

Fundamentals of Artificial Intelligence

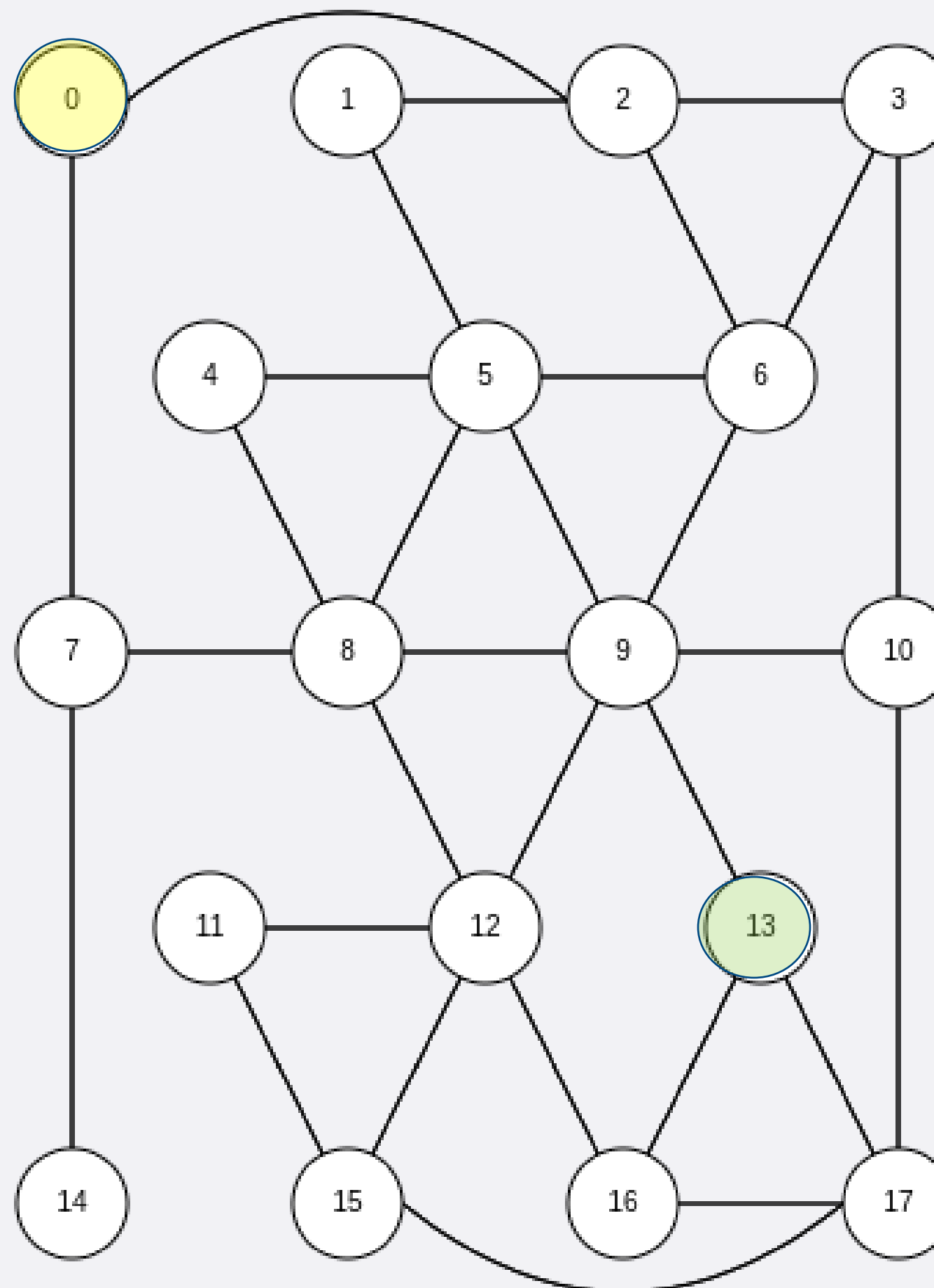
Laboratory

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Academic Year 2020/2021

Exercise 5.1

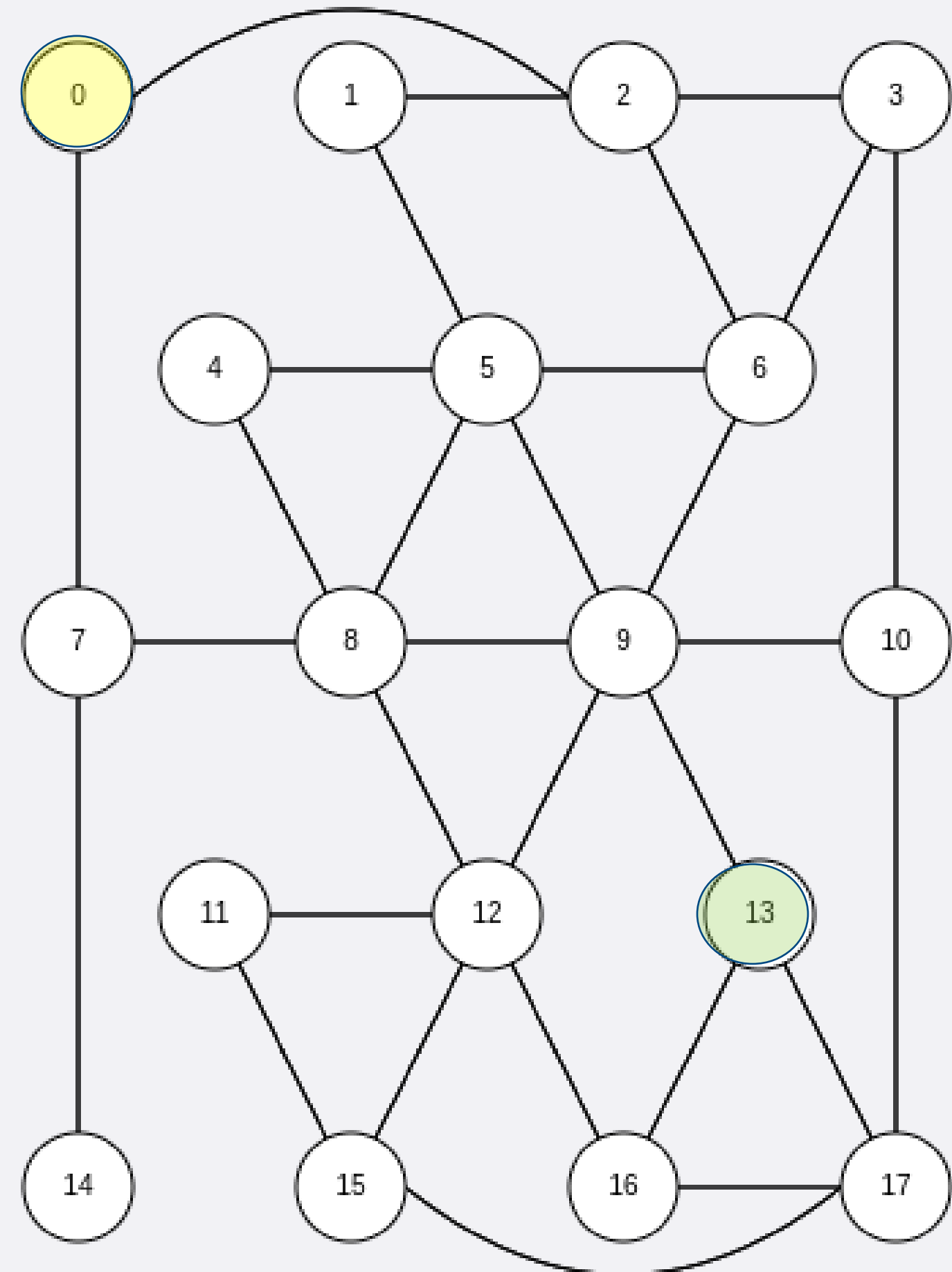
- Apply **online DFS** for reaching the goal (N-13) from the start (N-0). Report the list of **physically visited** nodes. Nodes are visited in descending order.



Exercise 5.1

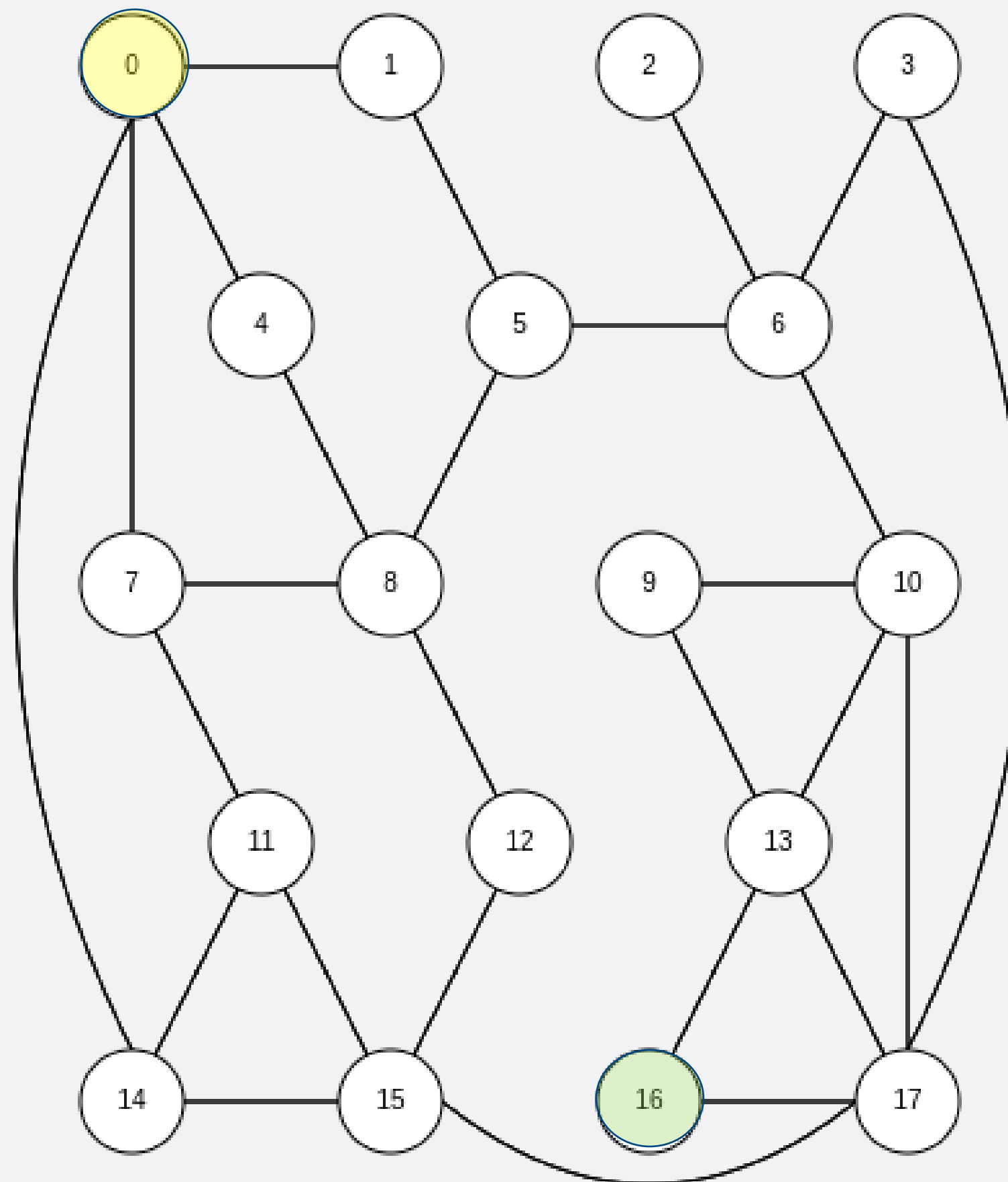
- Apply **online DFS** for reaching the goal (N-13) from the start (N-0). Report the list of **physically visited** nodes. Nodes are visited in descending order.

- List of visited nodes:
0, 7, 14, 7, 8, 12, 16, 17, 15, 11, 15, 17, 13



Exercise 5.2

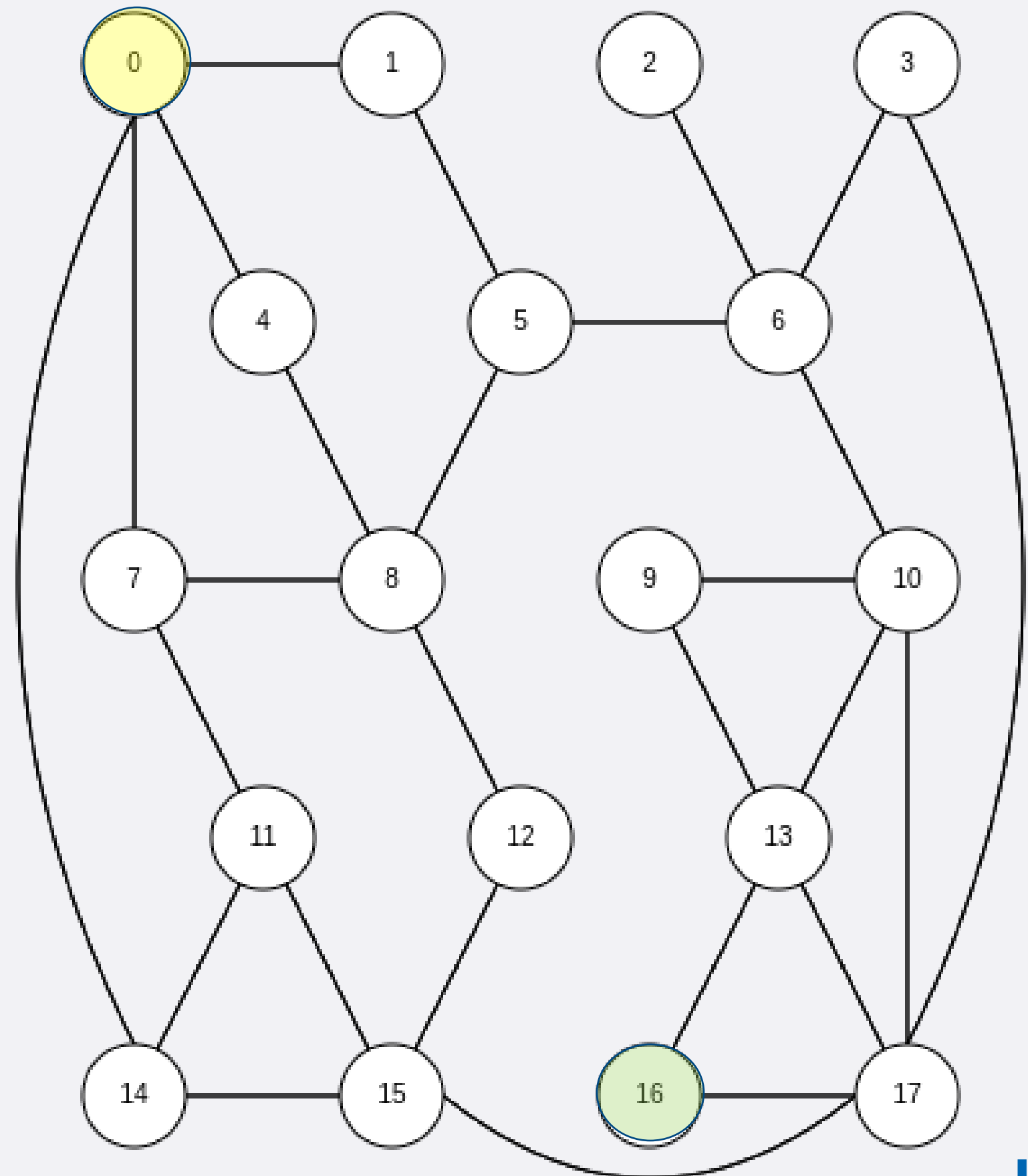
- Apply **online DFS** for reaching the goal (N-16) from the start (N-0). Report the list of **physically visited** nodes. Nodes are visited in ascending order.



Exercise 5.2

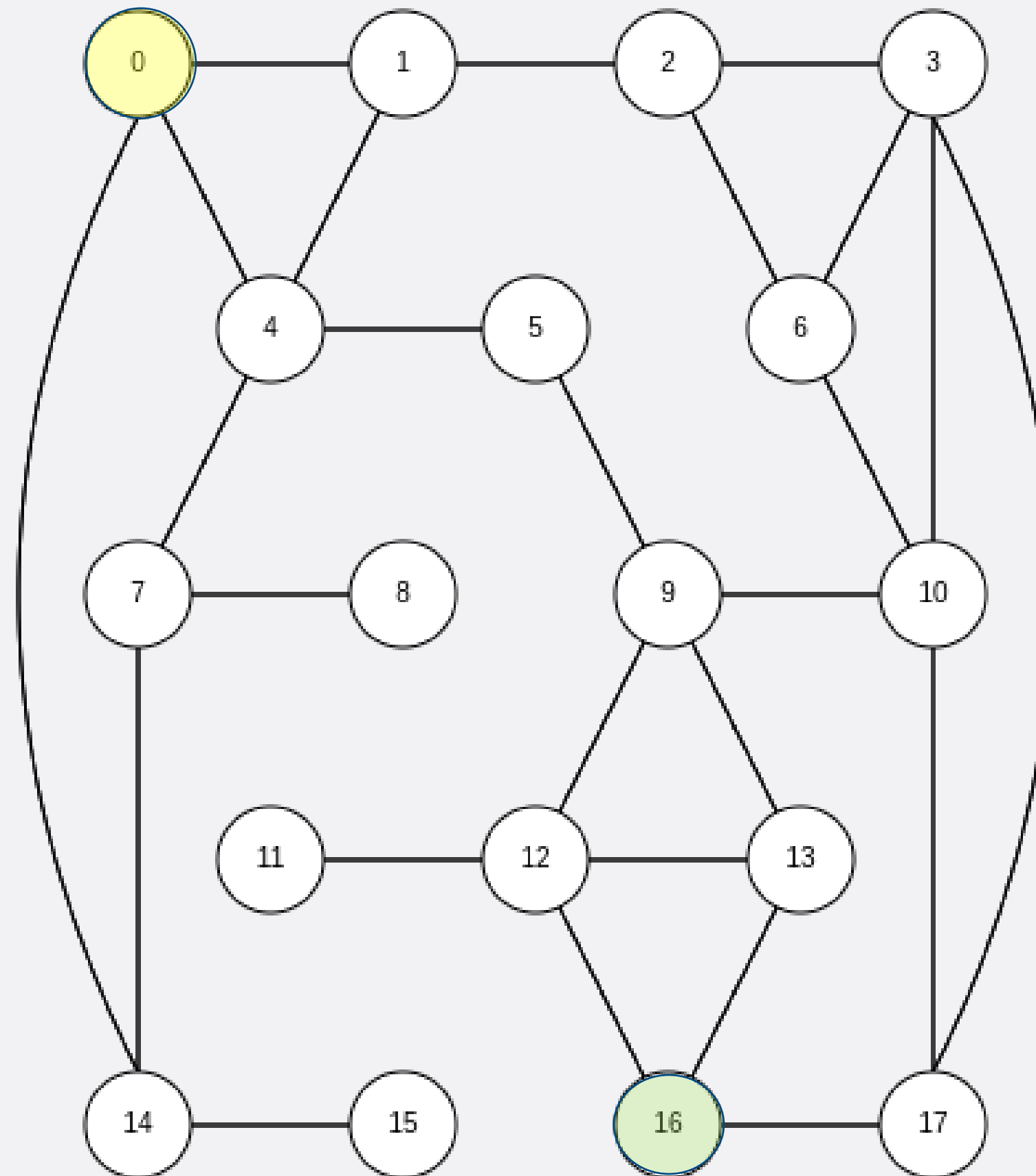
- Apply **online DFS** for reaching the goal (N-16) from the start (N-0). Report the list of **physically visited** nodes. Nodes are visited in ascending order.

- List of visited nodes:
0, 1, 5, 6, 2, 6, 3, 17, 10, 9, 13, 16



Exercise 5.6

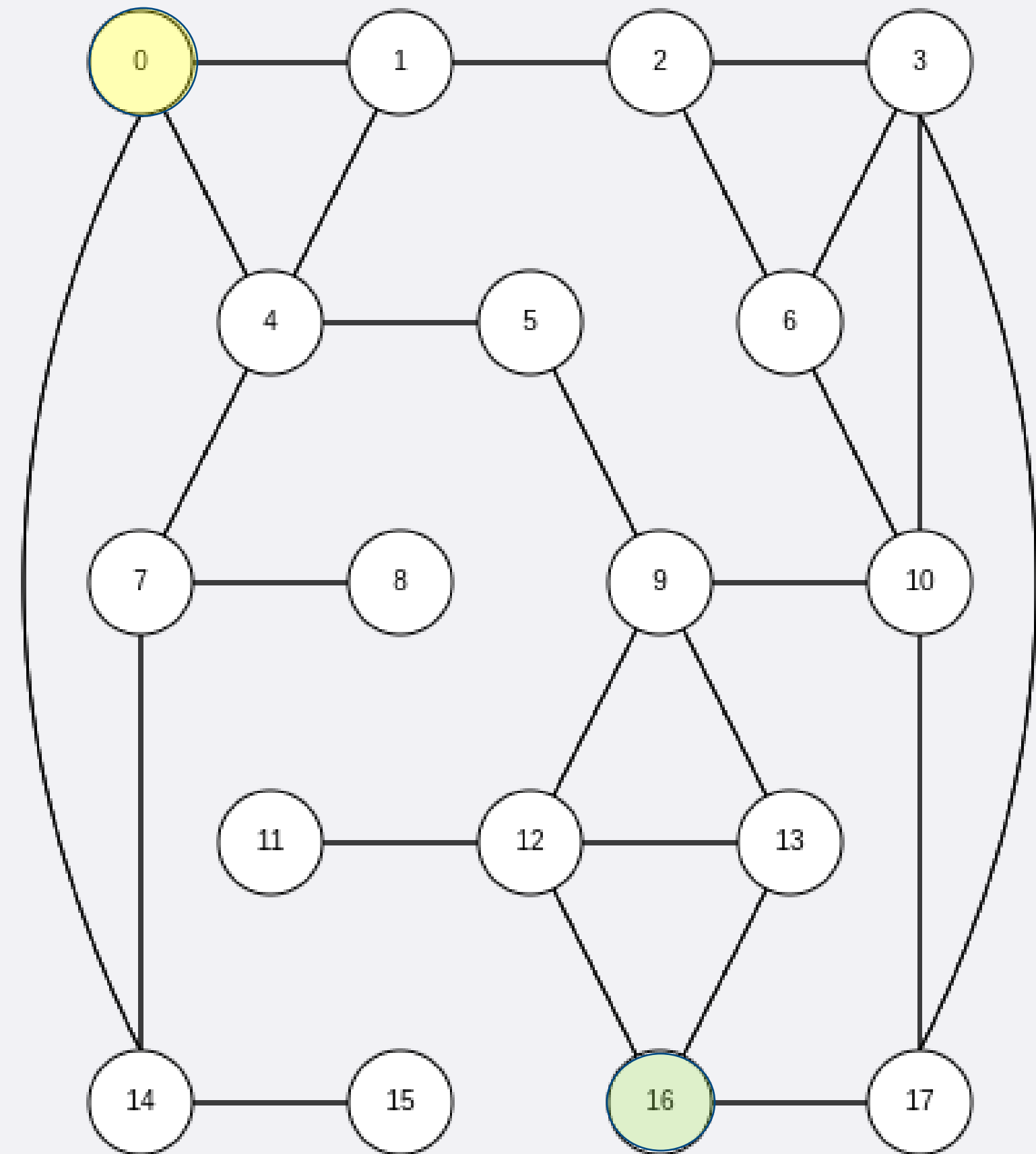
- Apply **online DFS** for reaching the goal (N-16) from the start (N-0). Report the list of **physically visited** nodes. Nodes are visited in descending order.



Exercise 5.6

- Apply **online DFS** for reaching the goal (N-16) from the start (N-0). Report the list of **physically visited** nodes. Nodes are visited in descending order.

- List of visited nodes:
0, 14, 15, 14, 7, 8, 7, 4, 5, 9, 13, 16



Exercise 5.3

- LRTA*

	1	2	3	4
1			G	
2				
3				
4	S			

- 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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

- LRTA*

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

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

Exercise 5.3

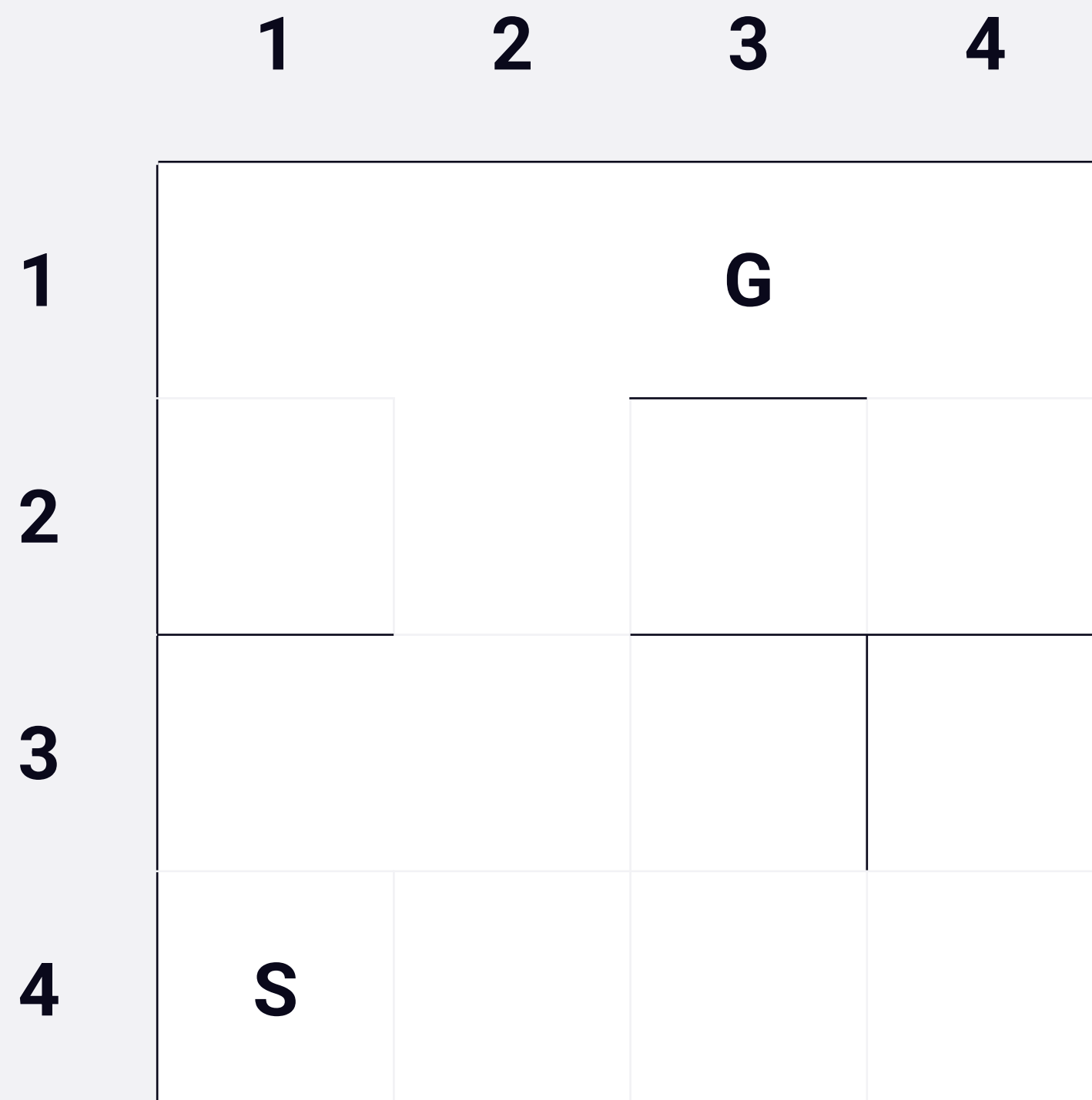
- LRTA*

	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*

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

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

Exercise 5.4

- LRTA*

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

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

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*

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

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

Exercise 5.4

- LRTA*

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

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

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

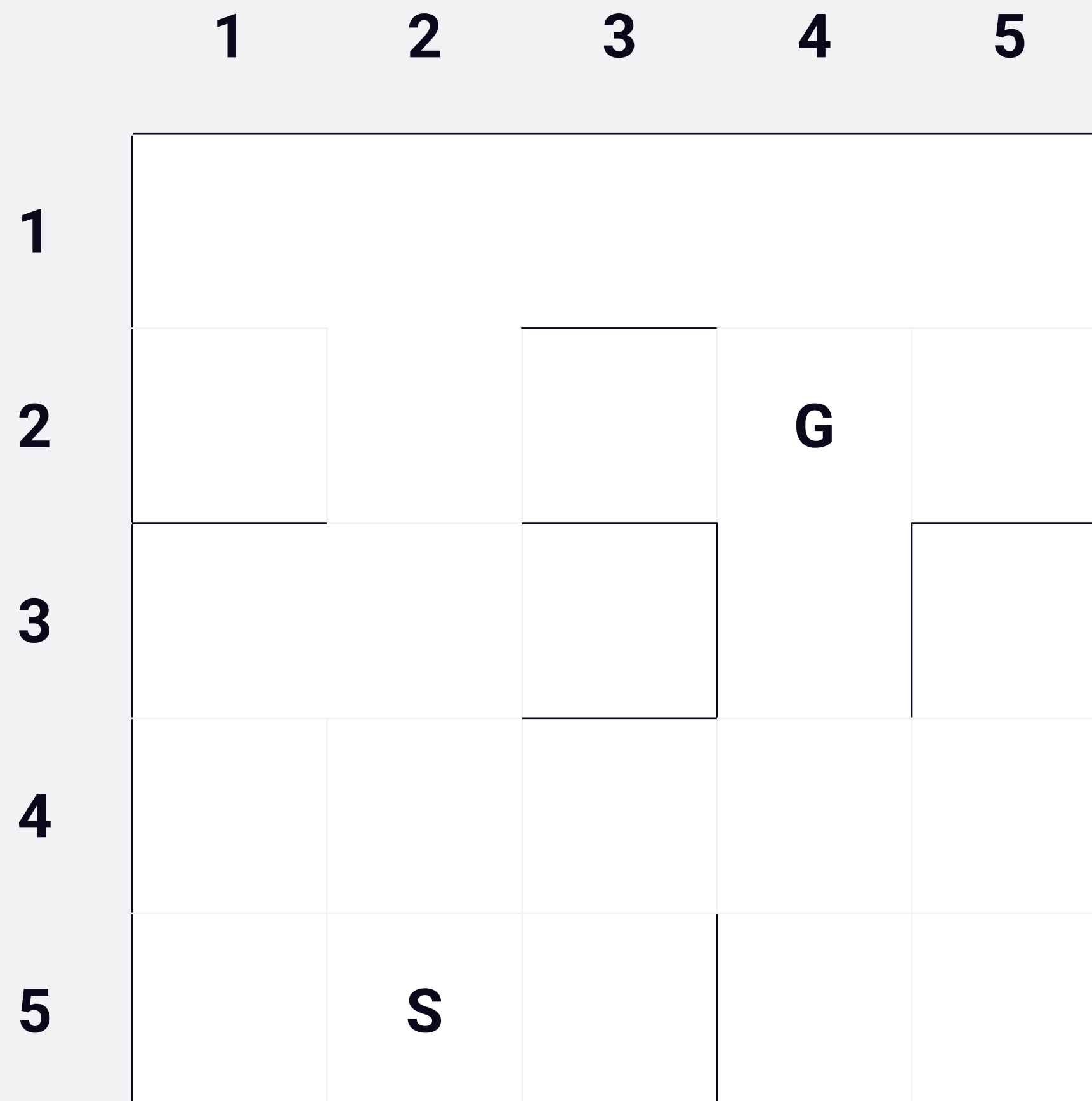
- LRTA*

	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