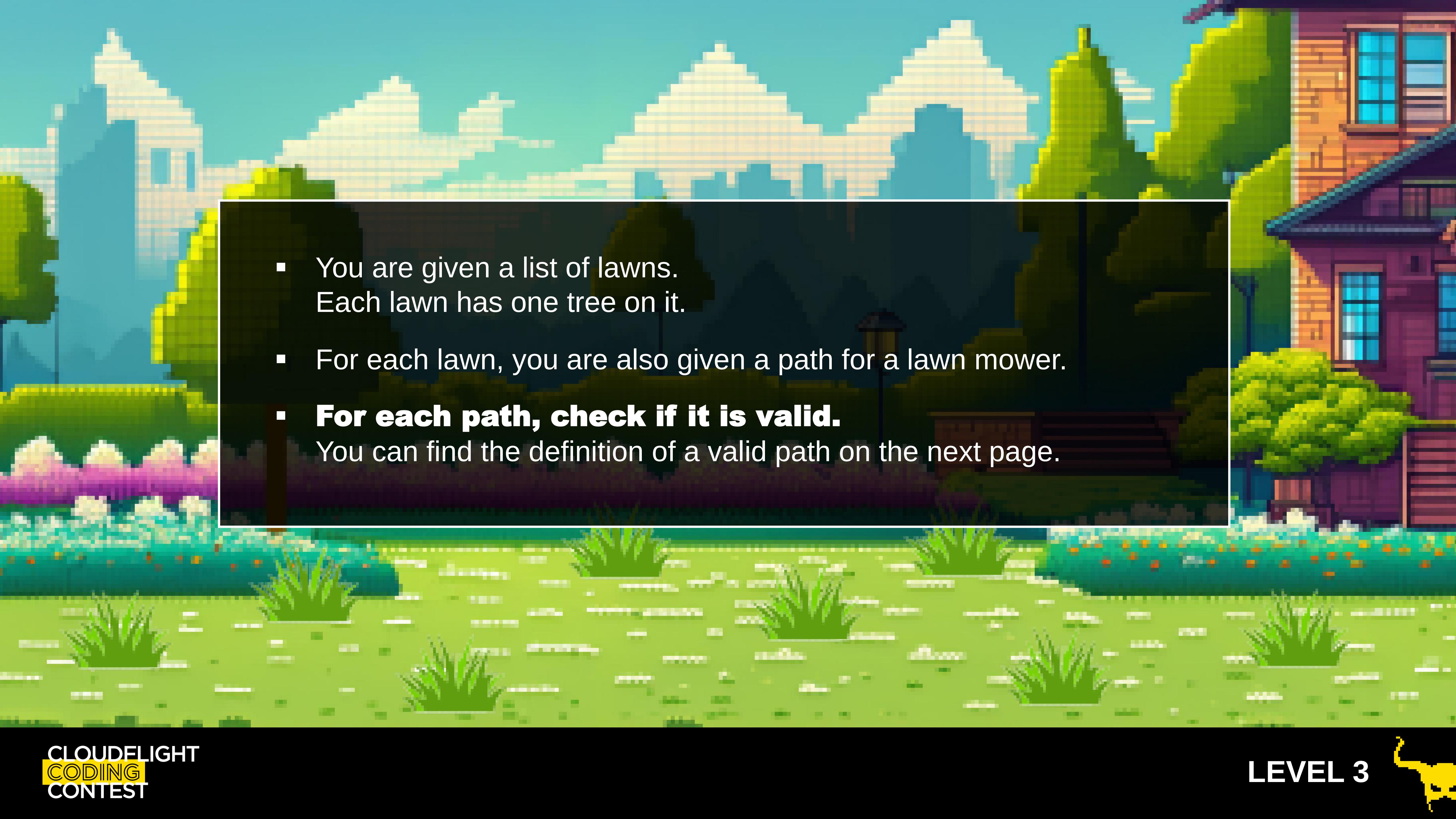


LEVEL 3

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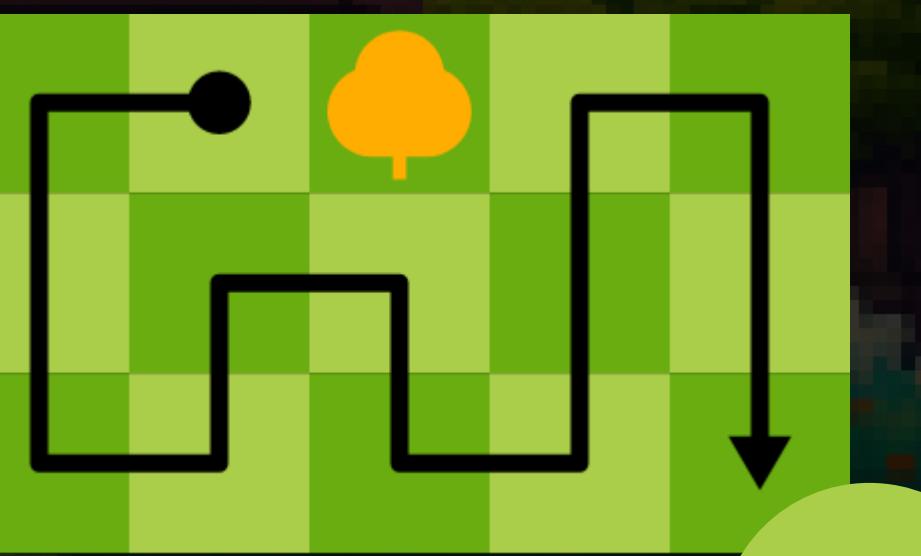
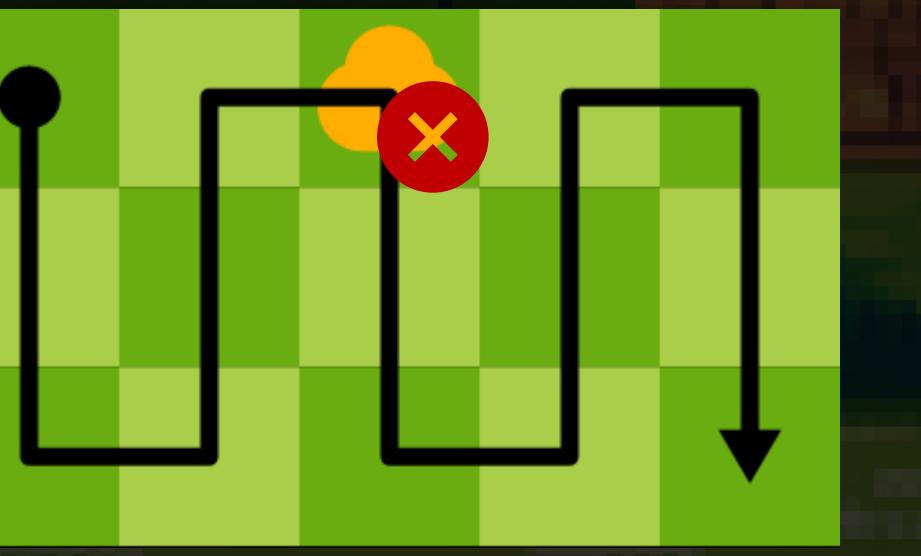
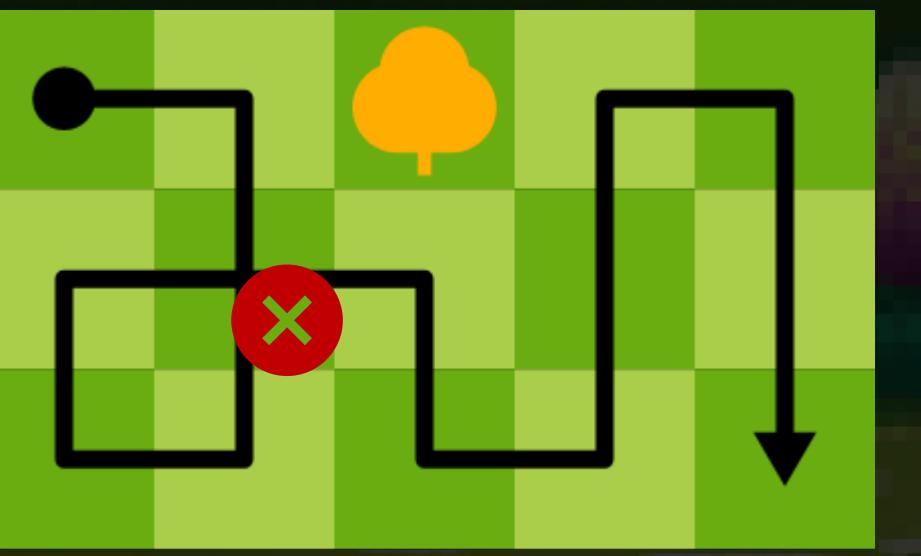
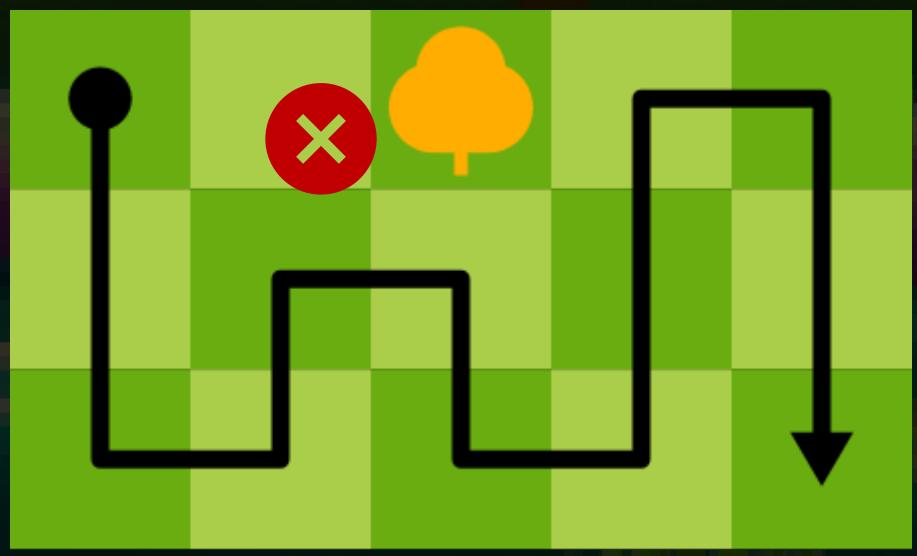
LEVEL 3

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- You are given a list of lawns. Each lawn has one tree on it.
 - For each lawn, you are also given a path for a lawn mower.
 - **For each path, check if it is valid.** You can find the definition of a valid path on the next page.



A path is valid if:

- It visits each free cell of the given lawn
- It **does not** visit any cell twice
- It **does not** visit the cell with the tree on it
- It **does not** leave the lawn



Input

Name	Description	Example
N	Number of lawns	4 5 3 .X.. SSDWSDWWDSS
Repeated N times		5 3 .X..
Lawn size	The width followed by the height of the lawn, separated by a space	DSSAWDDSDWWDSS
Lawn	A paragraph of characters '.' represents a free cell 'X' represents the tree	5 3 .X.. SSDWWDSSDWWDSS
Path	A string of characters	5 3 .X.. ASSDWSDWWDSS

Output

Name	Description	Example
Validity (repeated N times)	'VALID' if the conditions of the previous page are met Otherwise 'INVALID'	INVALID INVALID INVALID VALID



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Lawn Mower