Single Linked List

“Pieces of Dynamic Memory stitched using pointer”

Prerequisite: Pointer, Structure

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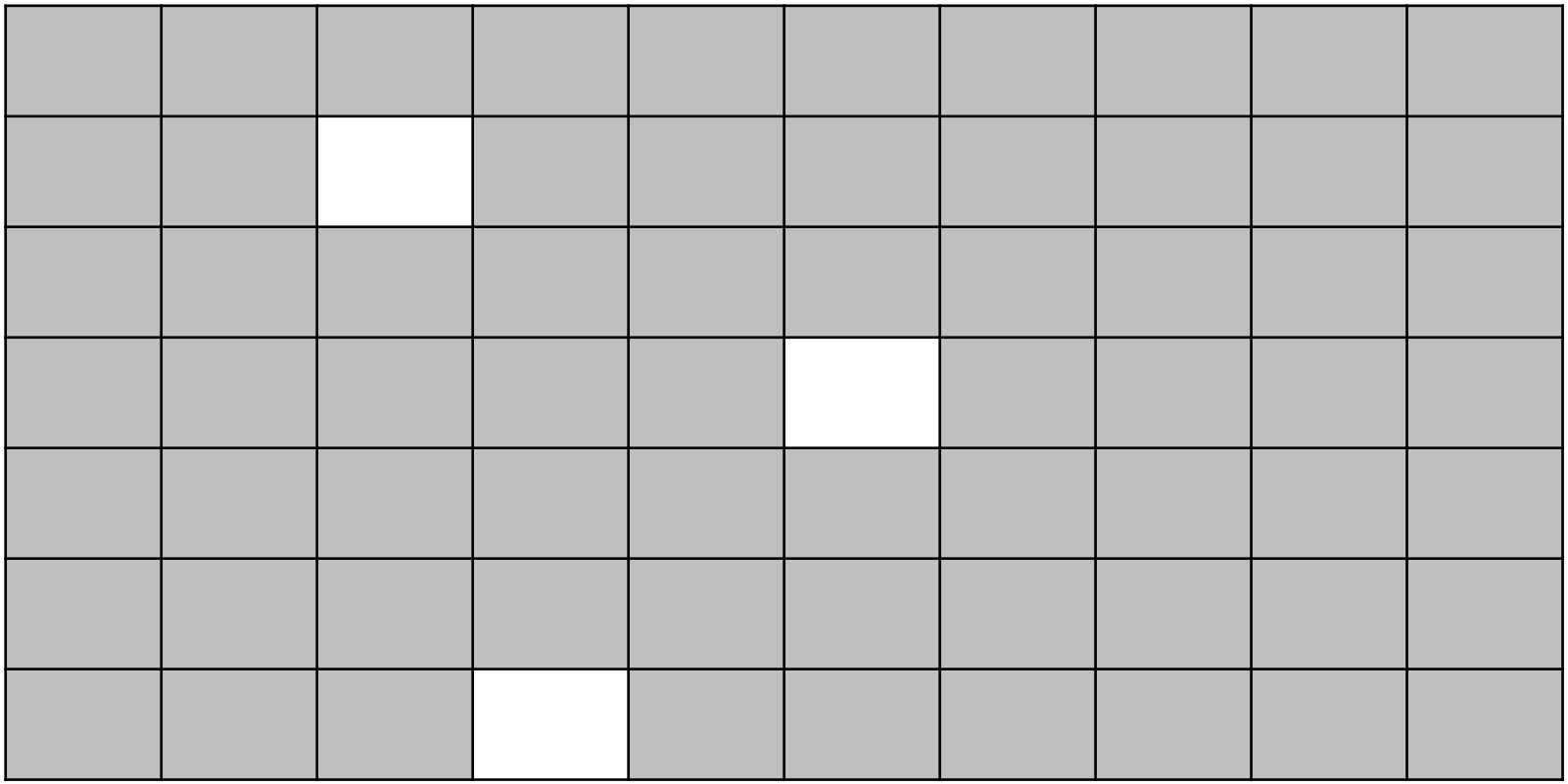
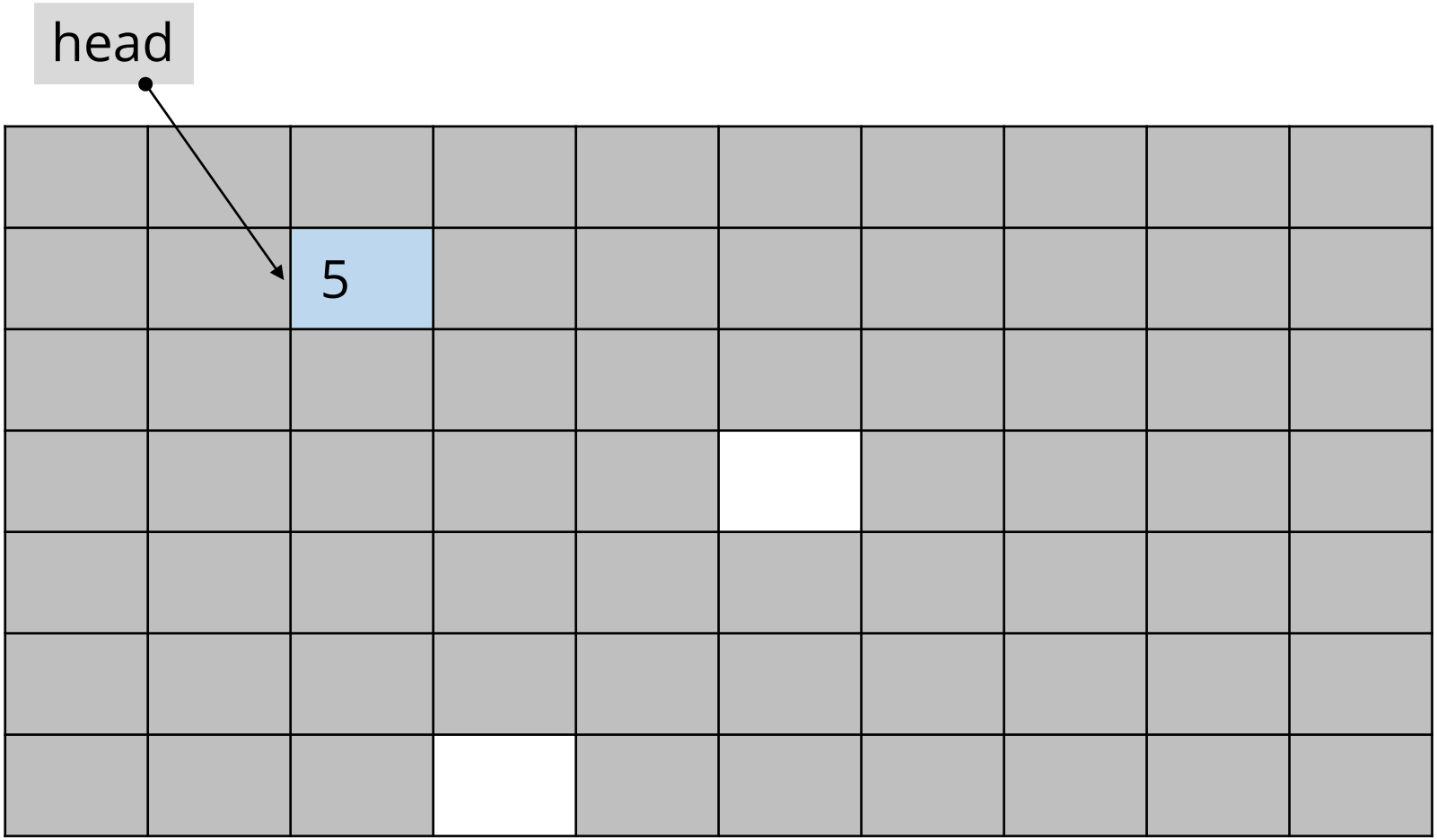
RAM

What If continuous memory is not available?



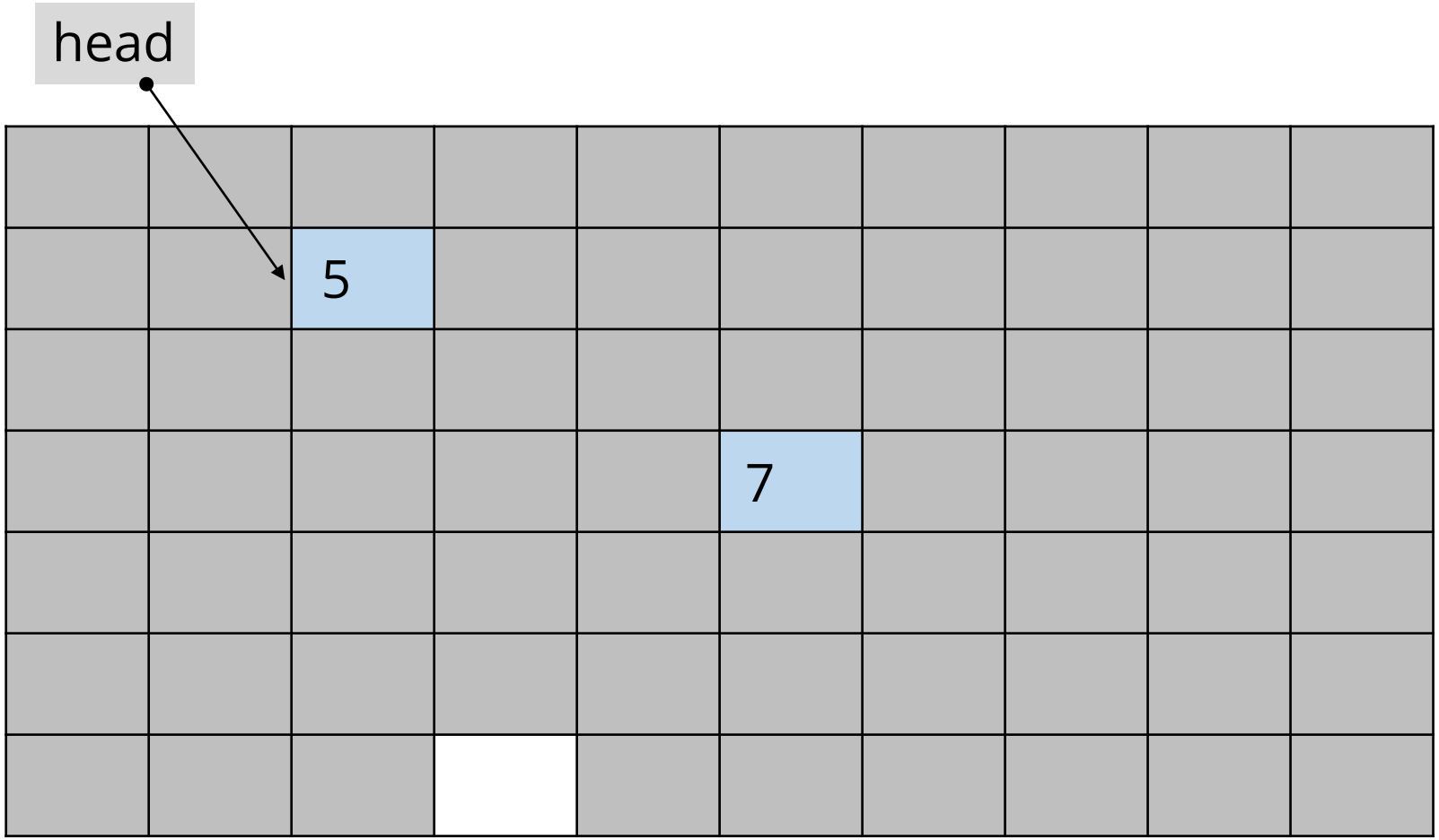
Linked List

What If continuous memory is not available?

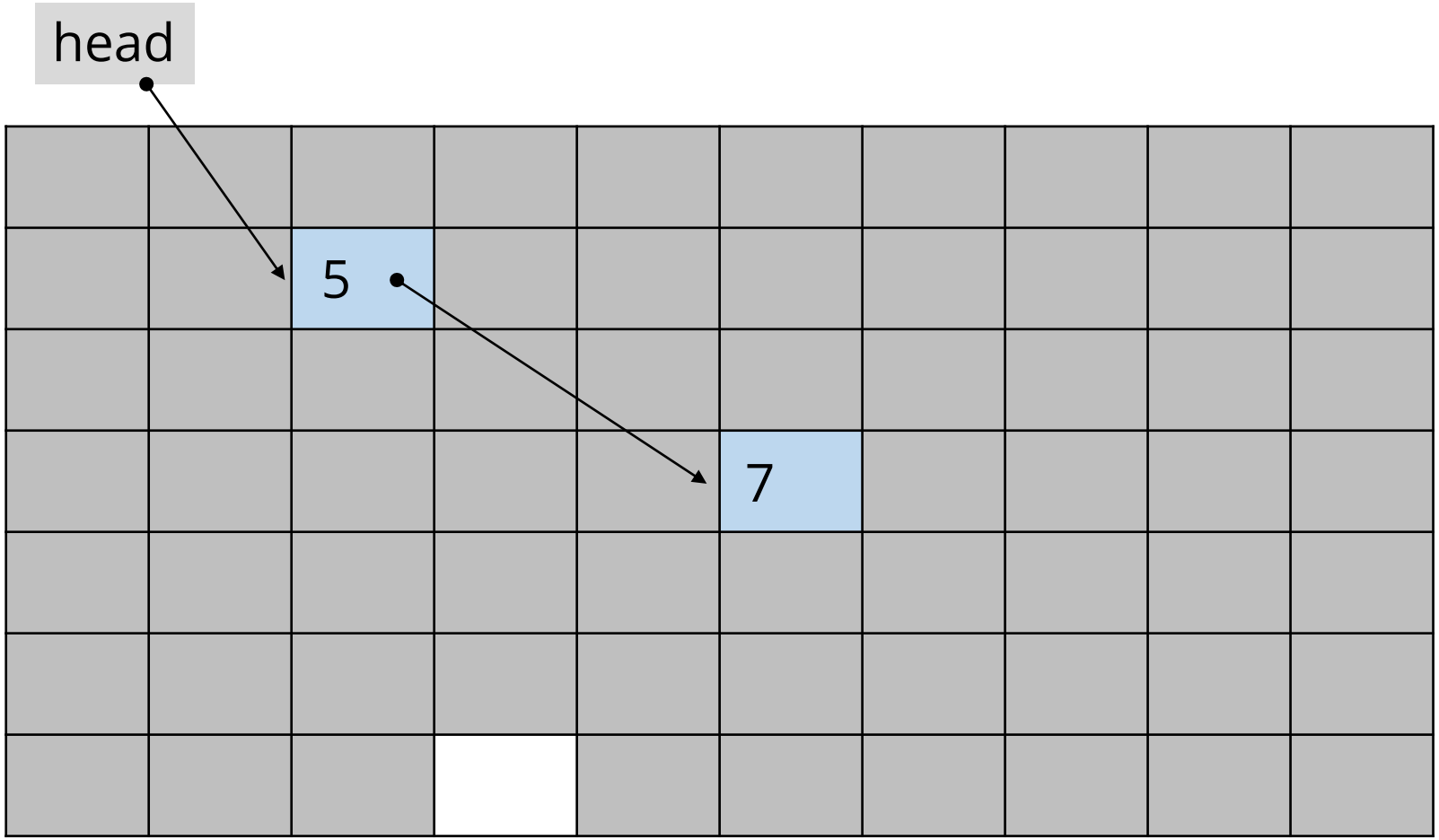


Linked List

What If continuous memory is not available?

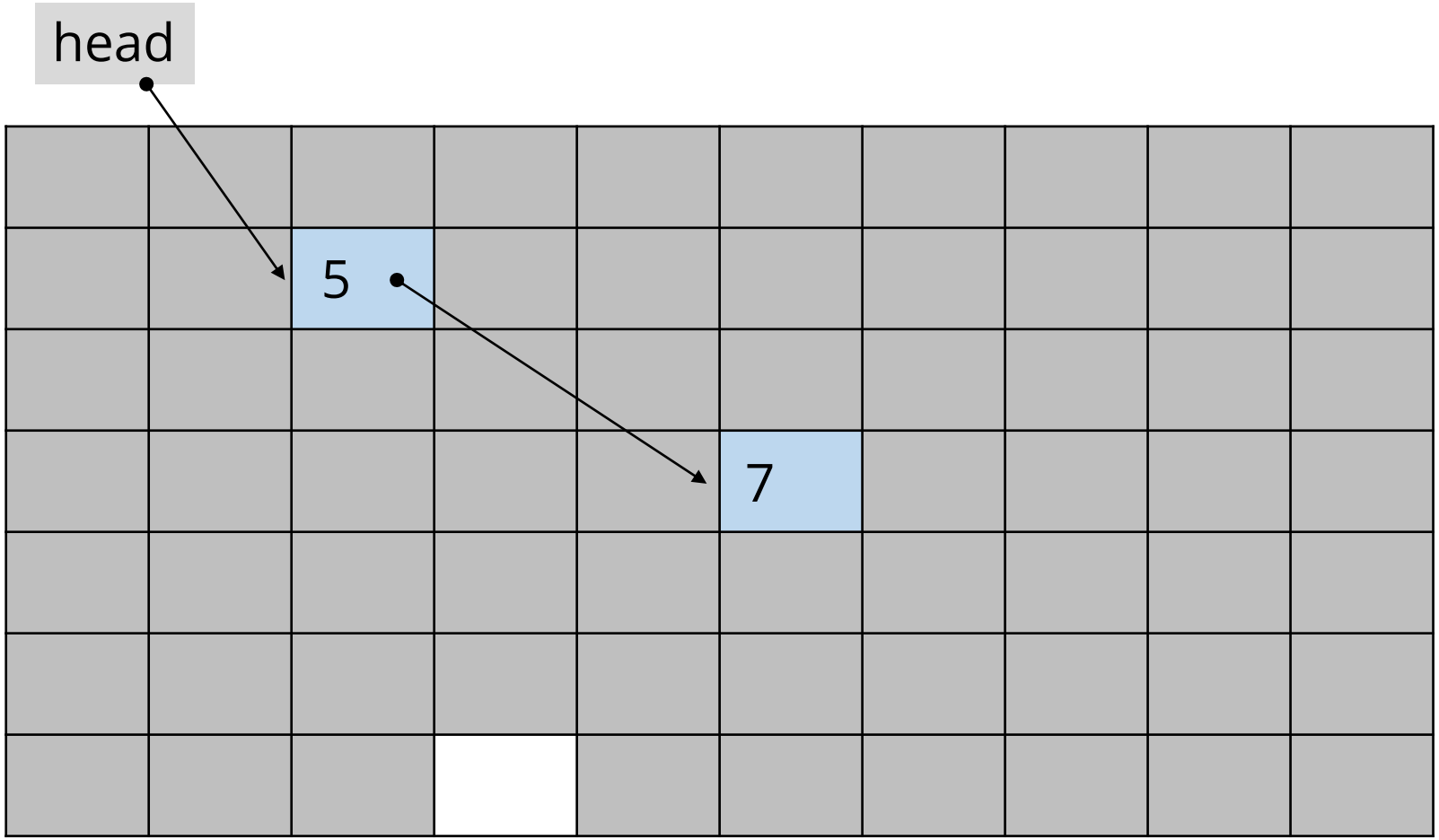


Linked List



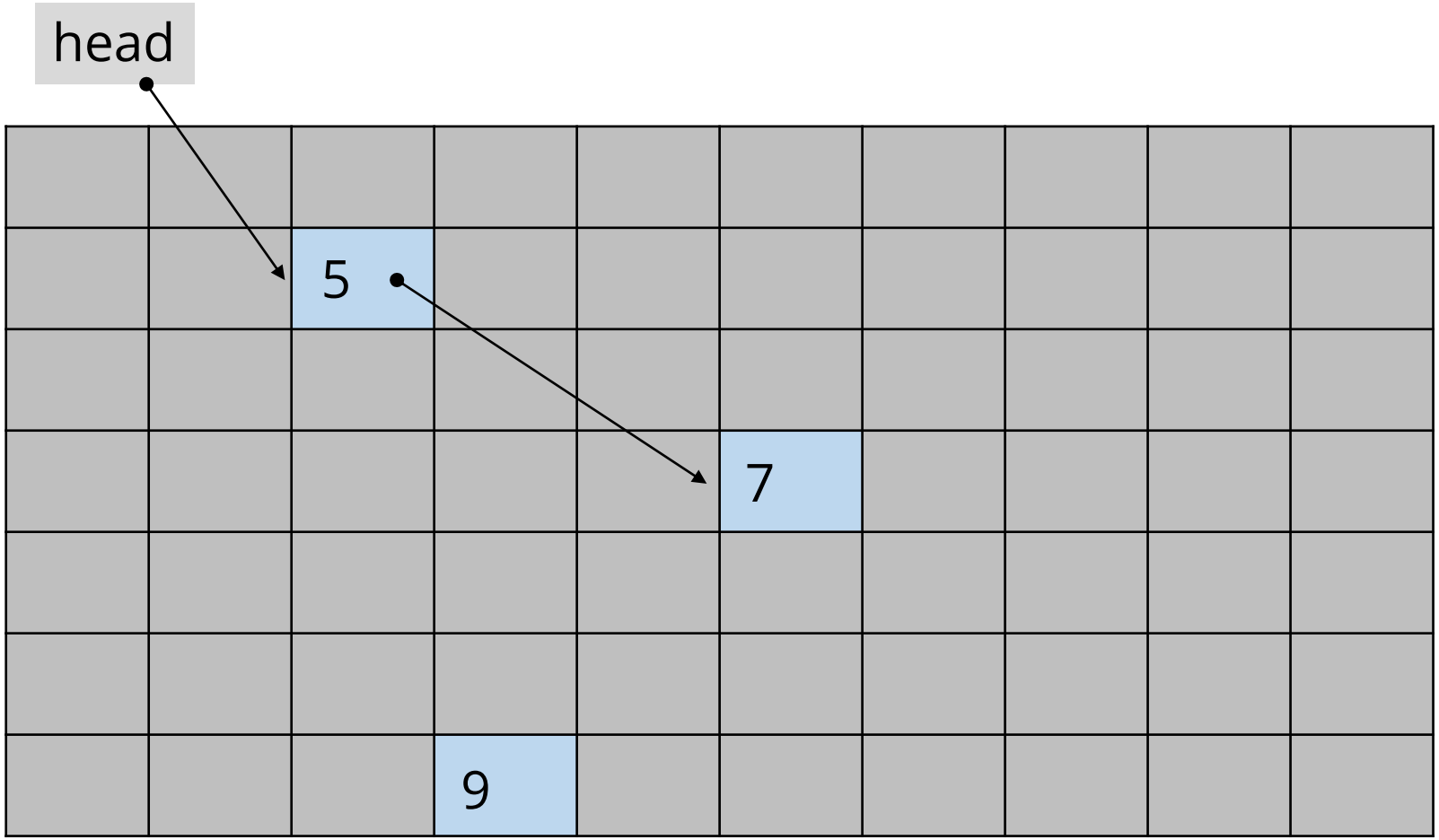
Linked List

Push_front 9 ?



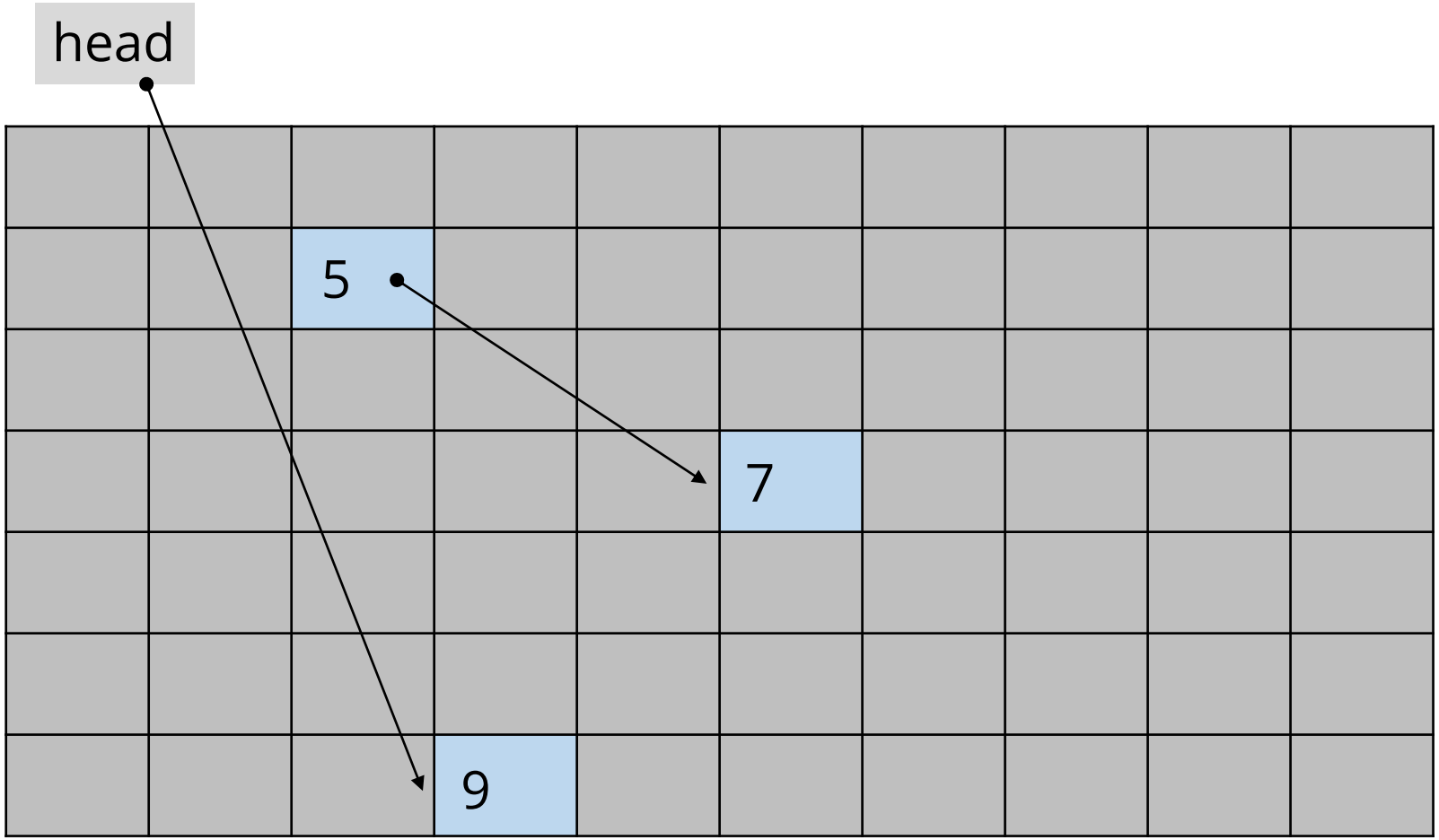
Linked List

Push_front 9 ?



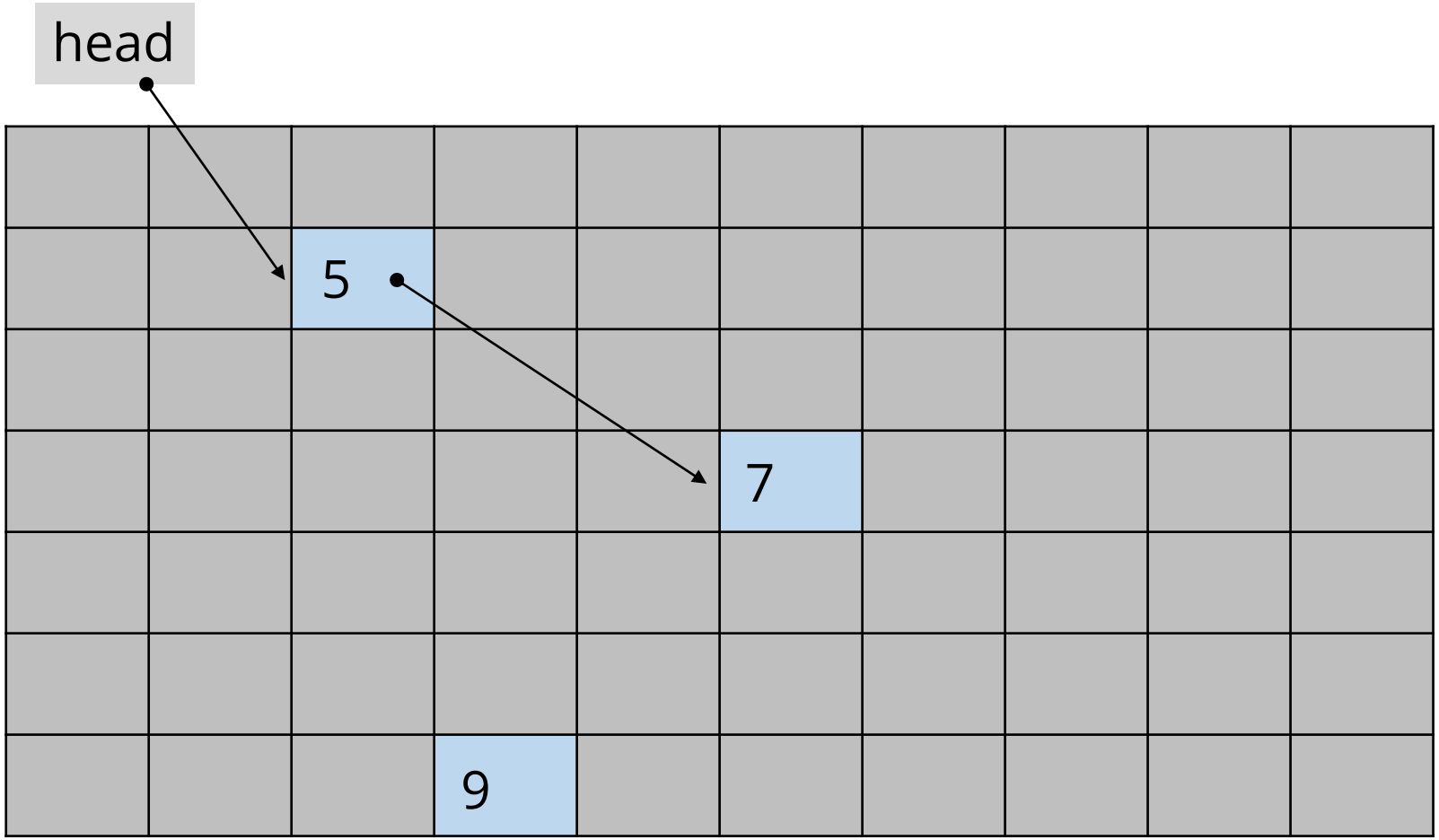
Linked List

Should we now move the head?



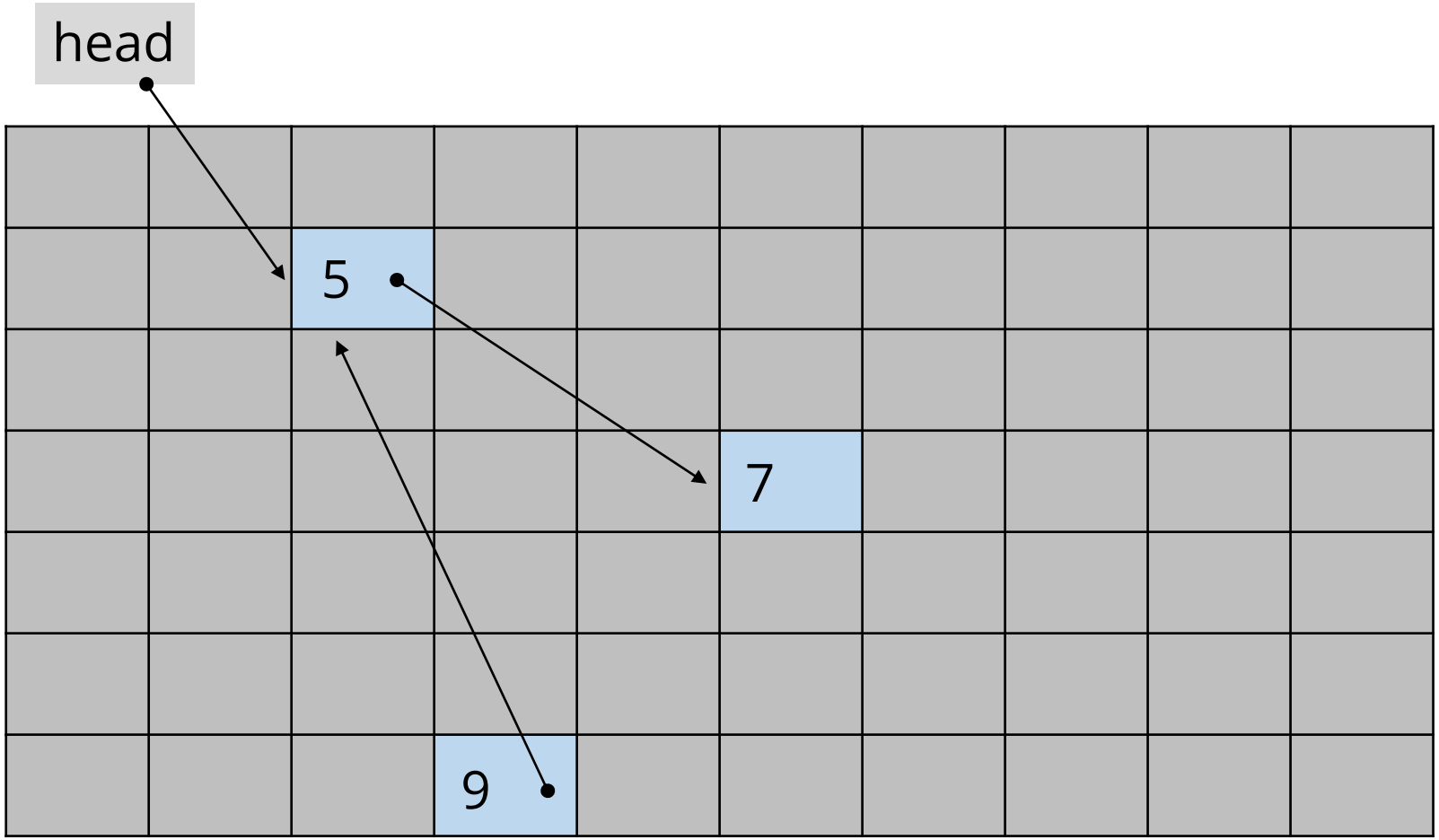
Linked List

Push_front 9 ?



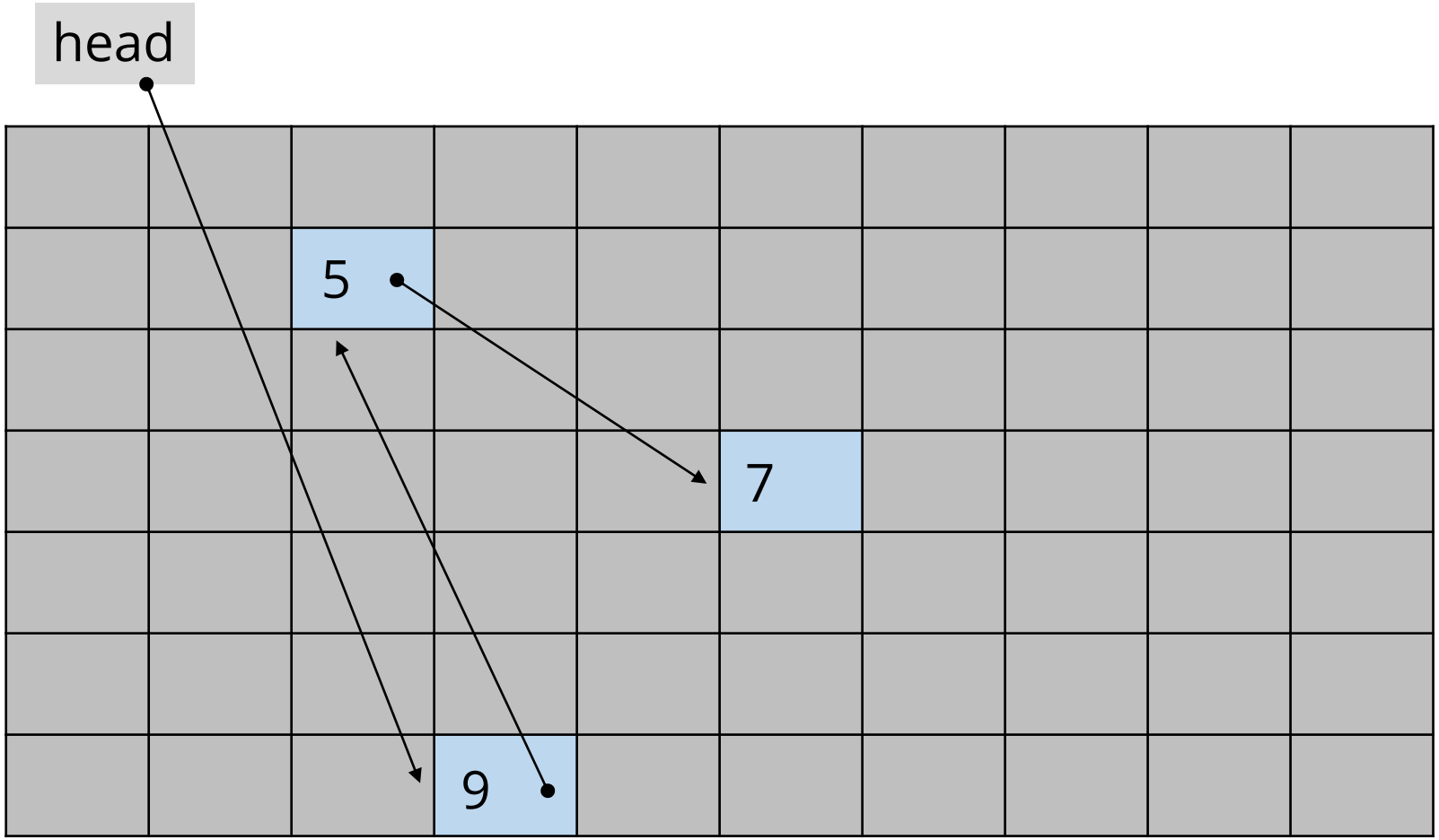
Linked List

Push_front 9 ?



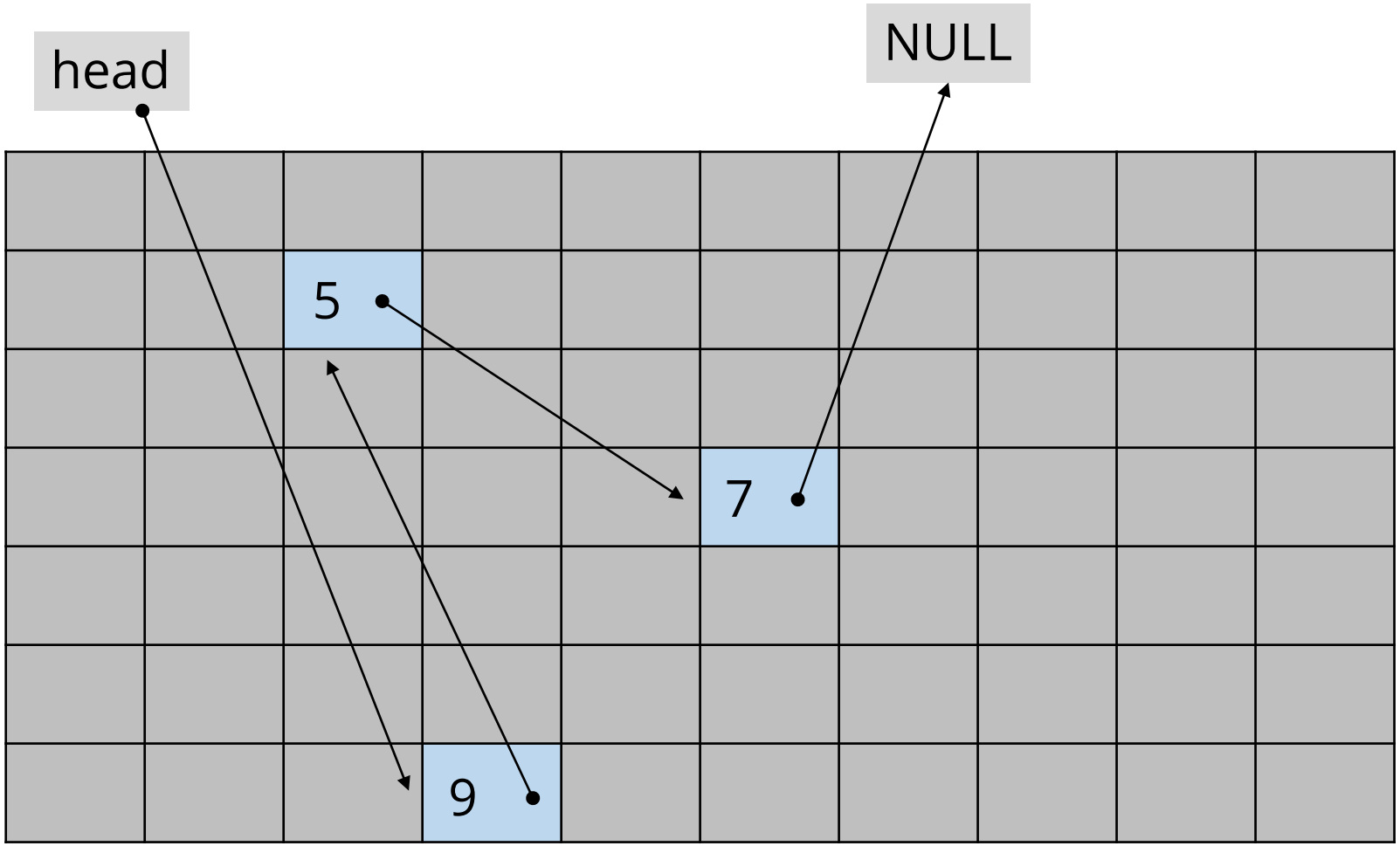
Linked List

Push_front 9 ?



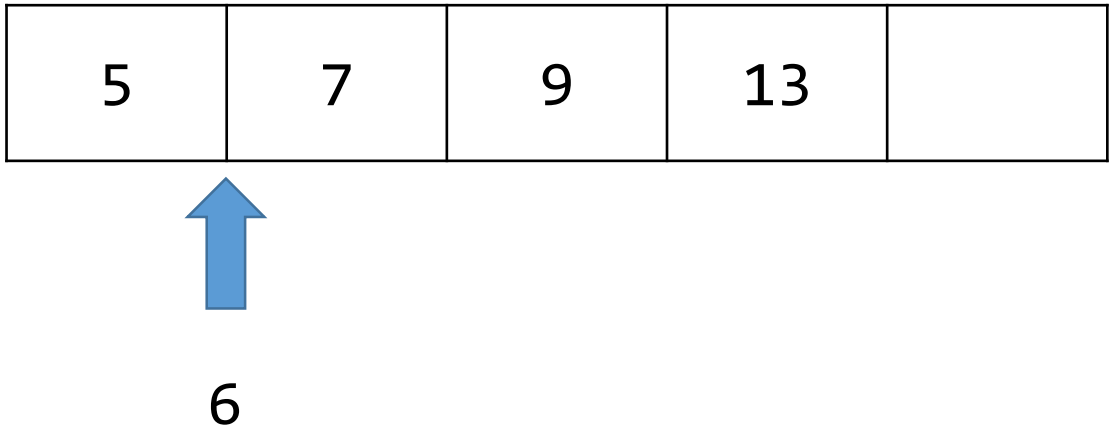
Linked List

Denote end with NULL



Insertion/Deletion in Array

Requires adjustment



Insertion/Deletion in Array

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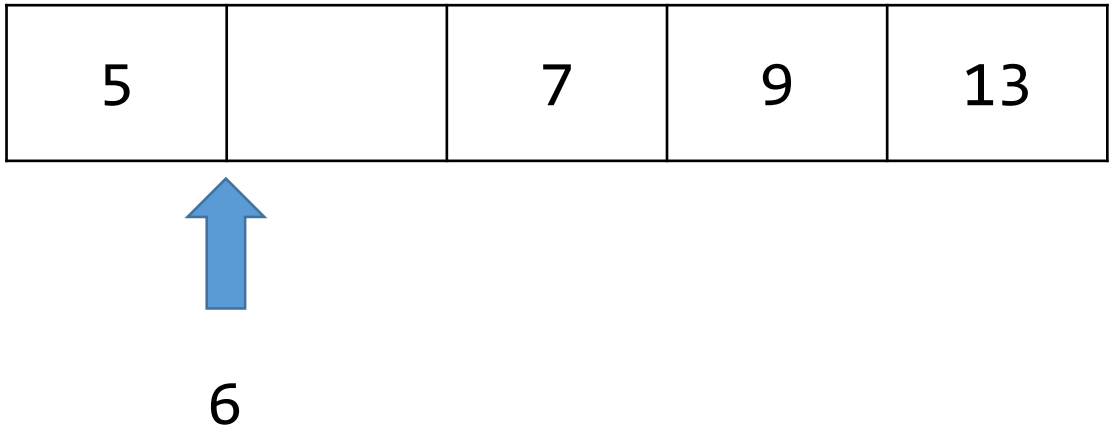
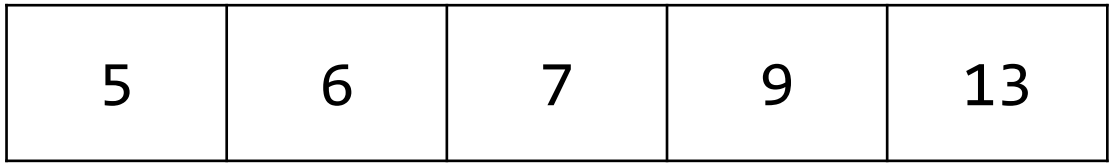


Insertion/Deletion in Array

Requires adjustment



Comparison with Array

Worst Case Complexity

Operation	Array	Linked List
Access		
Search		
Insertion		
Deletion		

Comparison with Array

Worst Case Complexity

Operation	Array	Linked List
Access	O(1)	
Search	O(n)	
Insertion	O(n)	
Deletion	O(n)	

Comparison with Array

Worst Case Complexity

Operation	Array	Linked List
Access	O(1)	O(n)
Search	O(n)	O(n)
Insertion	O(n)	O(1)
Deletion	O(n)	O(1)

Standard Operations of Linked List

1. Insertion − Adds an element at the beginning of the list.
2. Deletion − Deletes an element at the beginning of the list.
3. Display − Displays the complete list.
4. Search − Searches an element using the **given key**.
5. Delete − Deletes an element using the **given key**.

Source: https://www.tutorialspoint.com/data_structures_algorithms/linked_list_algorithms.htm