Fundamentals of Artificial Intelligence

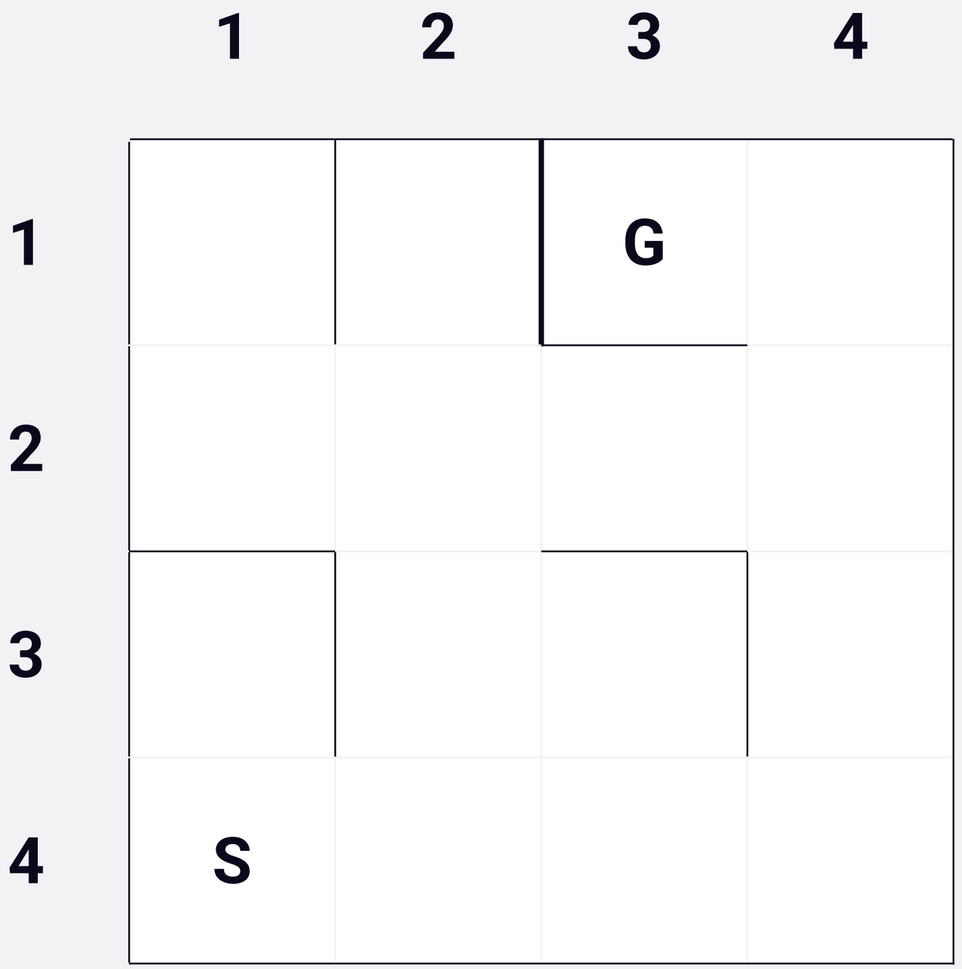
Laboratory

Dr. Mauro Dragoni

Department of Information Engineering and Computer Science
Academic Year 2022/2023

Exercise 5.3

- LRTA*



- The agent starts from S, it has to reach G. Each step costs 1. Heuristic is based on Manhattan distance.

- In case of same h(s) values, the order of possible actions are: UP, RIGHT, DOWN, LEFT

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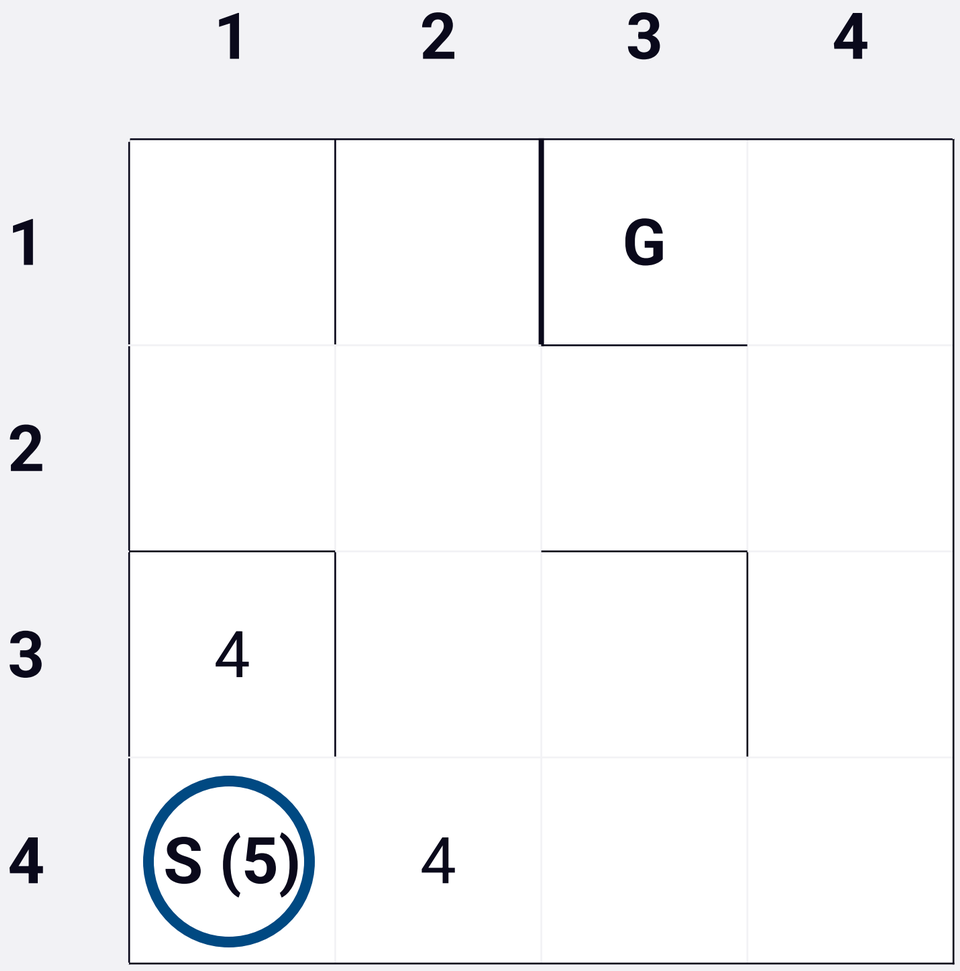

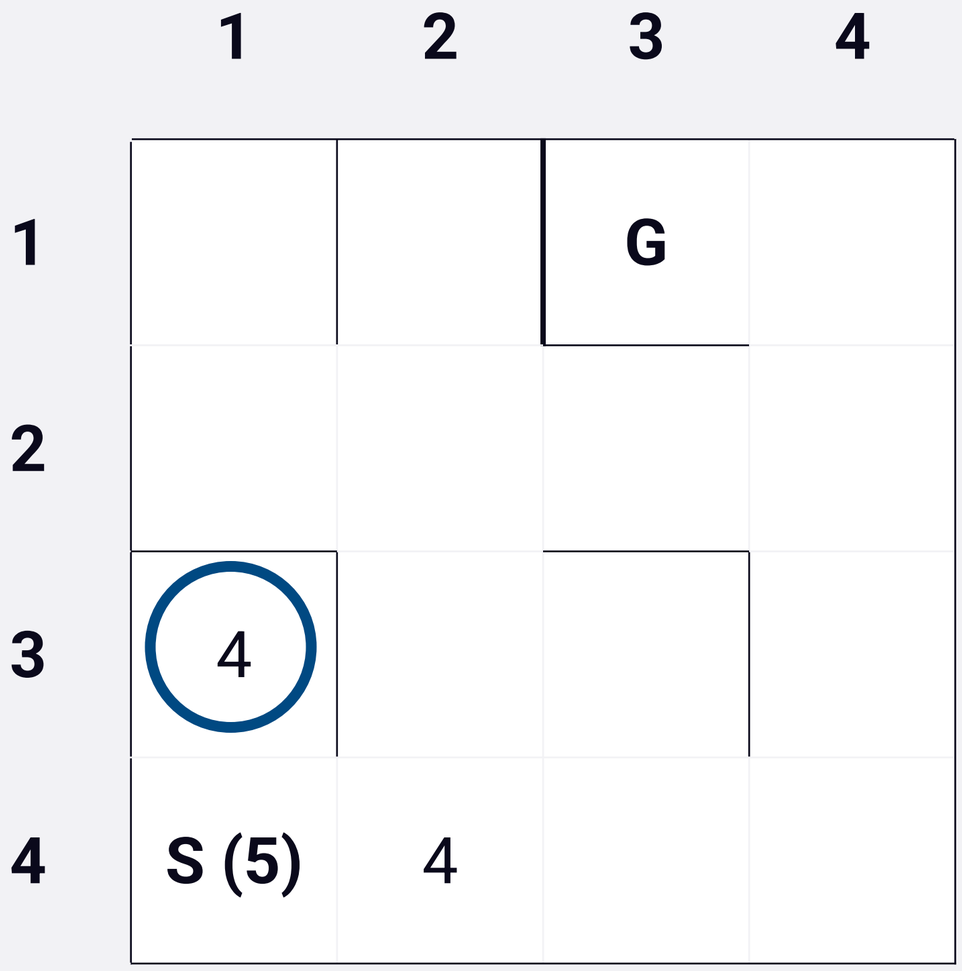

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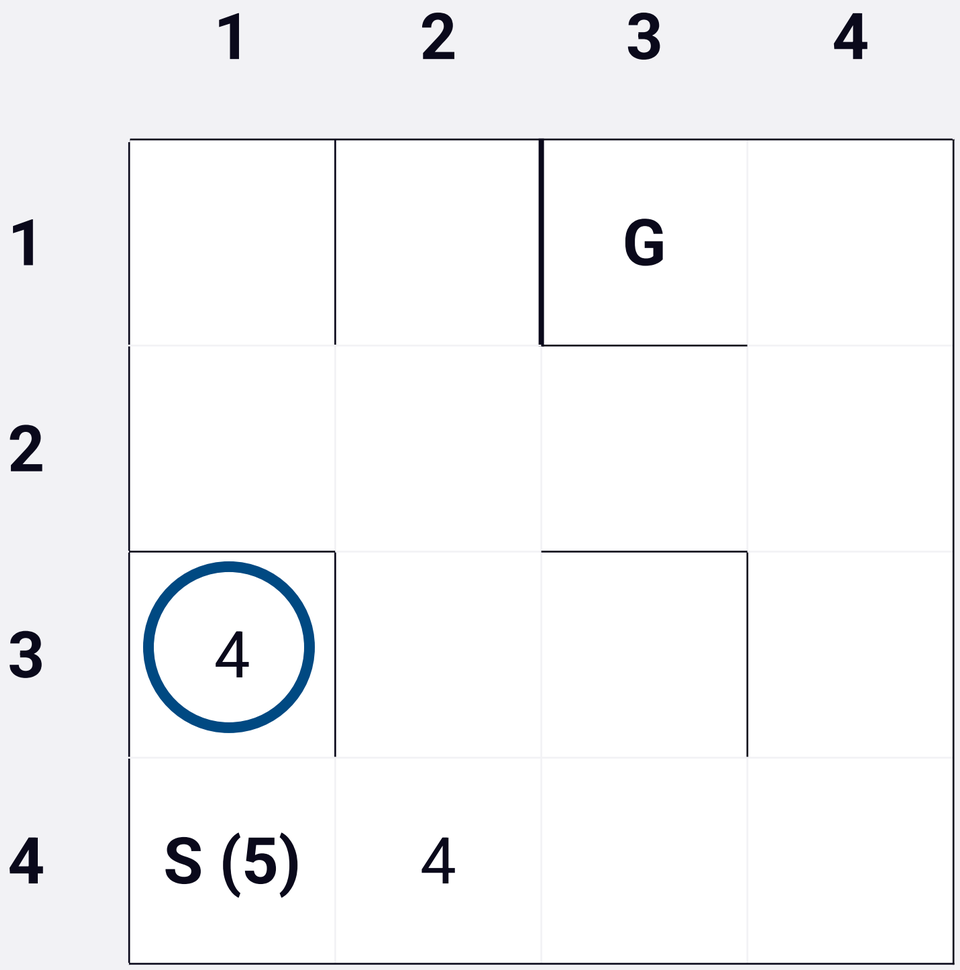

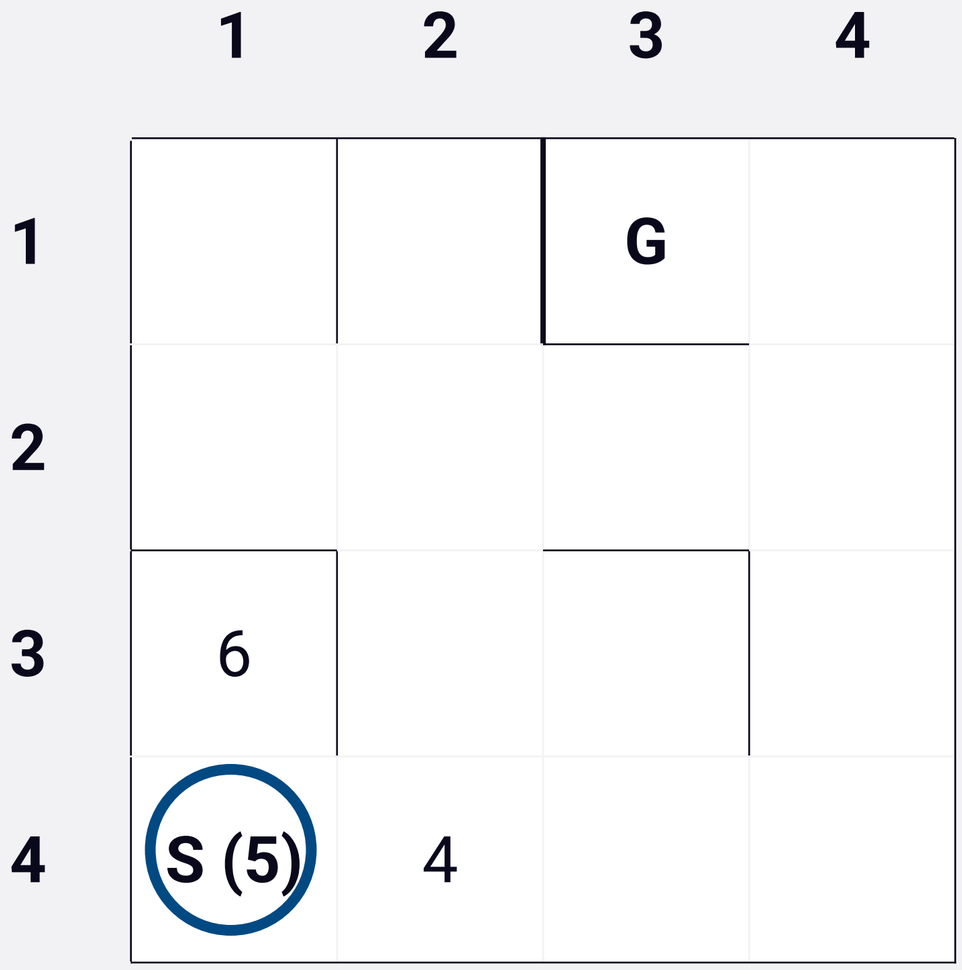

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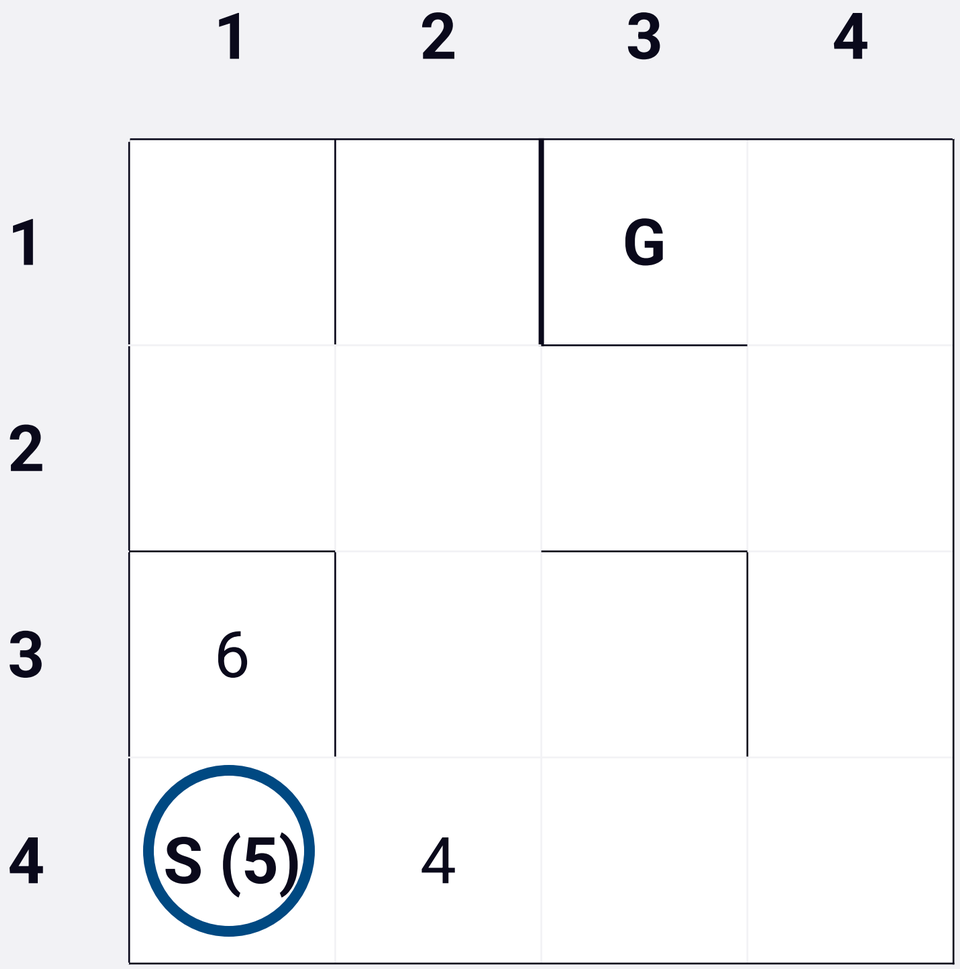

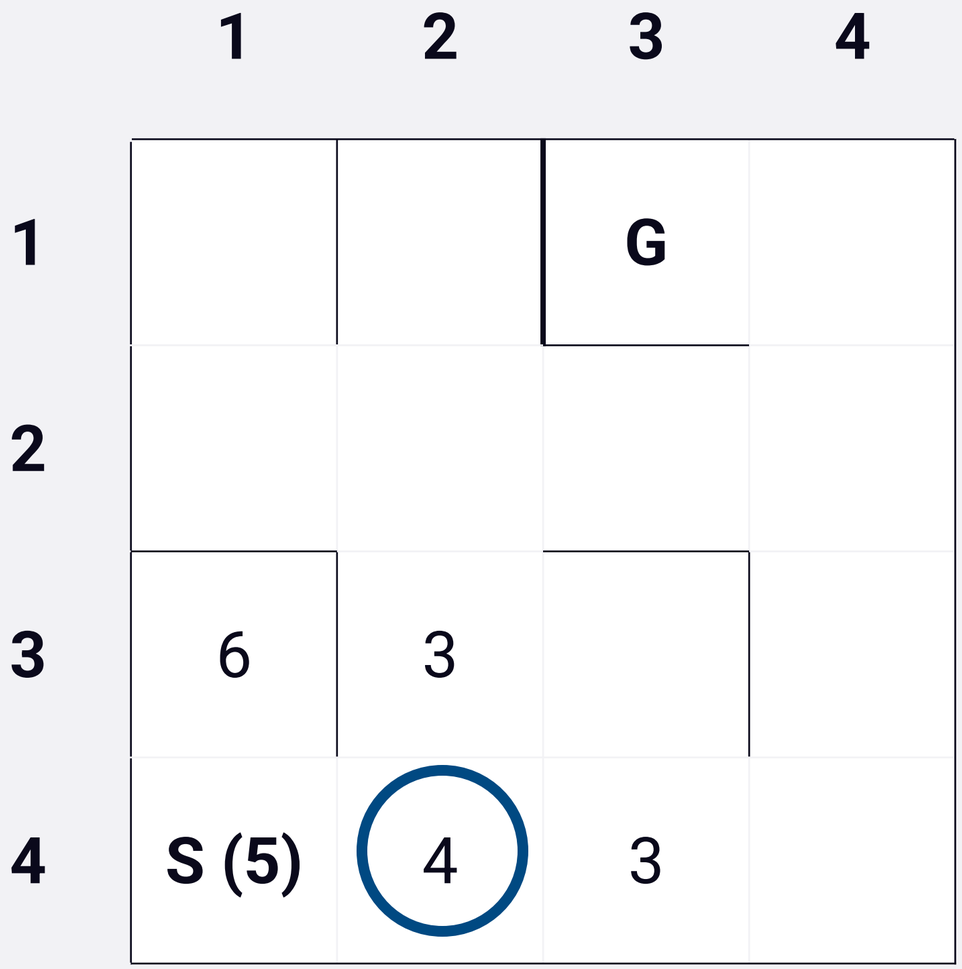

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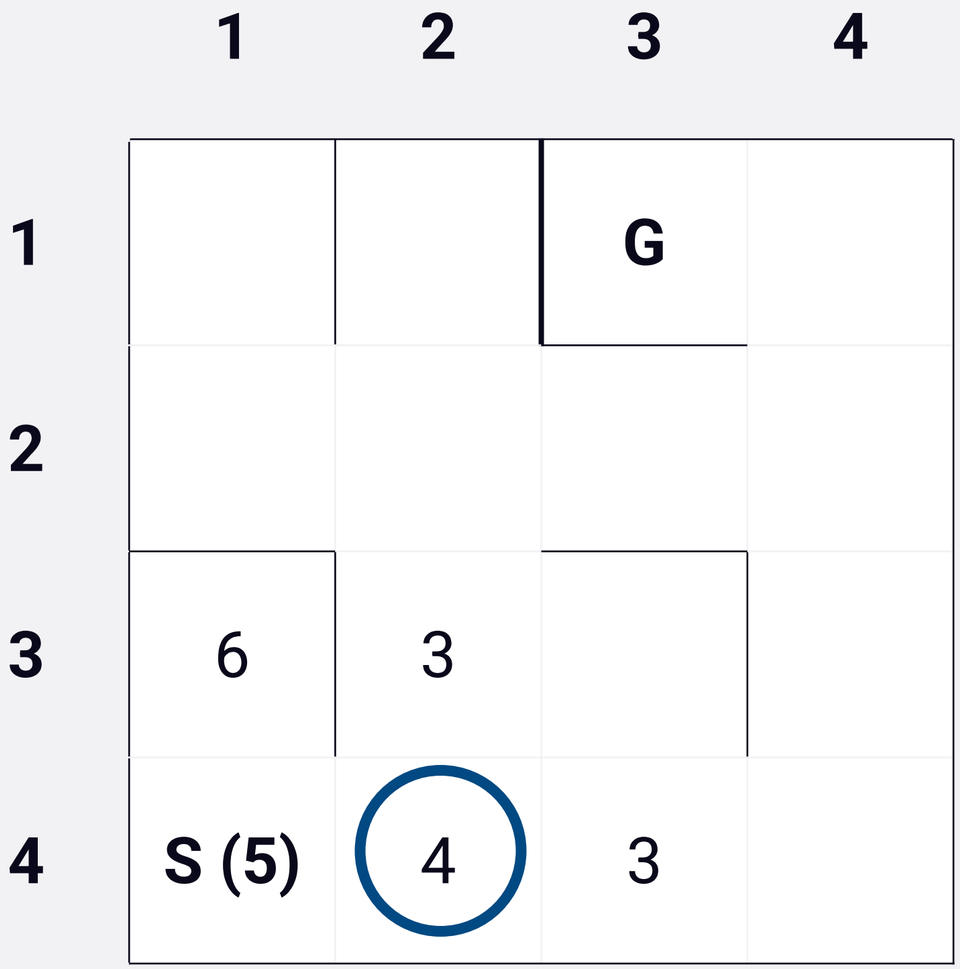

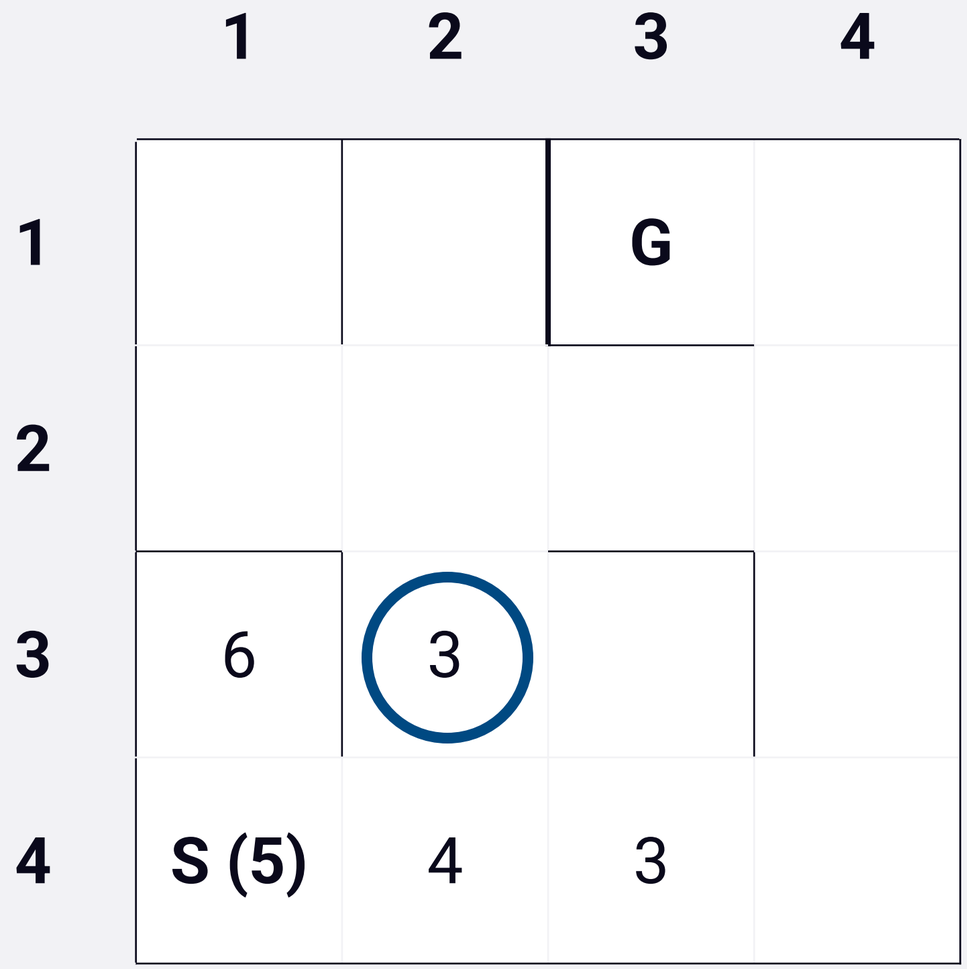

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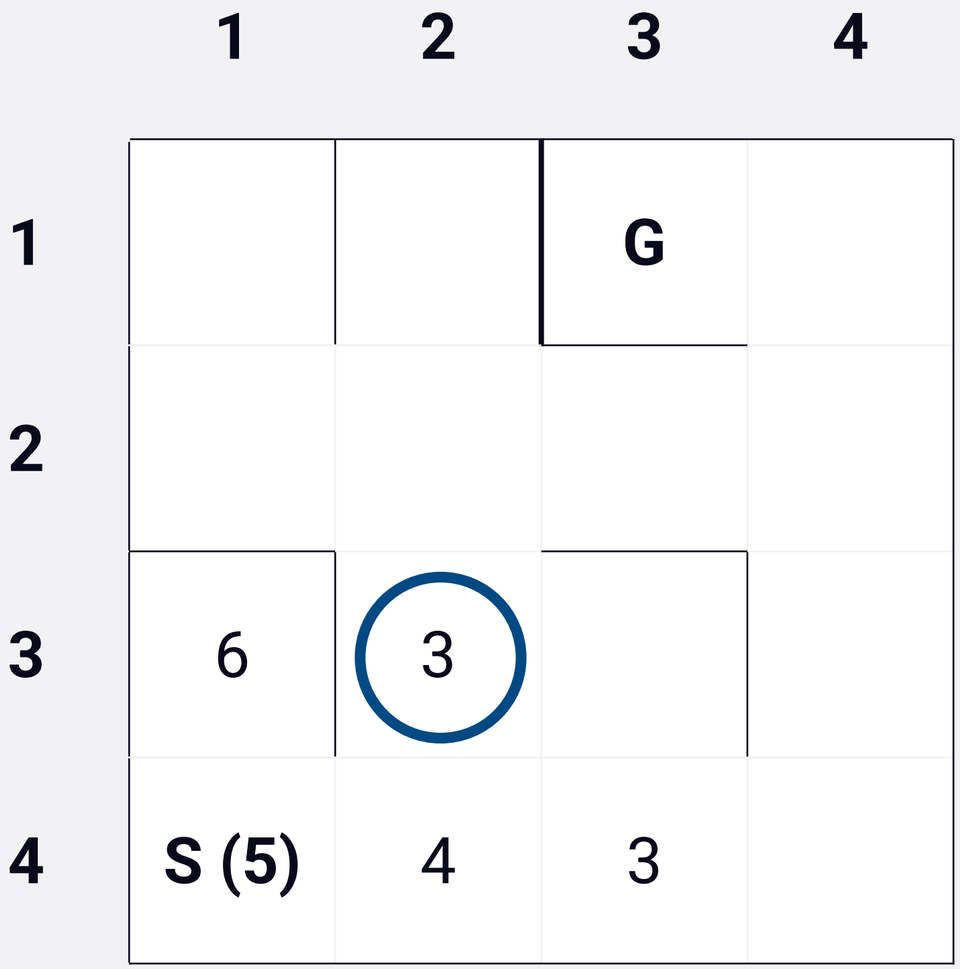

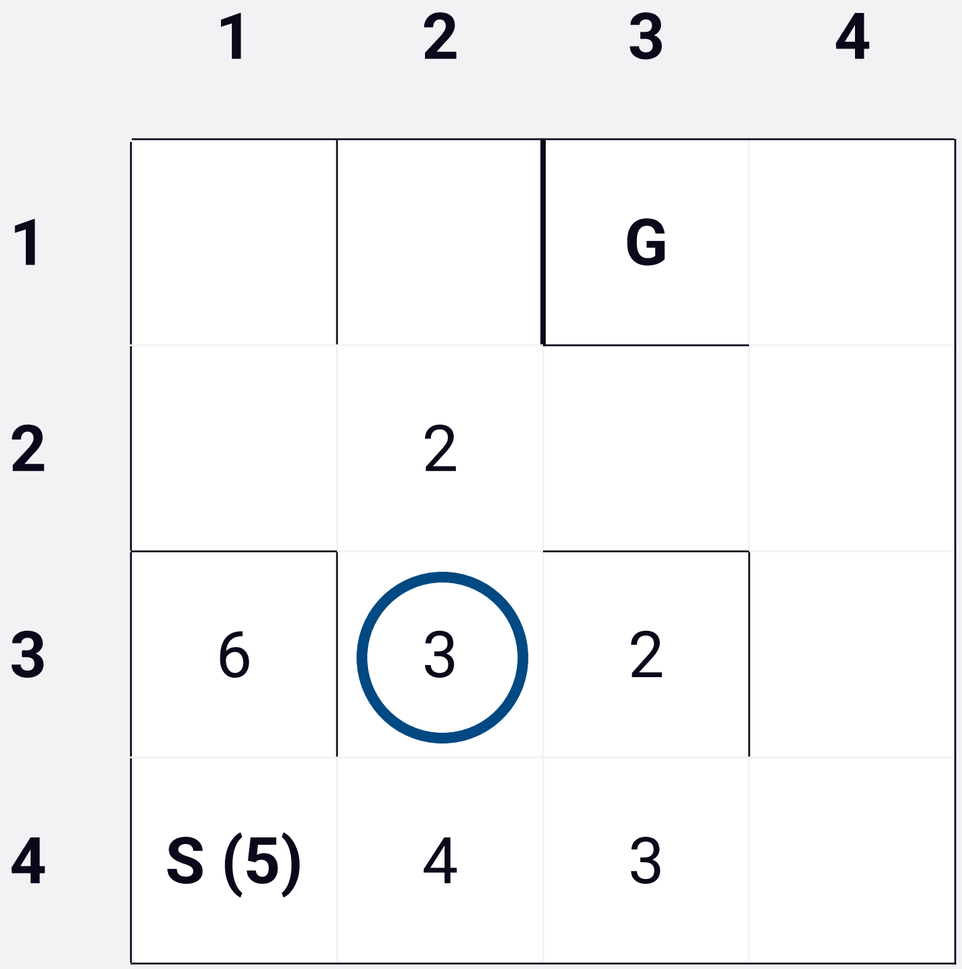

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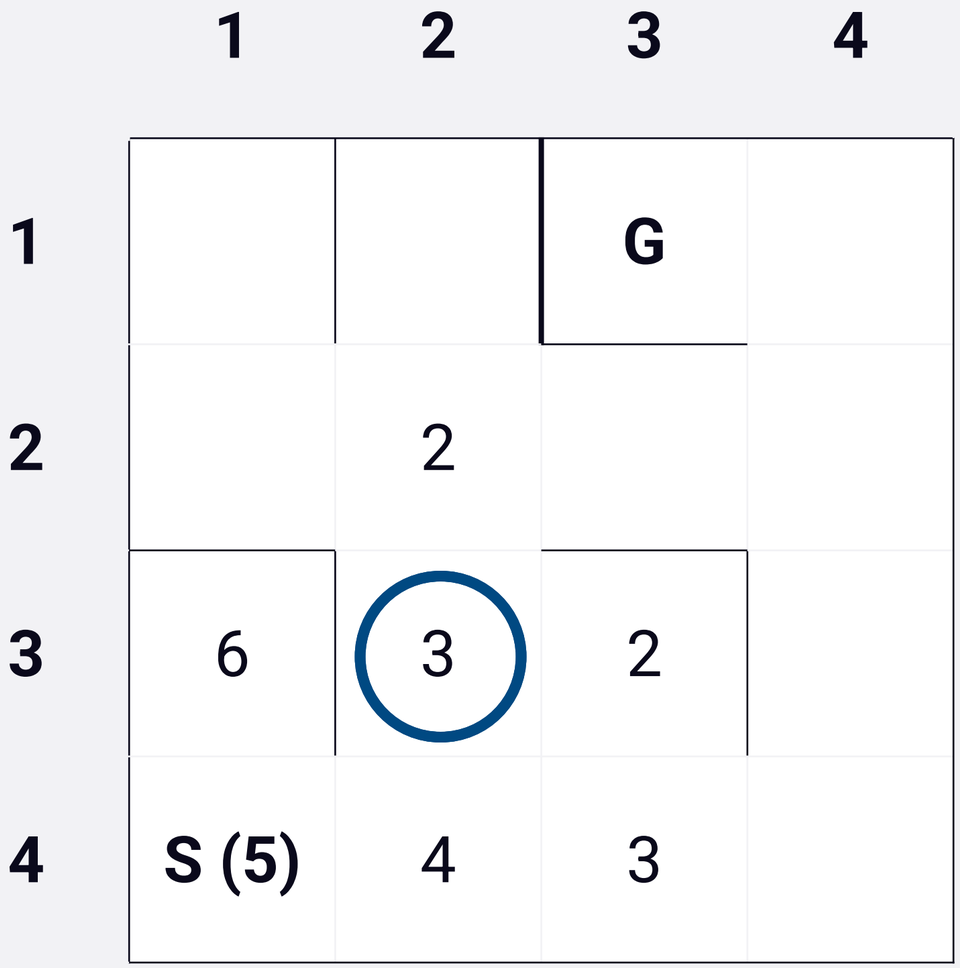

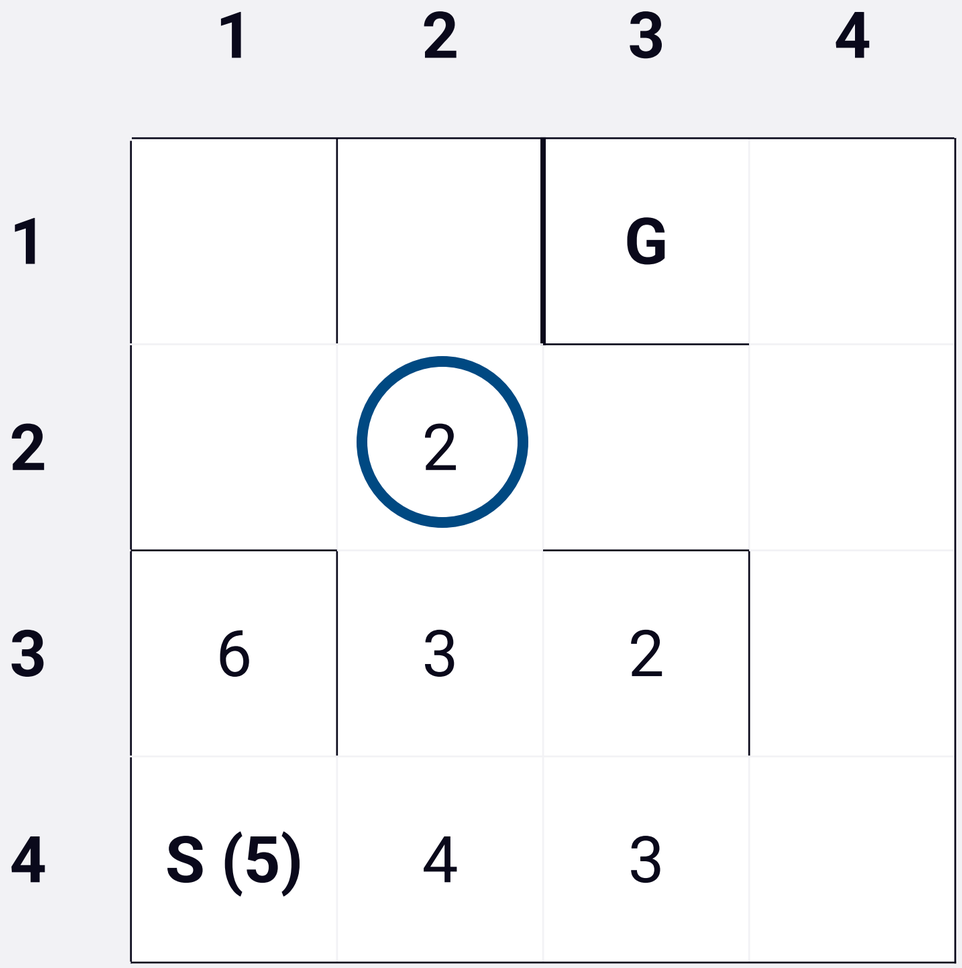

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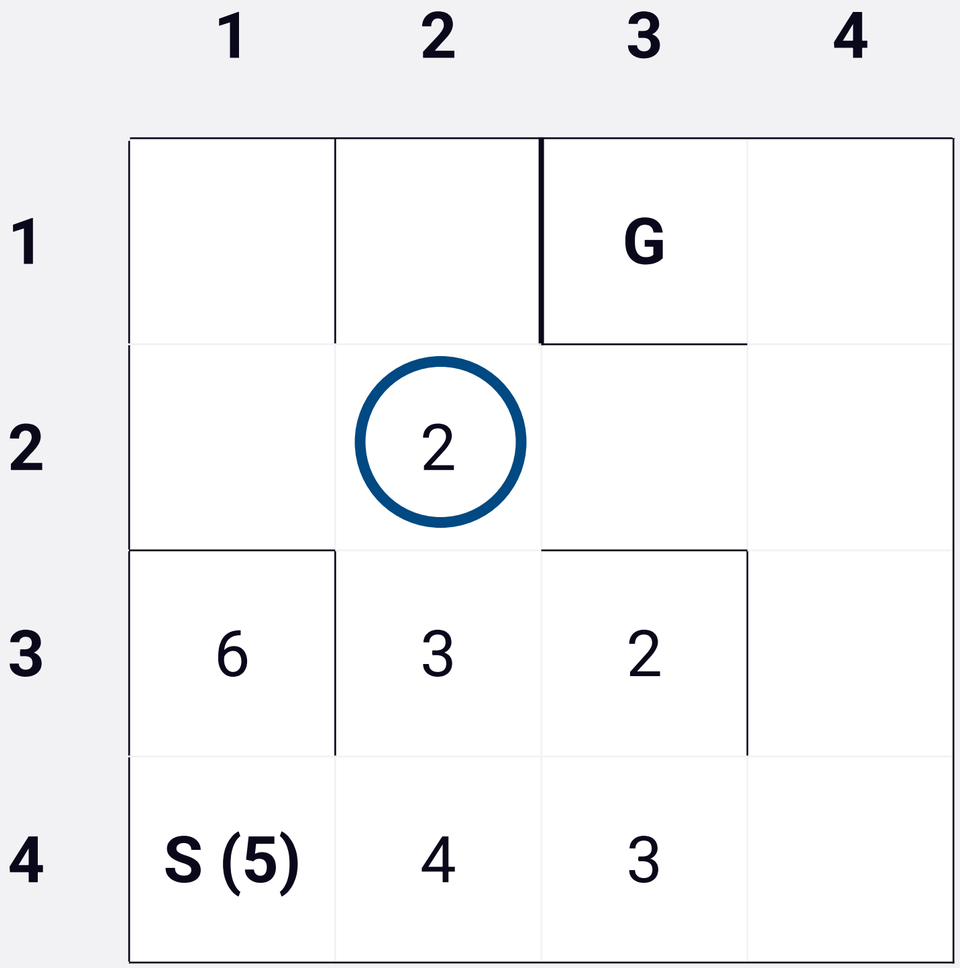

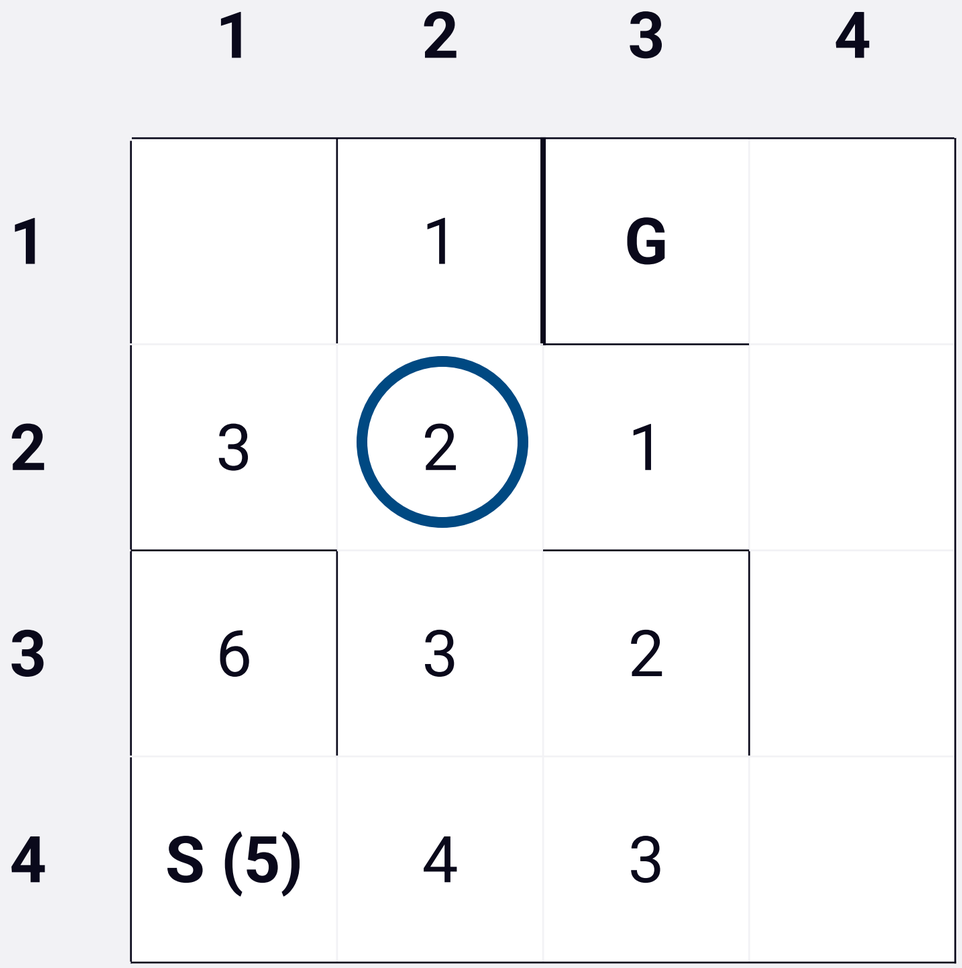

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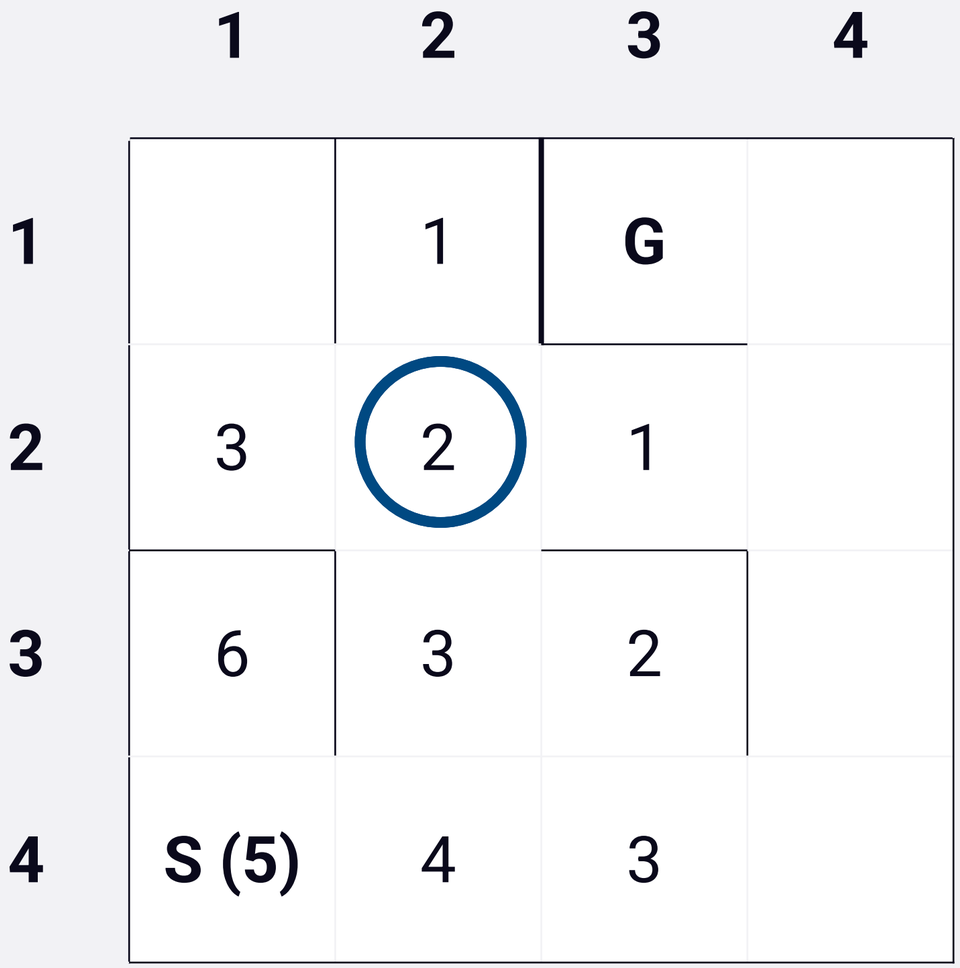

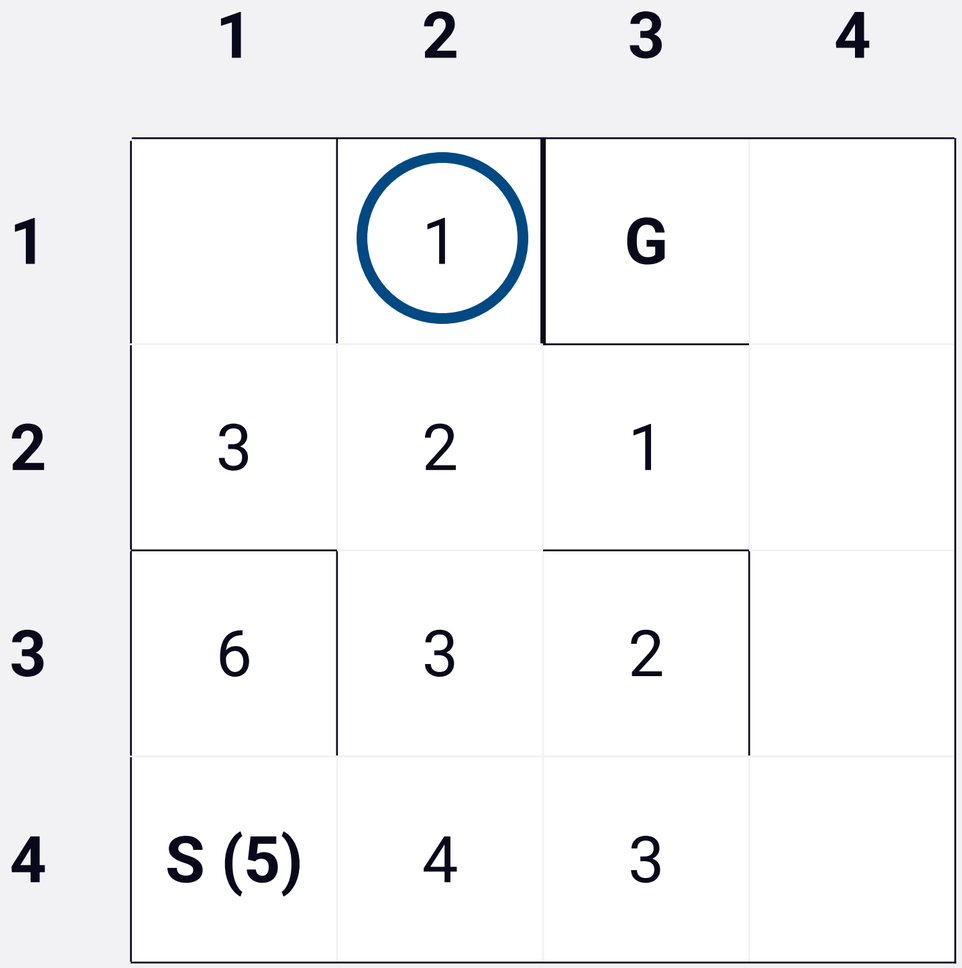

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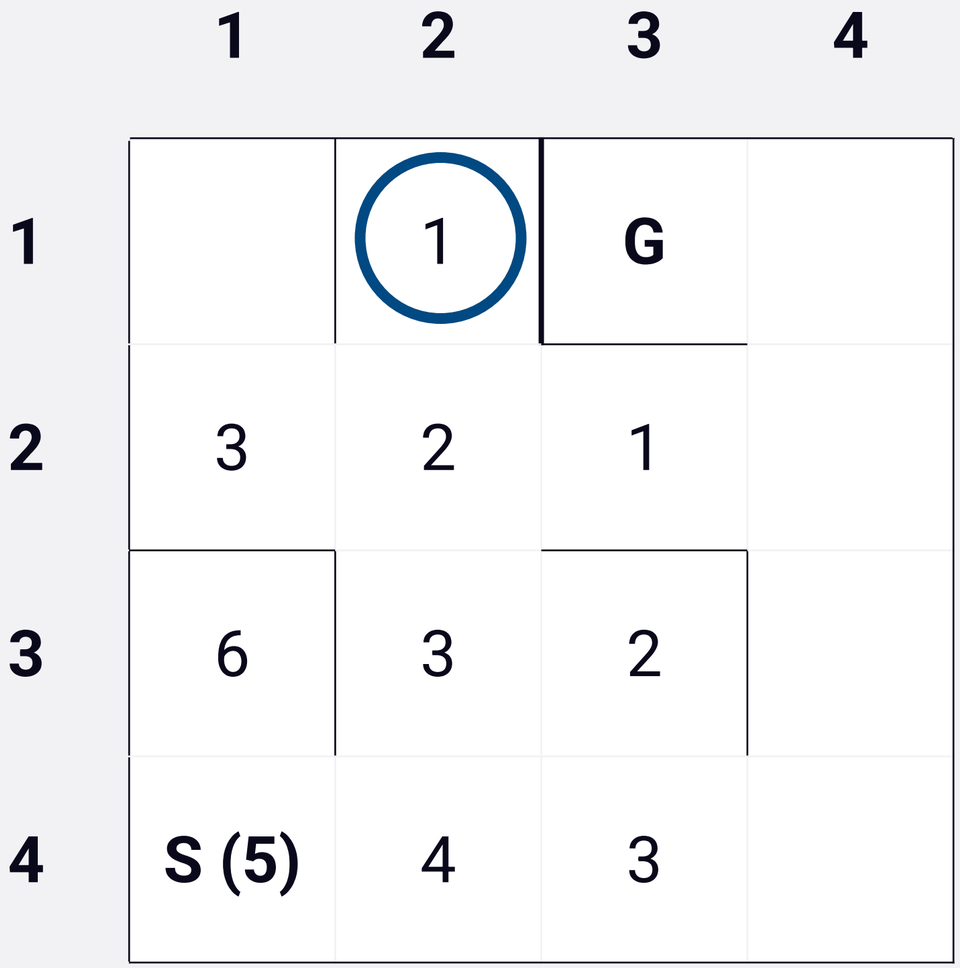

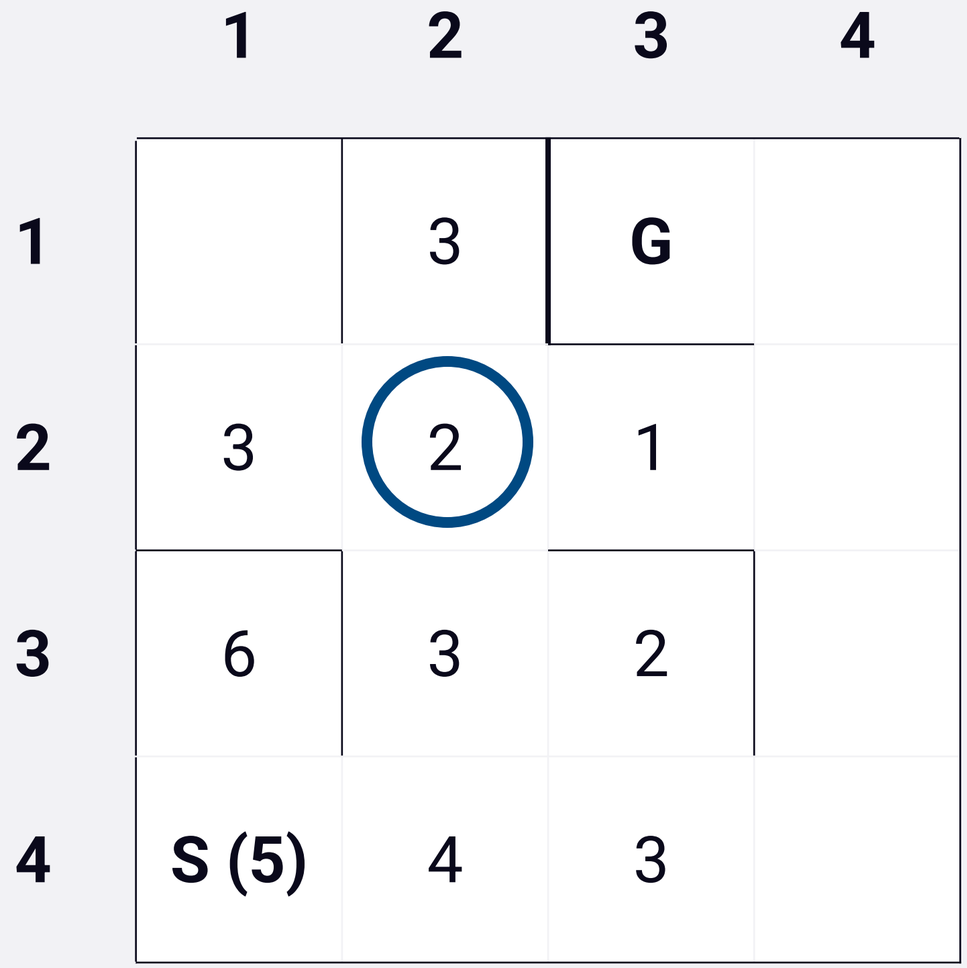

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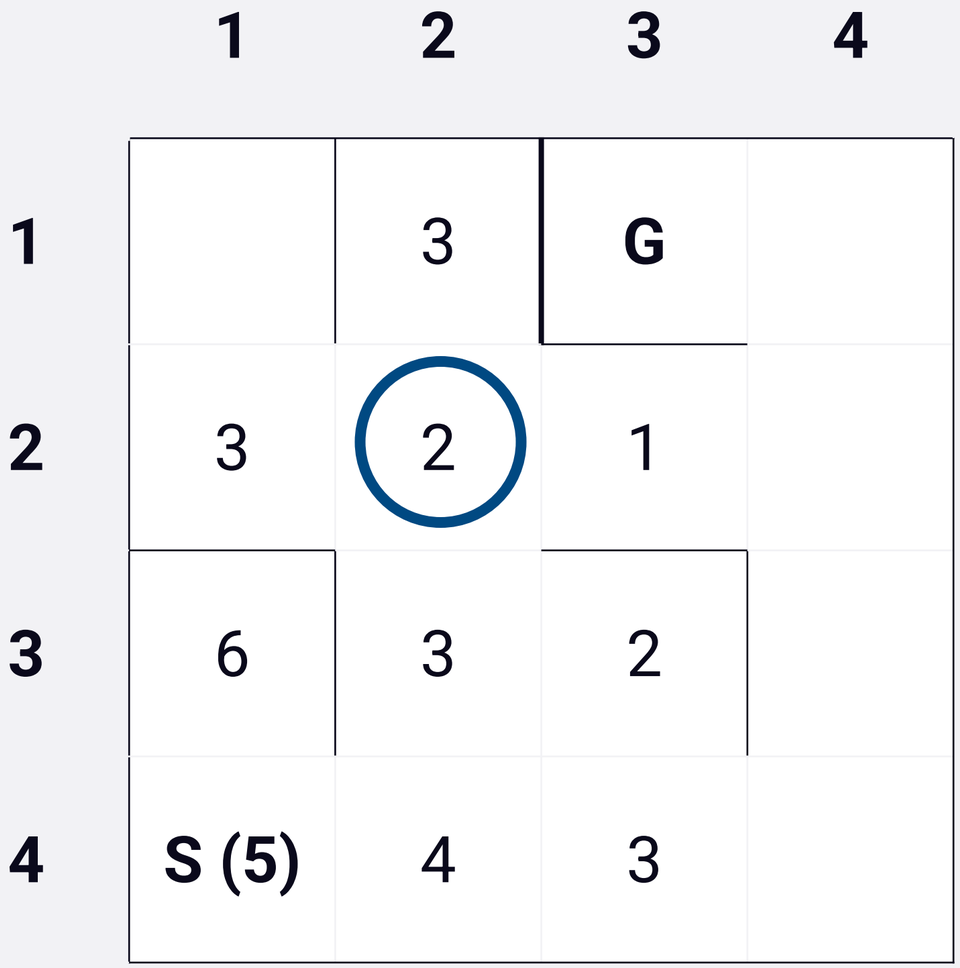

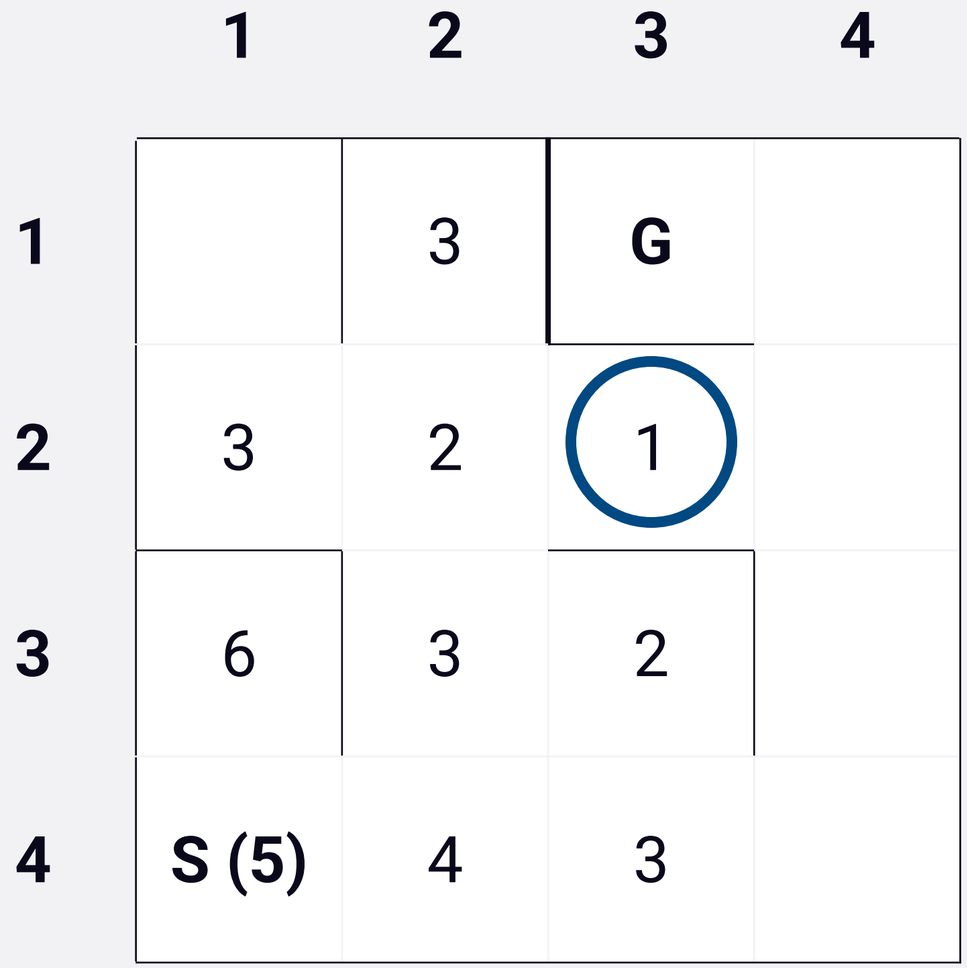

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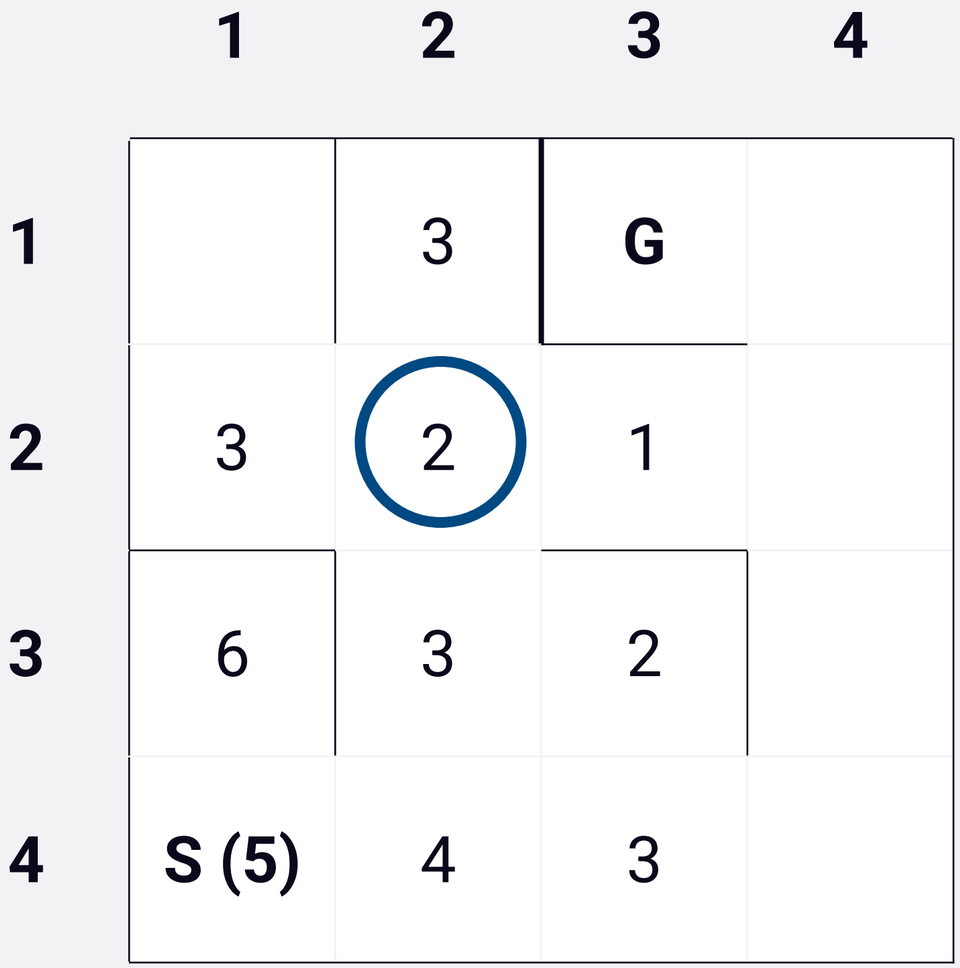

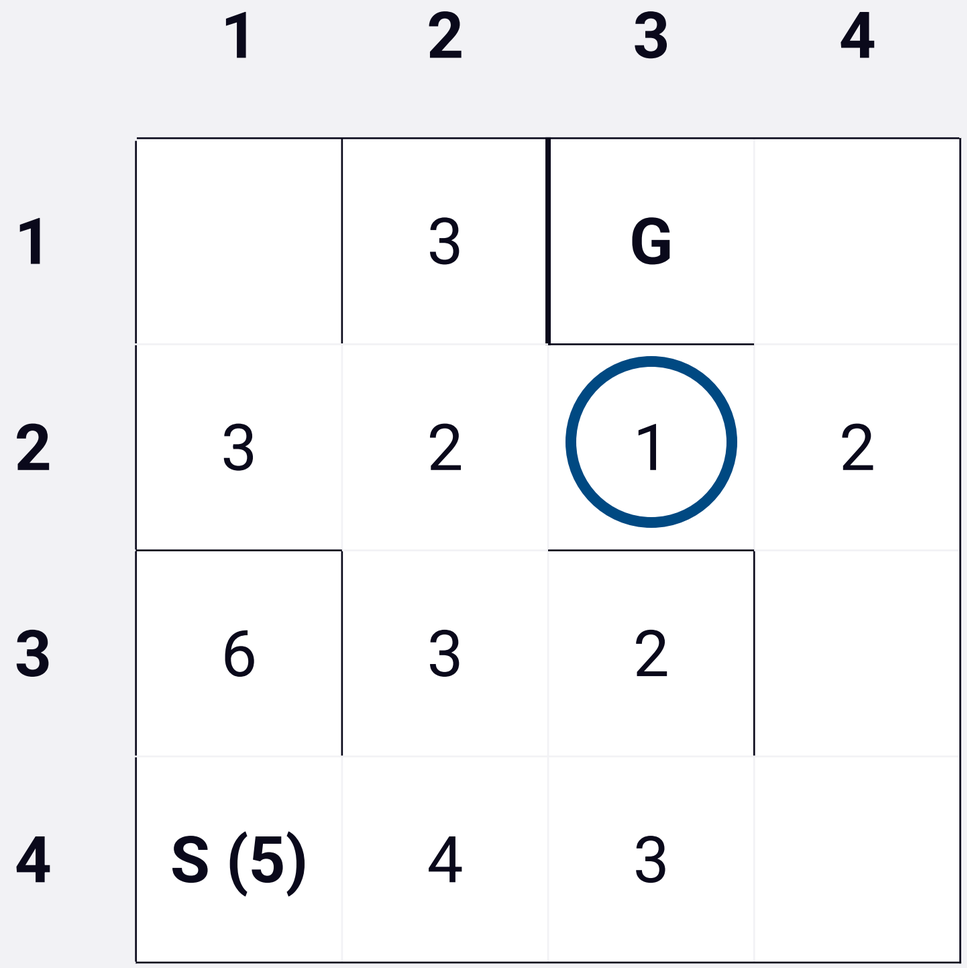

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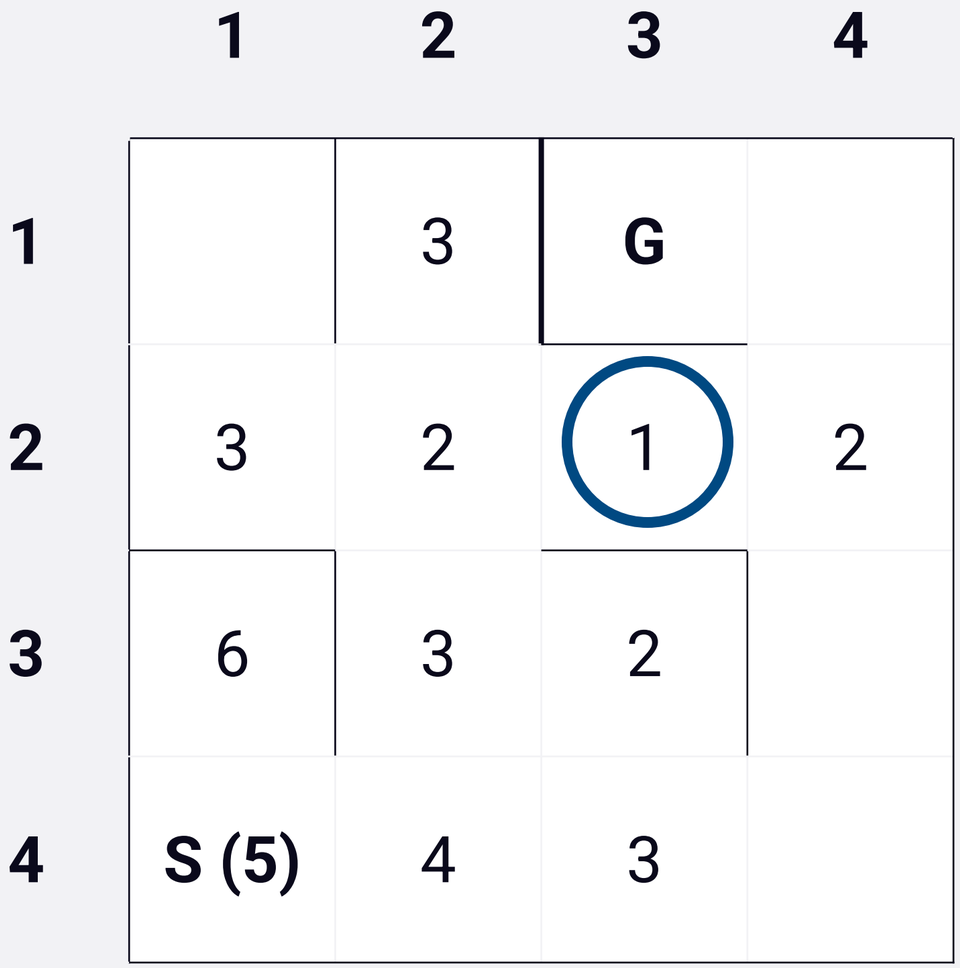

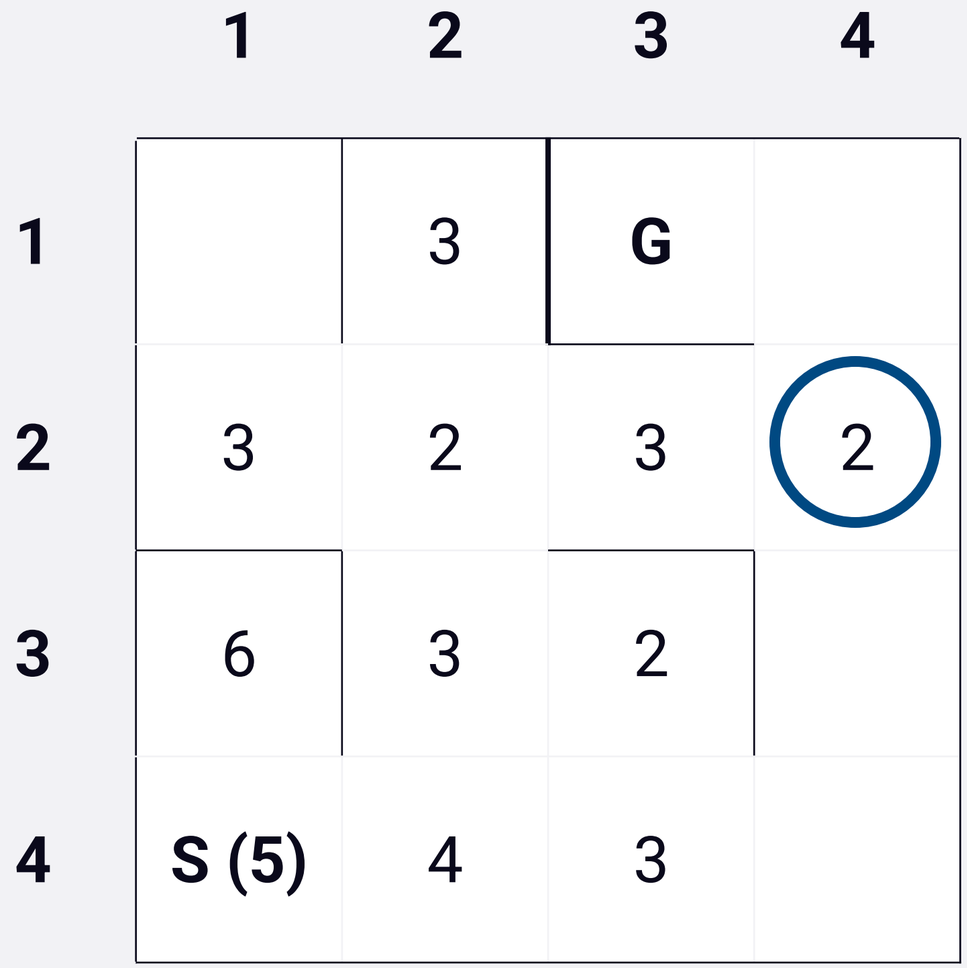

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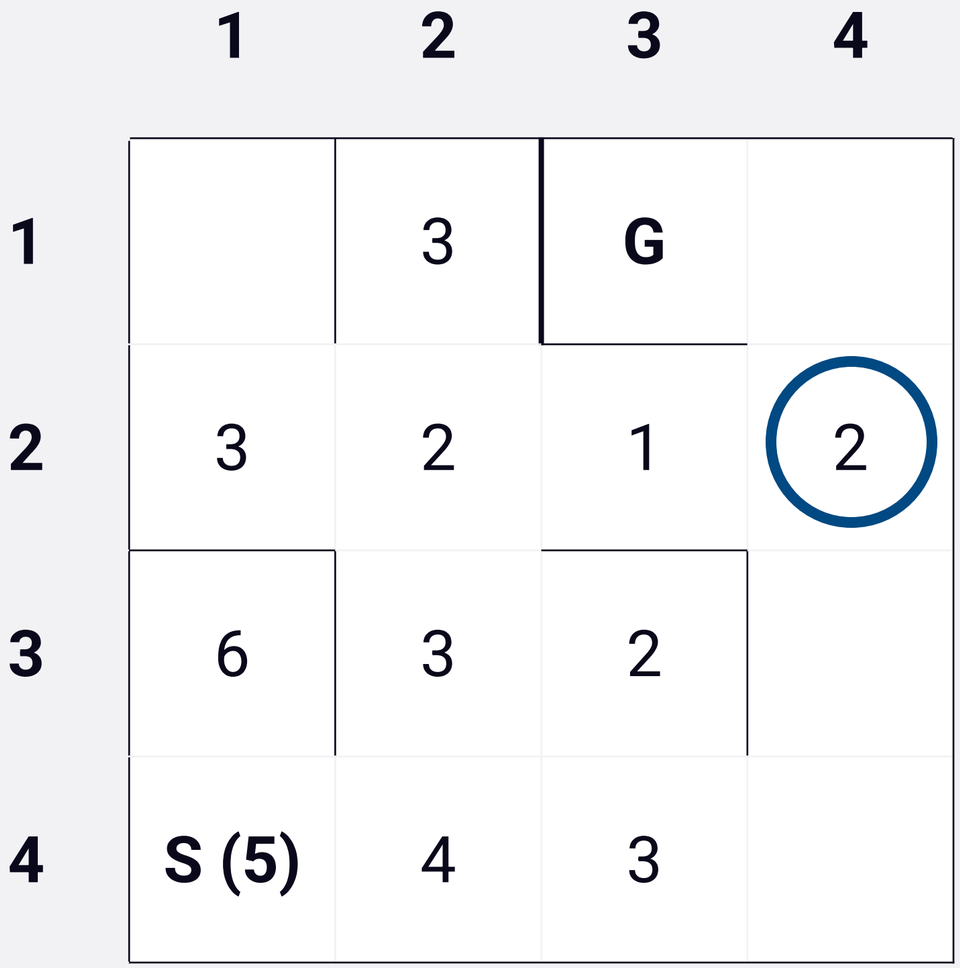
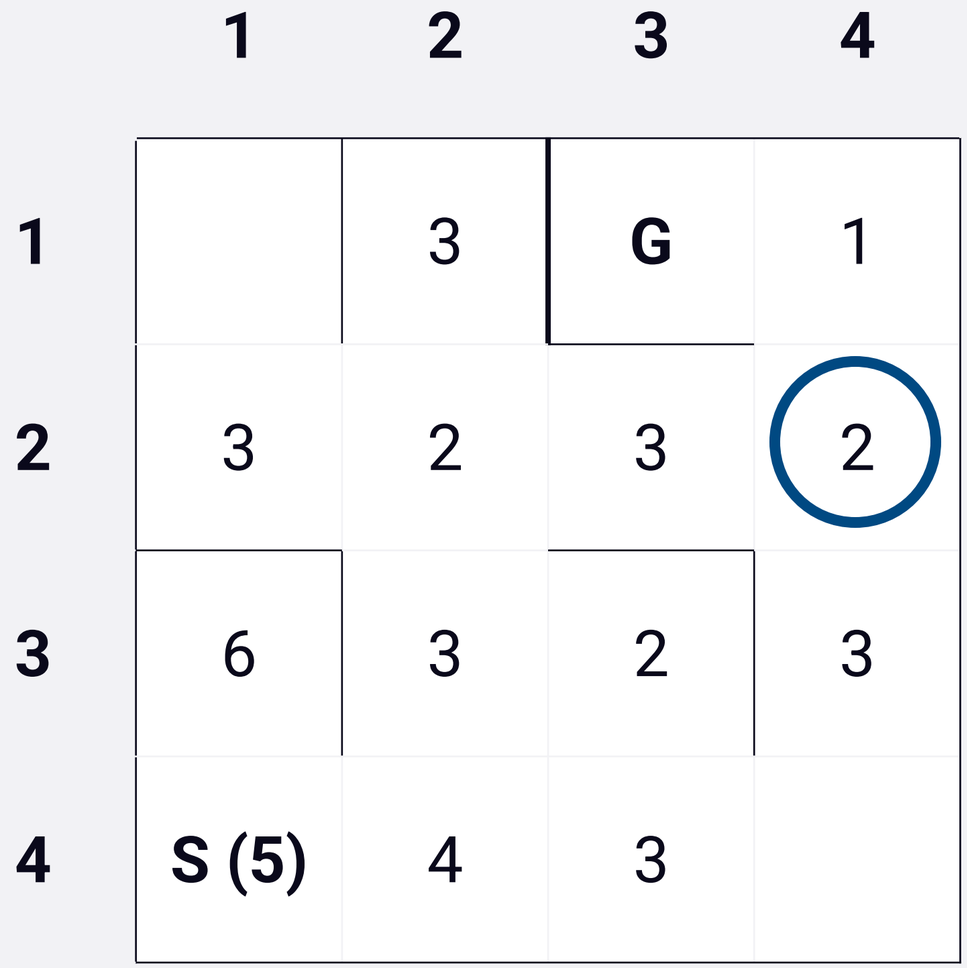




Exercise 5.3

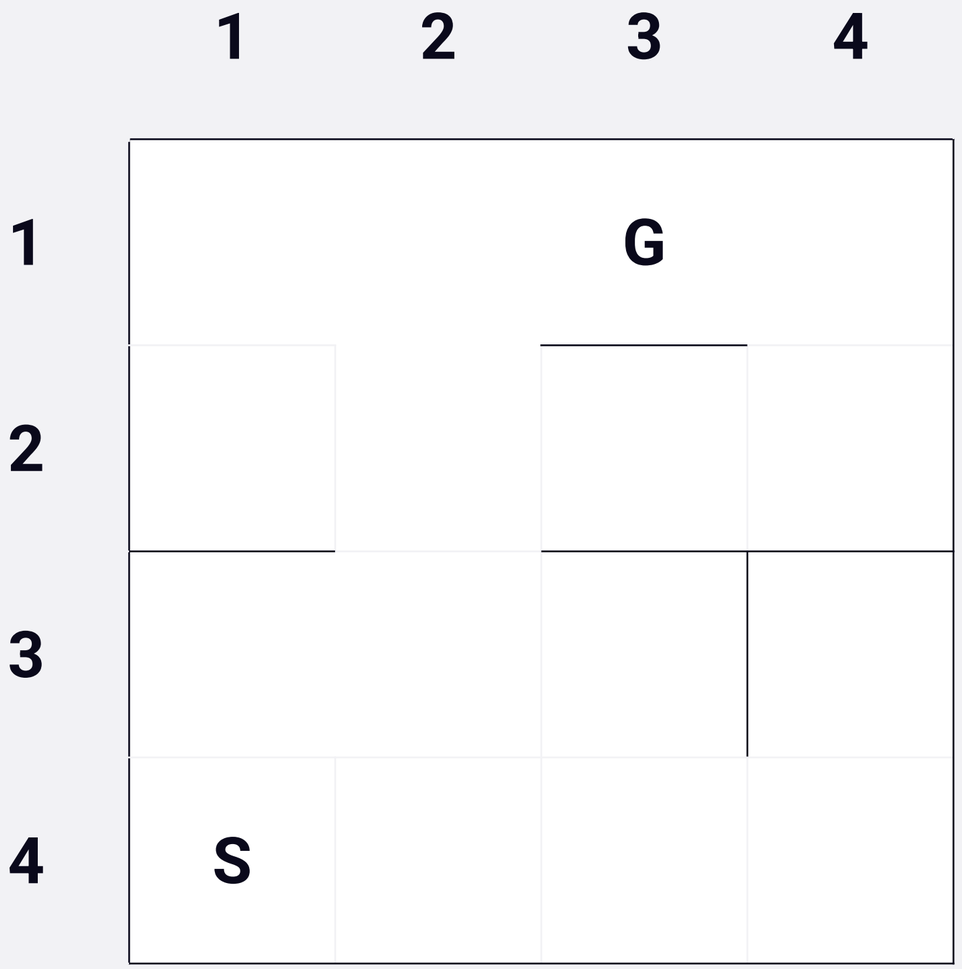
- LRTA*

	1	2	3	4
1		3	**G**	1
2	3	2	1	2
3	6	3	2	3
4	**S (5)**	4	3	

	1	2	3	4
1		3	**G (0)**	1
2	3	2	3	2
3	6	3	2	3
4	**S (5)**	4	3	

Exercise 5.4

- LRTA*

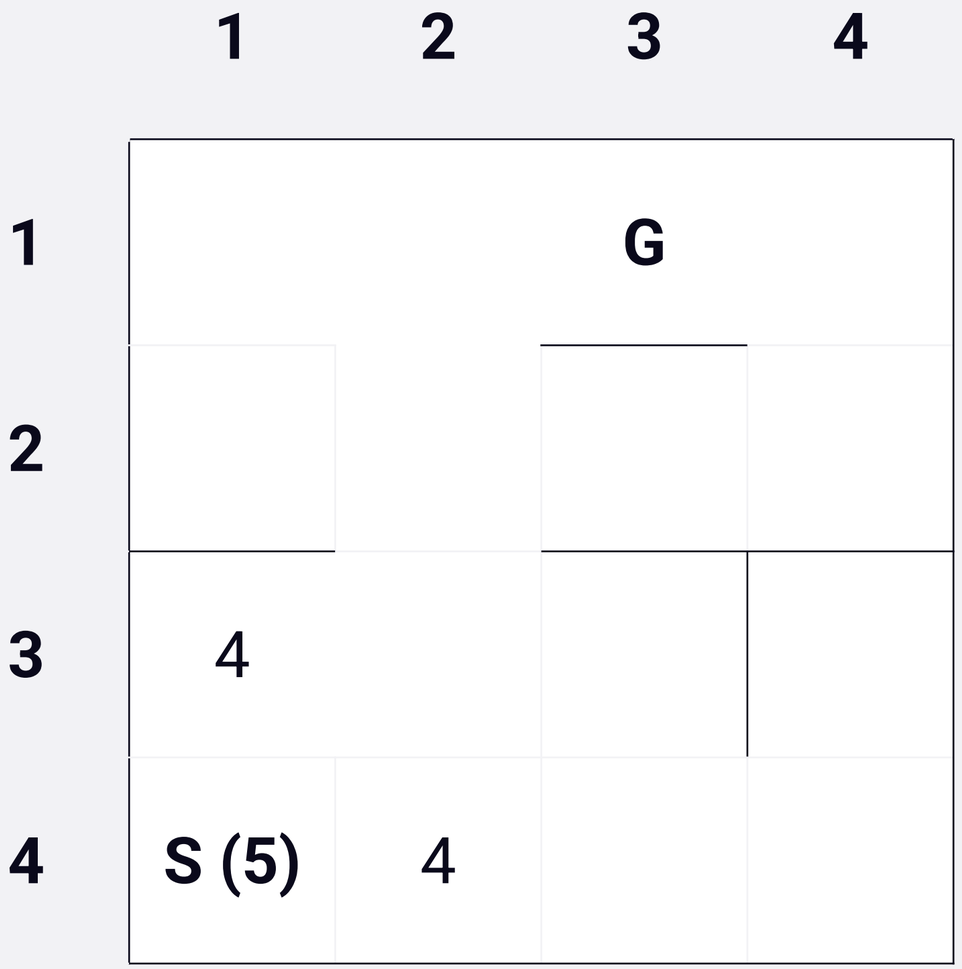


- The agent starts from S, it has to reach G.
  Each step costs:
  2 when UP
  1 otherwise.
  Heuristic is based on Manhattan distance.

- In case of same h(s) values, the order of possible actions are:
  RIGHT, DOWN, UP, LEFT

Exercise 5.4

- LRTA*

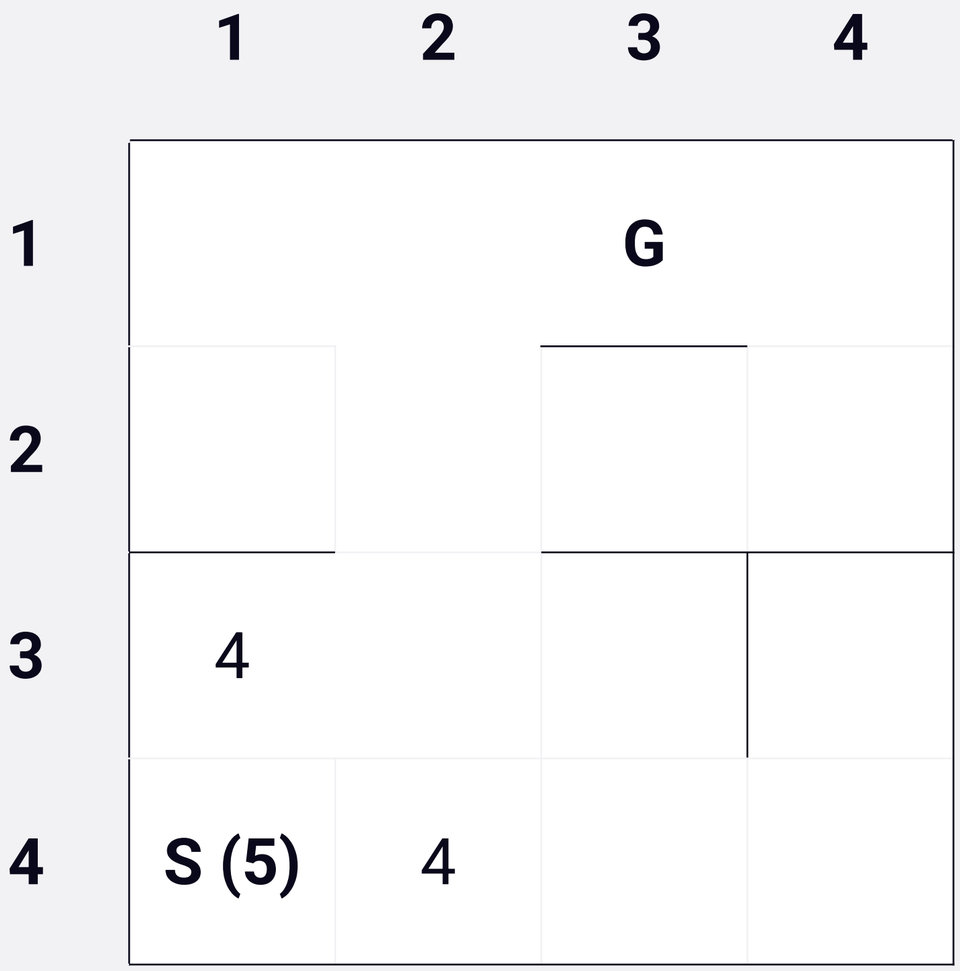


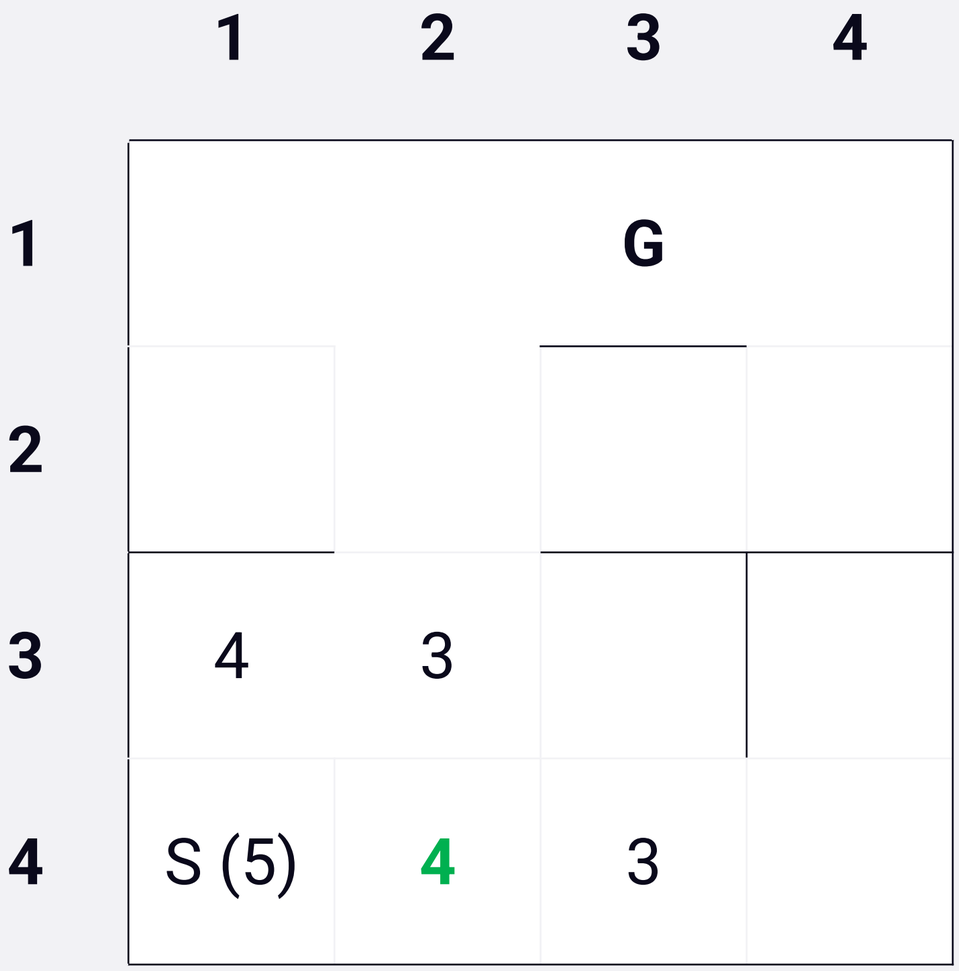
- The agent starts from S, it has to reach G.
  Each step costs:
  2 when UP
  1 otherwise.
  Heuristic is based on Manhattan distance.

- In case of same h(s) values, the order of possible actions are:
  RIGHT, DOWN, UP, LEFT

Exercise 5.4

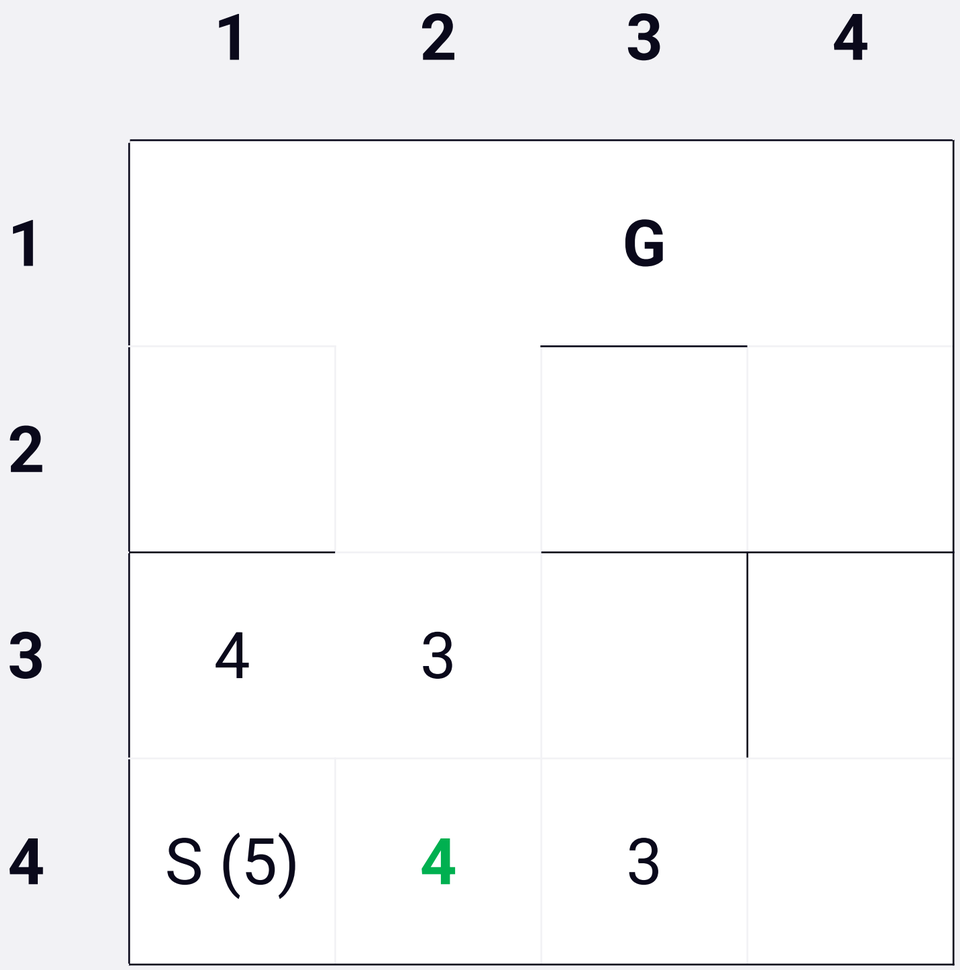
- LRTA*

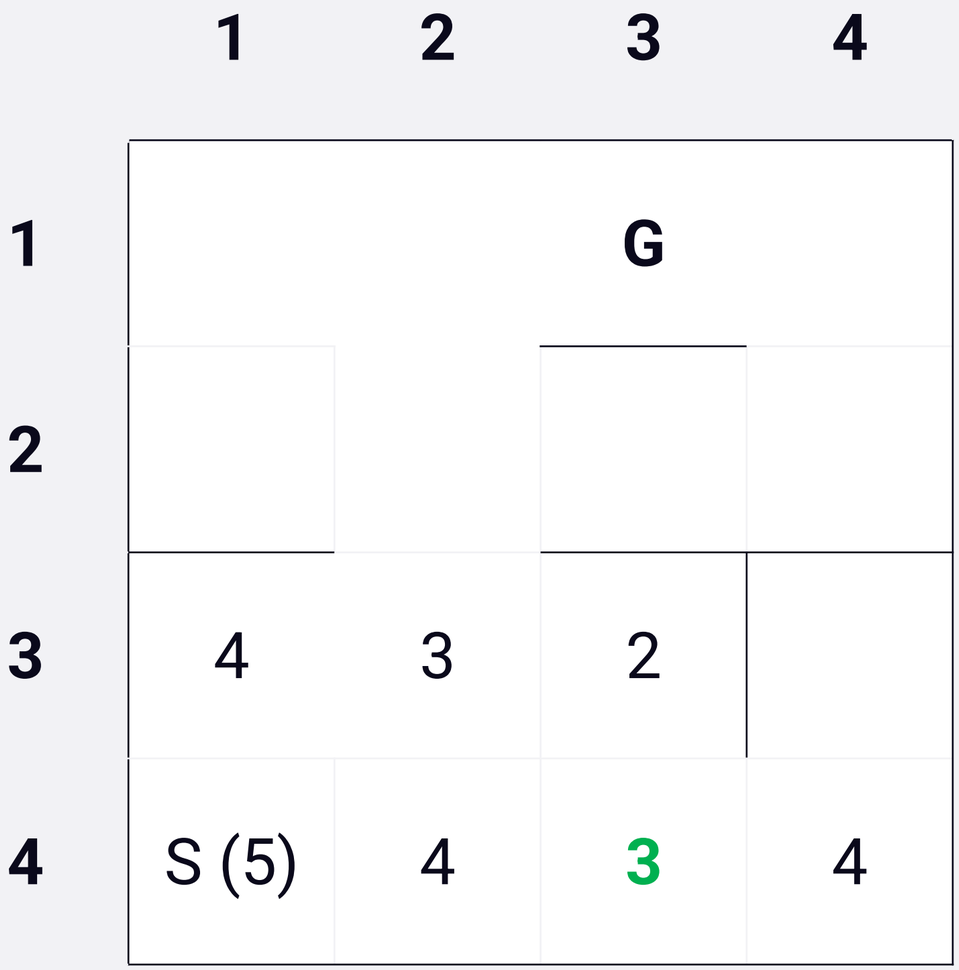




Exercise 5.4

- LRTA*





Exercise 5.4

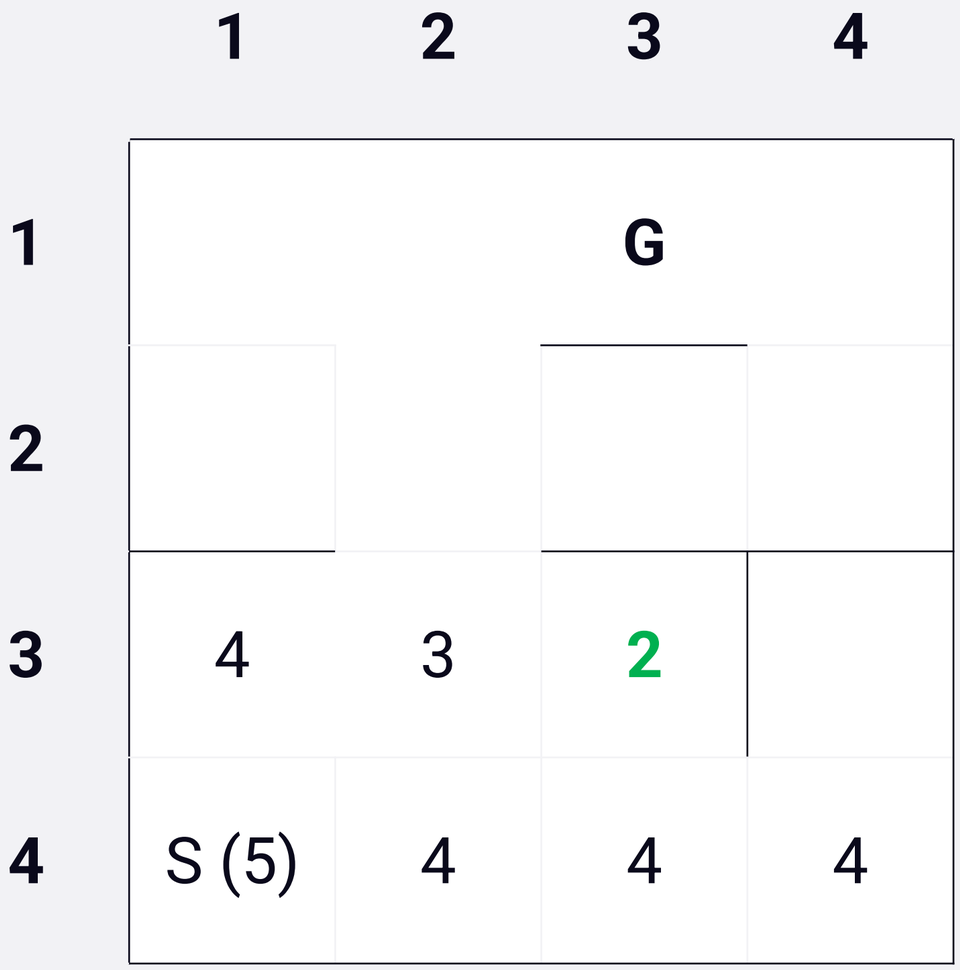
- LRTA*

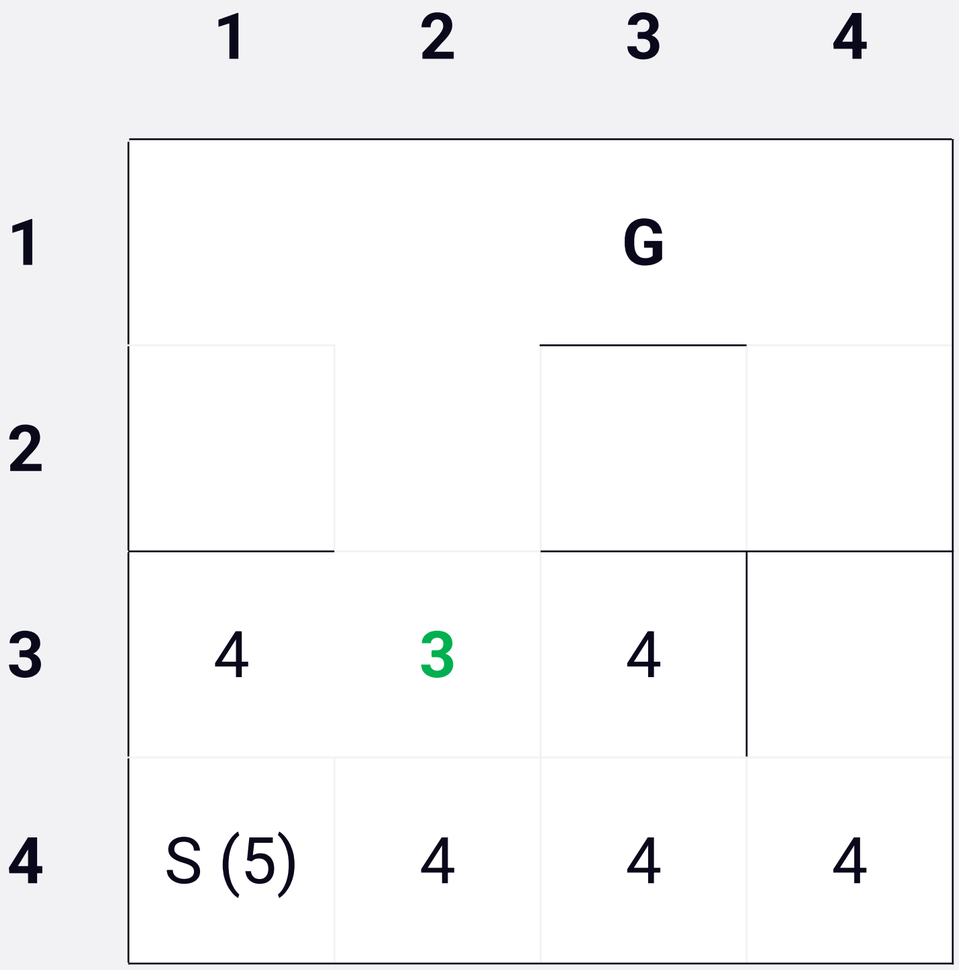
	1	2	3	4
1			G	
2				
3	4	3	2	
4	S (5)	4	3	4

	1	2	3	4
1			G	
2				
3	4	3	2	
4	S (5)	4	4	4

Exercise 5.4

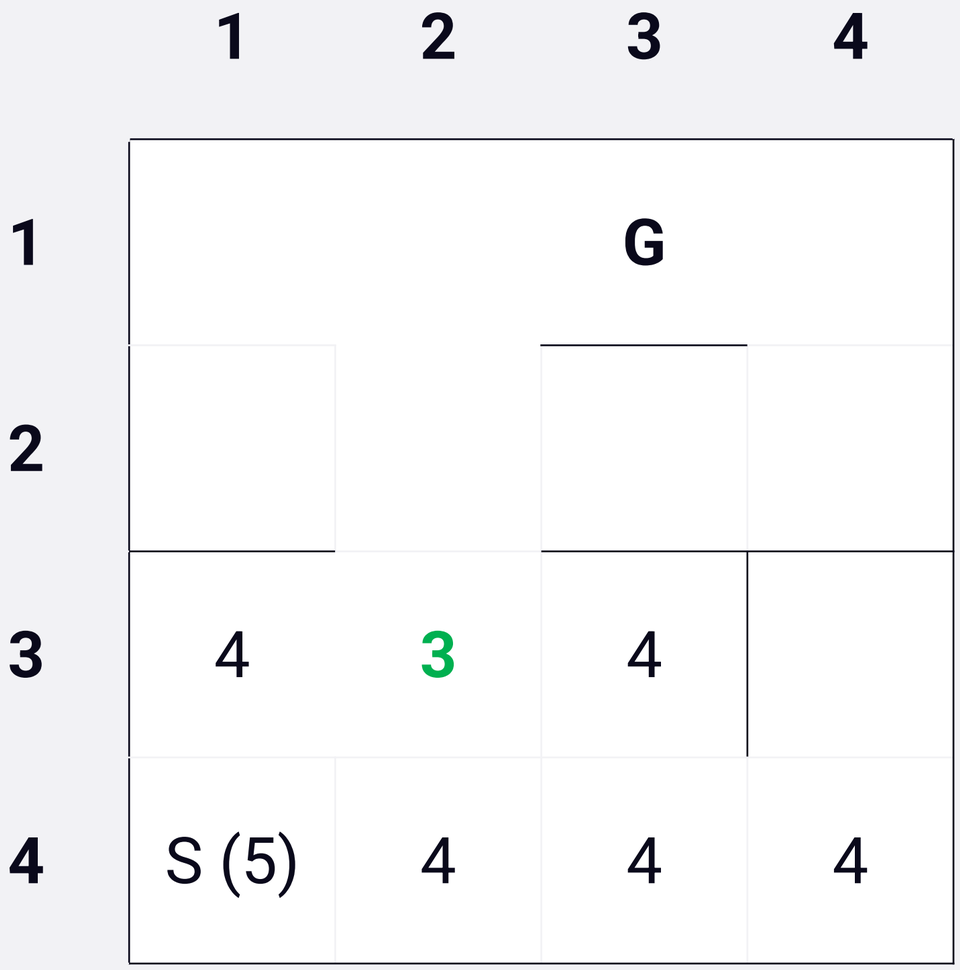
- LRTA*

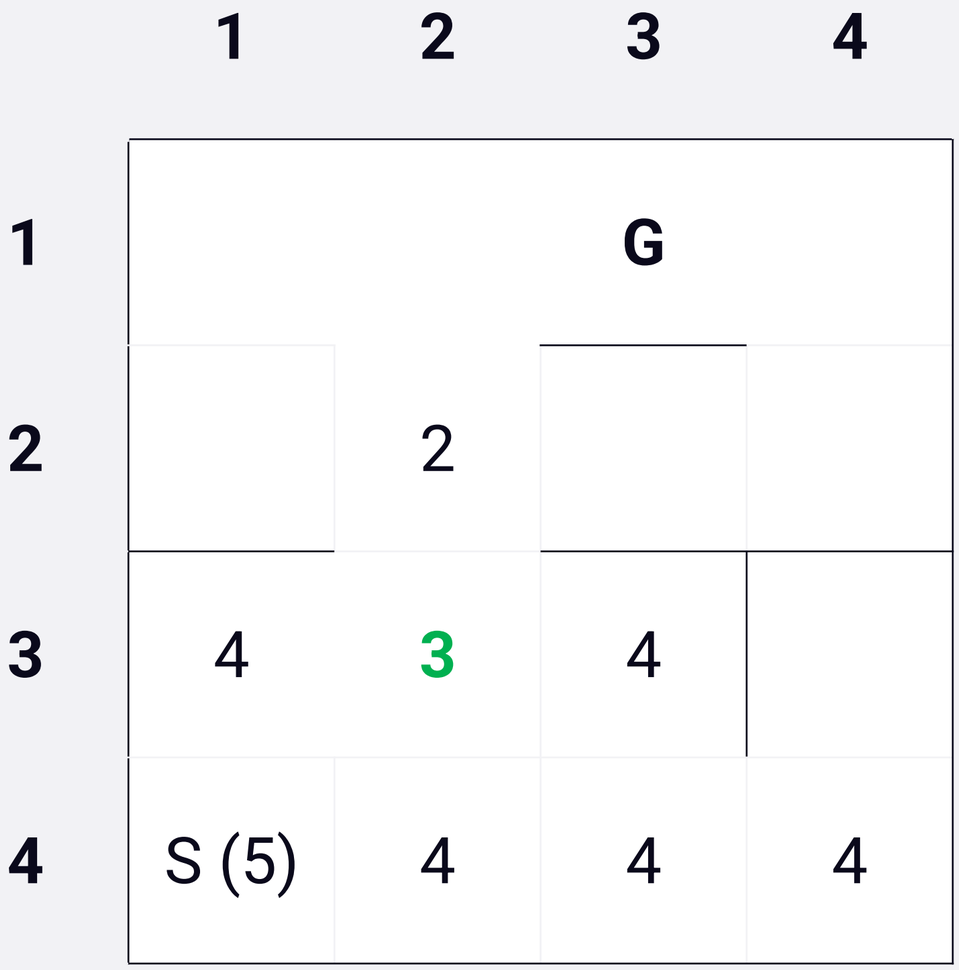




Exercise 5.4

- LRTA*





Exercise 5.4

- LRTA*

	1	2	3	4
1			**G**	
2		2		
3	4	**3**	4	
4	S (5)	4	4	4

- The agent starts from S, it has to reach G.
  Each step costs:
  2 when UP
  1 otherwise.
  Heuristic is based on Manhattan distance.

- In case of same h(s) values, the order of possible actions are:
  RIGHT, DOWN, UP, LEFT

Exercise 5.4

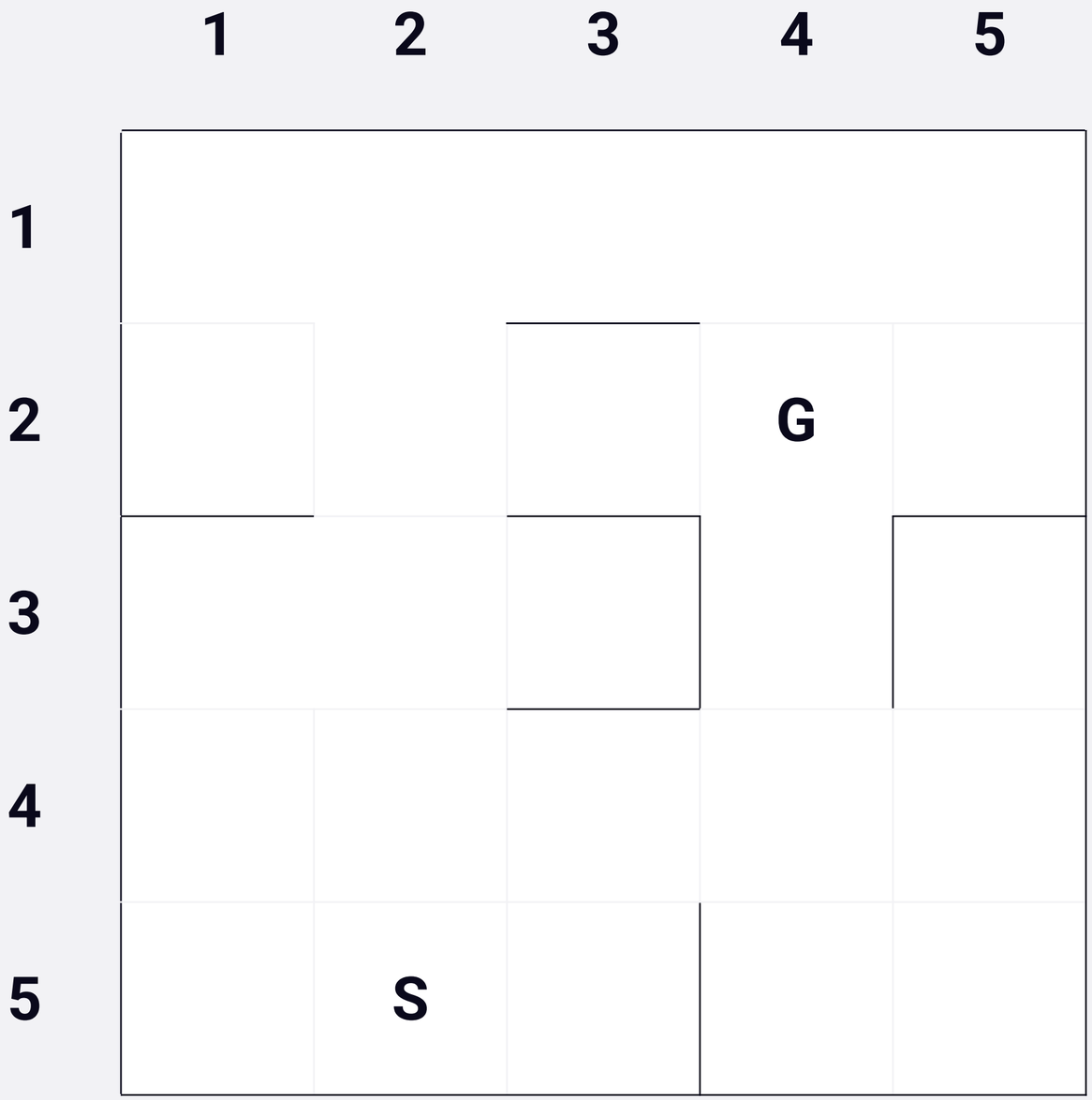
- LRTA*

	1	2	3	4
1			G	
2		2		
3	4	3	4	
4	S (5)	4	4	4

	1	2	3	4
1		1	G	1
2	3	2	3	3
3	4	4	4	
4	S (5)	4	4	4

Exercise 5.5

- LRTA*

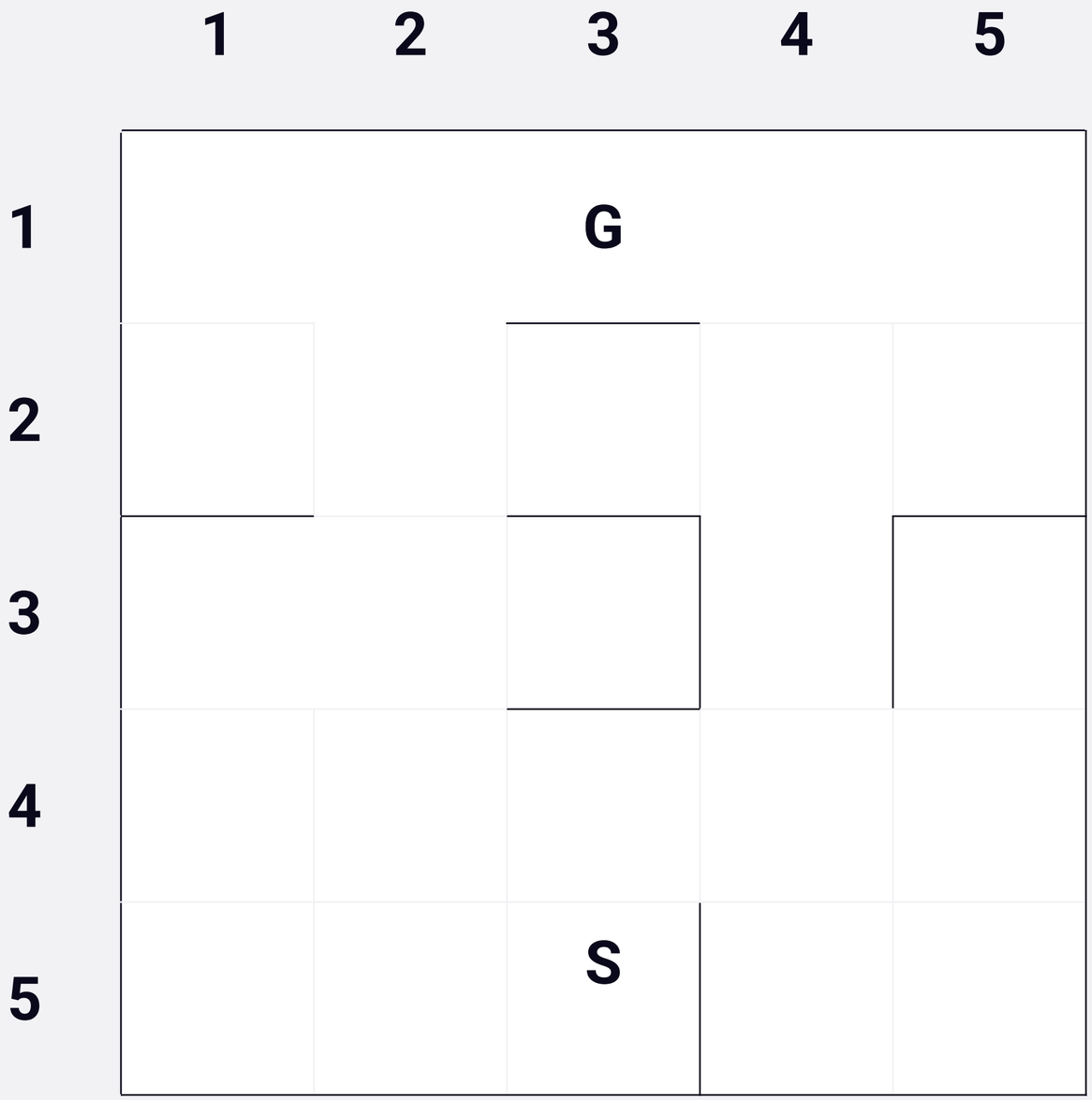


- The agent starts from S, it has to reach G.
  Each step costs:
  2 when UP
  1 otherwise.
  Heuristic is based on Manhattan distance.

- In case of same h(s) values, the order of possible actions are:
  RIGHT, DOWN, UP, LEFT

Exercise 5.6

- LRTA*



- The agent starts from S, it has to reach G.
  Each step costs:
  2 when UP
  1 otherwise.
  Heuristic is based on Manhattan distance.

- In case of same h(s) values, the order of possible actions are:
  LEFT, RIGHT, DOWN, UP

Exercise 5.7

- LRTA*

	1	2	3	4	5
1	3	3	2	4	2
2	1	5	8	2	**G**
3	8	8	6	9	6
4	**S (8)**	8	3	6	1
5	3	4	5	3	2

- The agent starts from S, it has to reach G.
  Each step costs:
  2 when UP
  1 otherwise.
  Heuristic is based on Manhattan distance.

- In case of same h(s) values, the order of possible actions are:
  RIGHT, DOWN, UP, LEFT

Exercise 5.8

- LRTA*

	1	2	3	4	5
1	4	3	3	1	6
2	9	6	4	5	6
3	8	4	3	6	**G (0)**
4	3	2	4	7	5
5	7	**S (8)**	8	6	7

- The agent starts from S, it has to reach G.
  Each step costs:
  1 when RIGHT
  2 otherwise.
  Heuristic is given by the numbers included in the maze.

- In case of same **cost** values, the order of possible actions are:
  DOWN, RIGHT, UP, LEFT