Linked Lists

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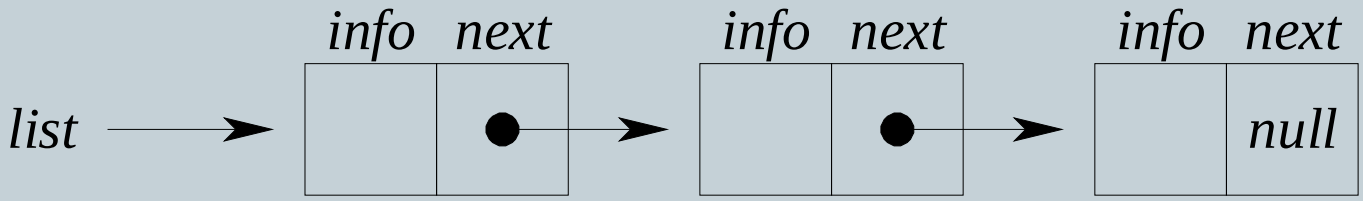
- A ***linked list*** is a linear collection of data elements, called ***nodes***, where the linear order is given by means of ***pointers***.
- Each **node** is divided into two parts:
  - The first part contains the ***information*** of the element and
  - The second part contains the address of the next node (***link /next pointer field***) in the list.

Linked Lists



Linear linked list

- LinkedList<T> sentence = new LinkedList<T>();

```
1  // Create the link list.
2  string[] words ={ "the", "fox", "jumps", "over", "the", "dog" };
3  LinkedList<string> sentence = new LinkedList<string>(words);
```

Adding an Element to the last of a Linked List


```
1  // Creating a LinkedList of Strings
2  LinkedList<int> myList = new LinkedList<int>();
3  // Adding nodes in LinkedList
4  myList.AddLast(5);
5  myList.AddLast(3);
6  myList.AddLast(8);
```

Some Notations for use in algorithm (Not in C programs)

- **AddAfter(current, "old")**

Adds a new node or value after an existing node in the LinkedList.

- **AddBefore(current, "quick")**

Adds a new node or value before an existing node in the LinkedList.

- **AddFirst("today")**

Adds a new node or value at the start of the LinkedList.

- **AddLast("yesterday")**

Adds a new node or value at the end of the LinkedList**.**

- **Remove(LinkedListNode)**

Removes the specified node from the LinkedList.

- **Remove("old")**

Removes the first occurrence of the specified value from the LinkedList.

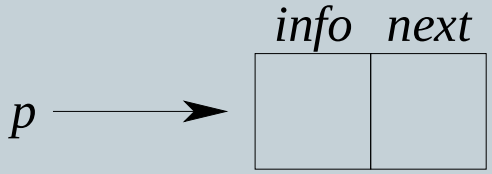
- **RemoveFirst()**

Removes the node at the start of the LinkedList.

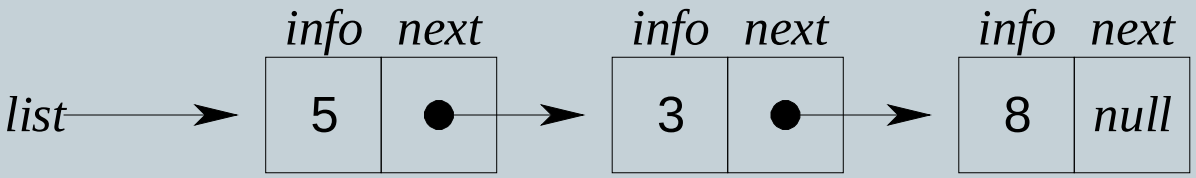
- **RemoveLast()**

Removes the node at the end of the LinkedList.

Adding an Element to the front of a Linked List



p = getnode()



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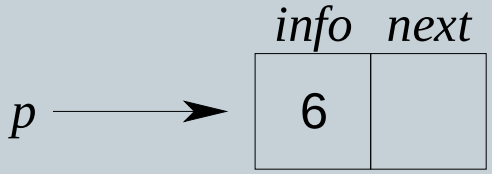
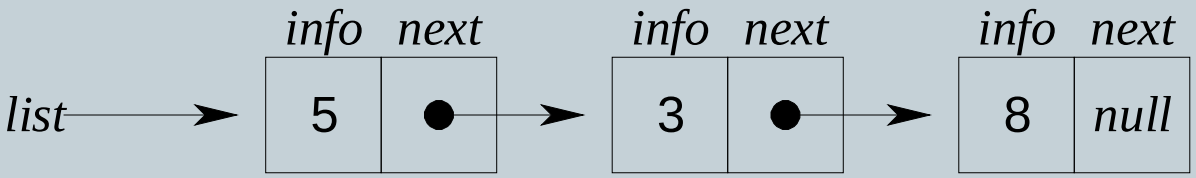


info(p) = 6



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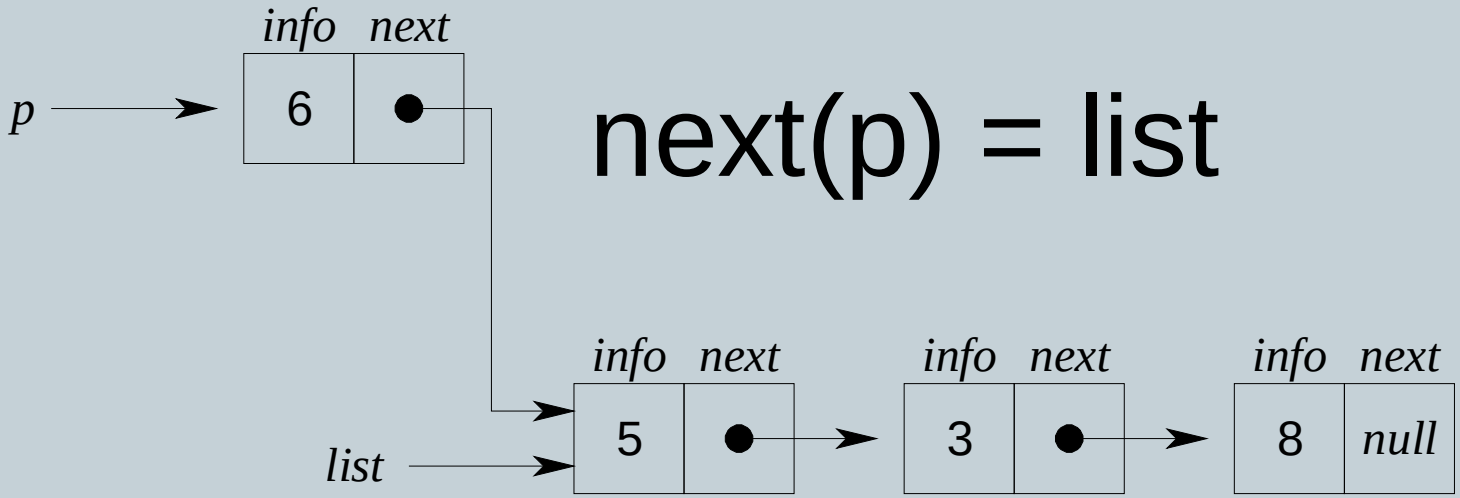

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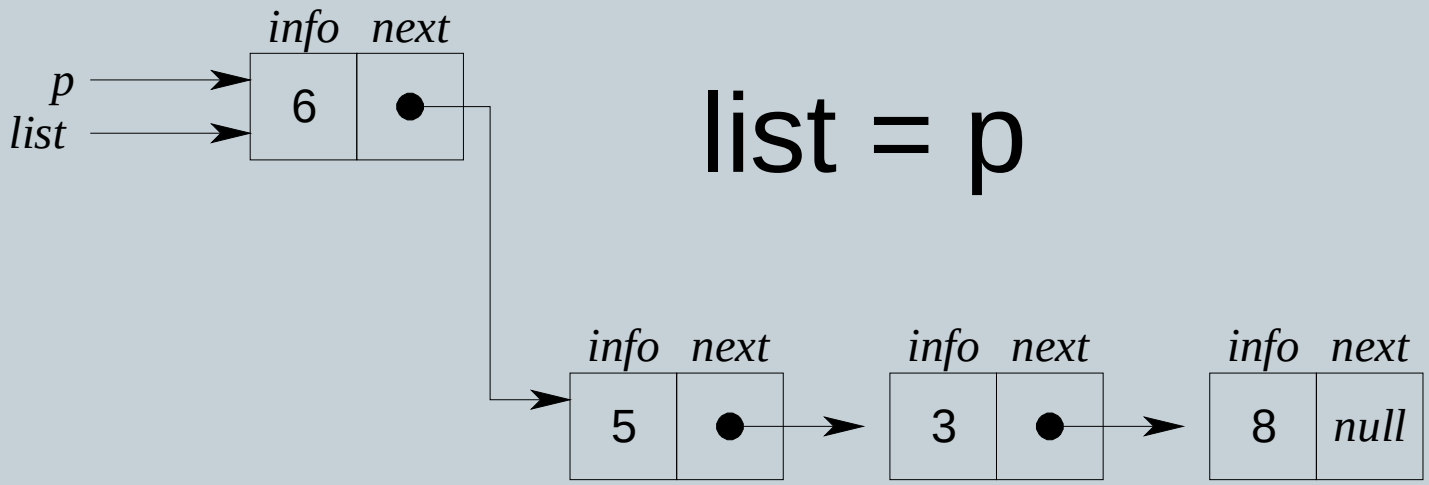

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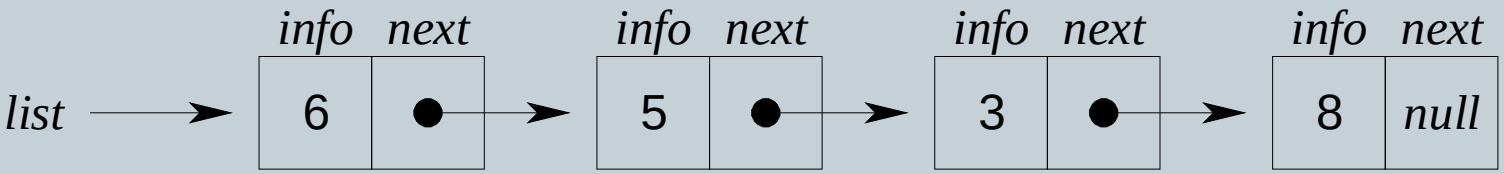
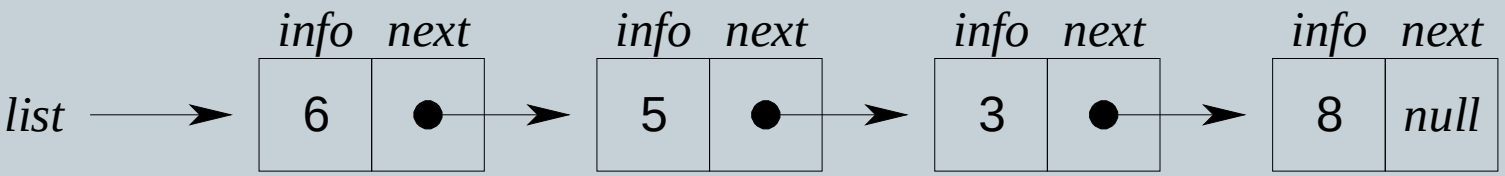
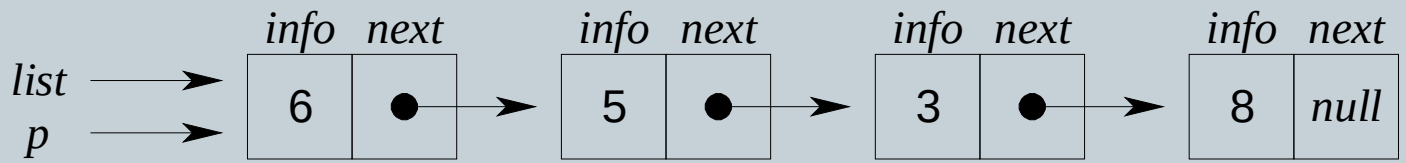


Removing an Element from the front of a Linked List



Removing an Element from the front of a Linked List

p = list



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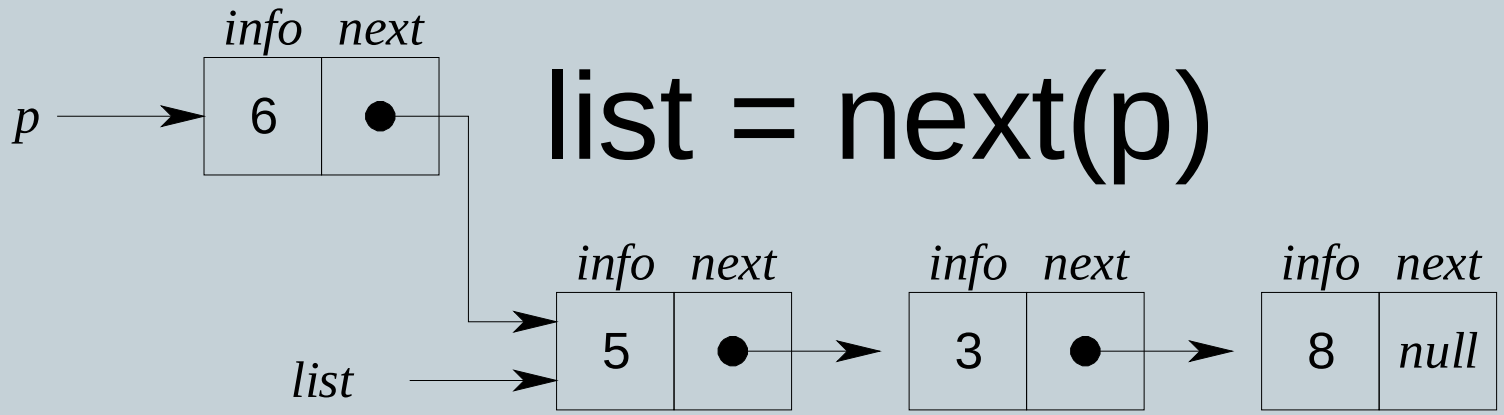

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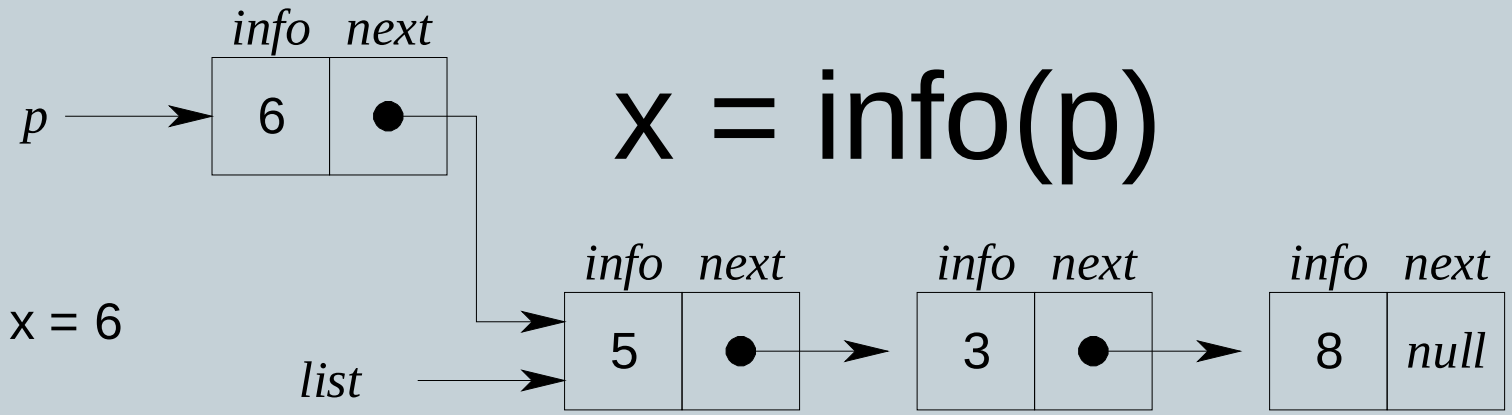

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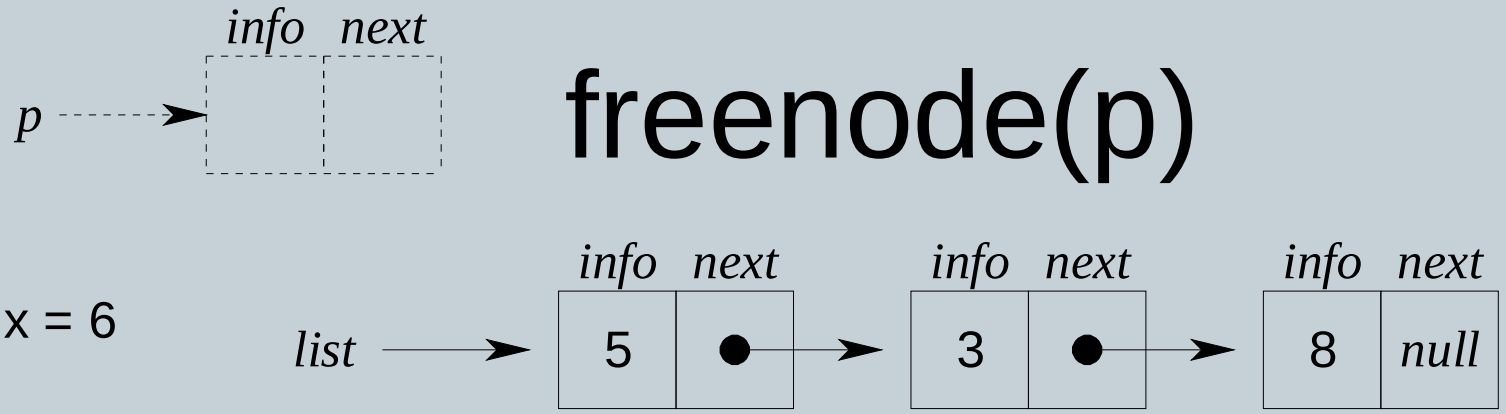

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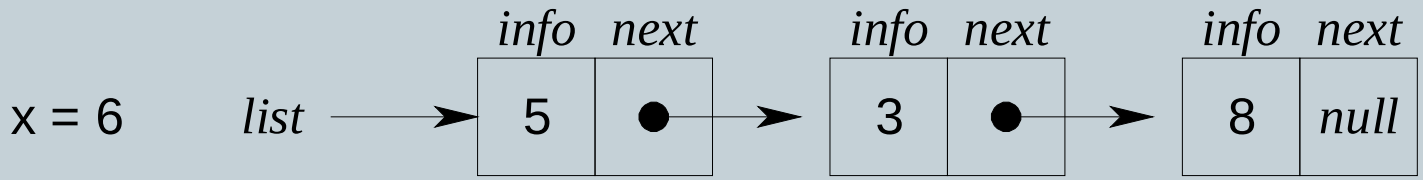
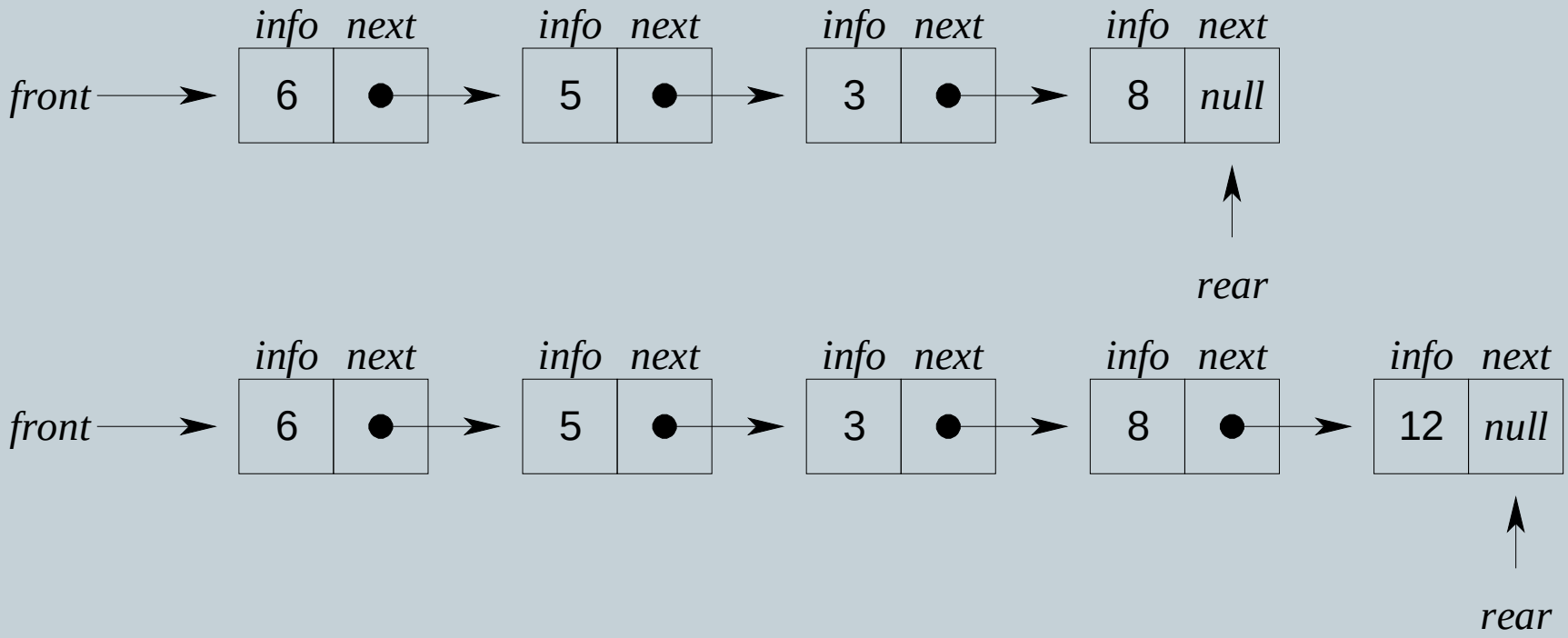
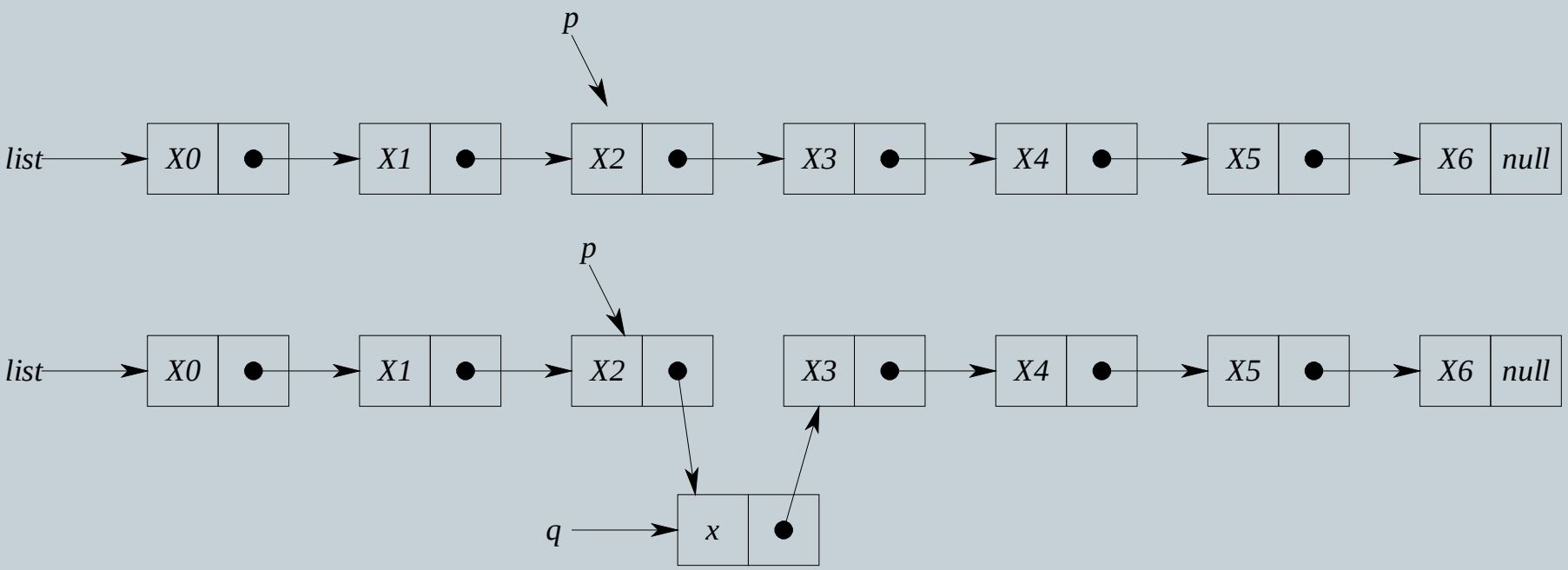


Linked List Implemantation of QUEUES



Inserting an item *x* into a list after a node pointed to by *p*



Deleting an item *x* from a list after a node pointed to by *p*