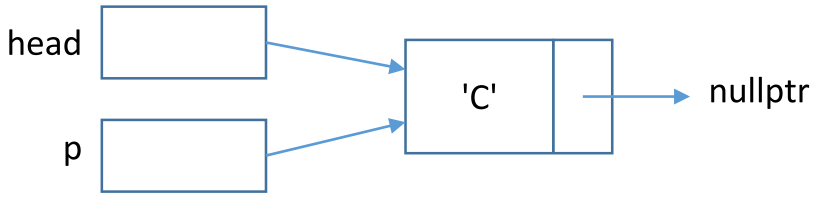
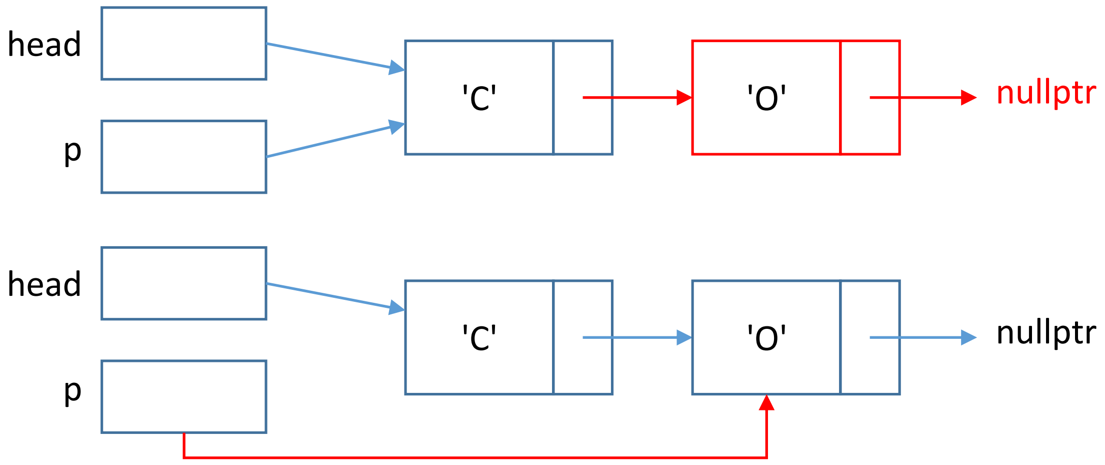
Topic 9: Linked List --- Demonstrating what ll_create does

Suppose we pass "COMP" to ll_create

Step 1

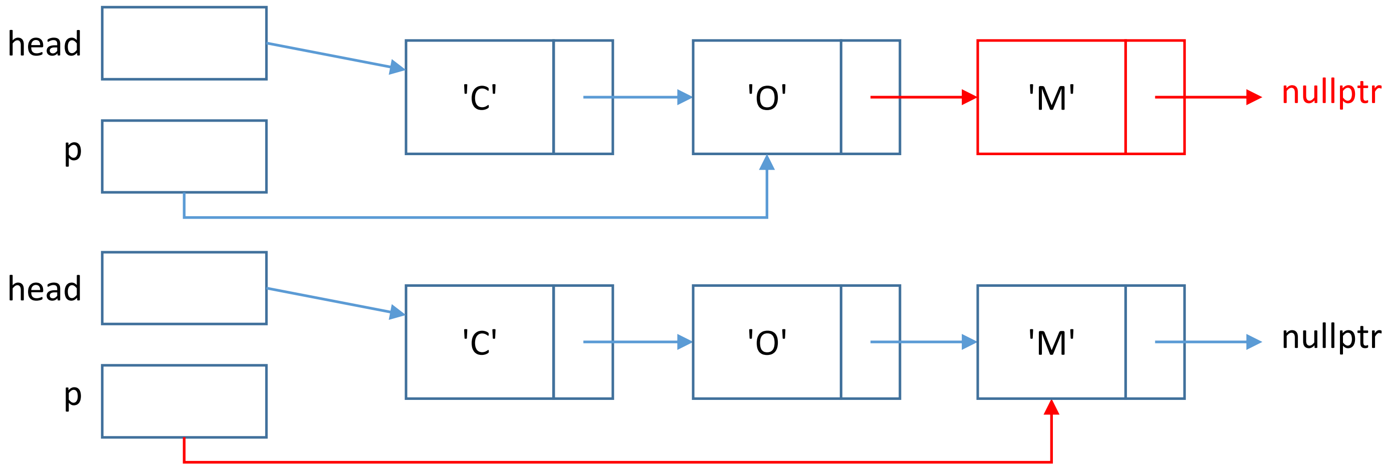


Step 2

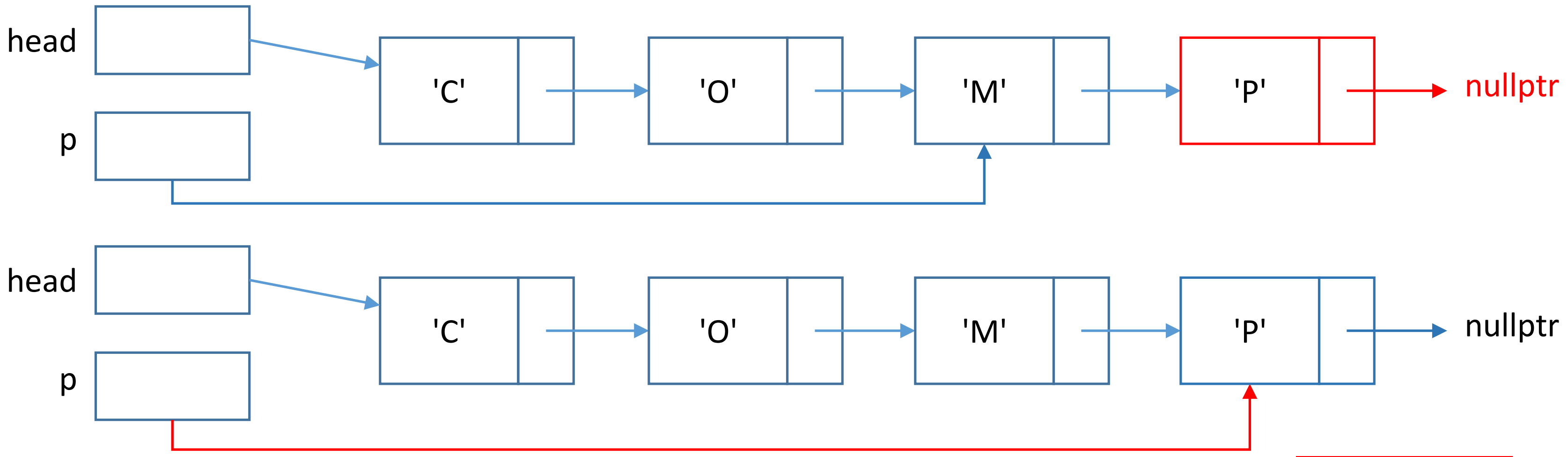


Topic 9: Linked List --- Demonstrating what ll_create does

Step 3



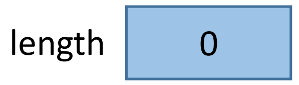
Step 4



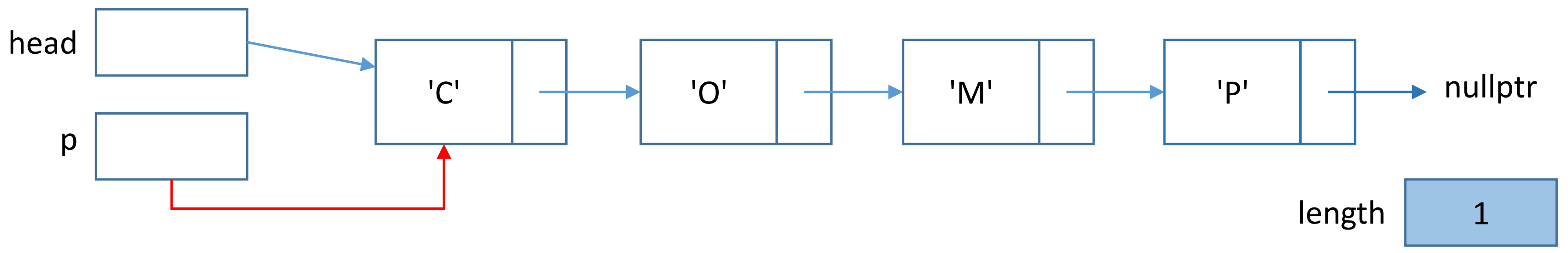
return head;

Topic 9: Linked List --- Demonstrating what ll_length does

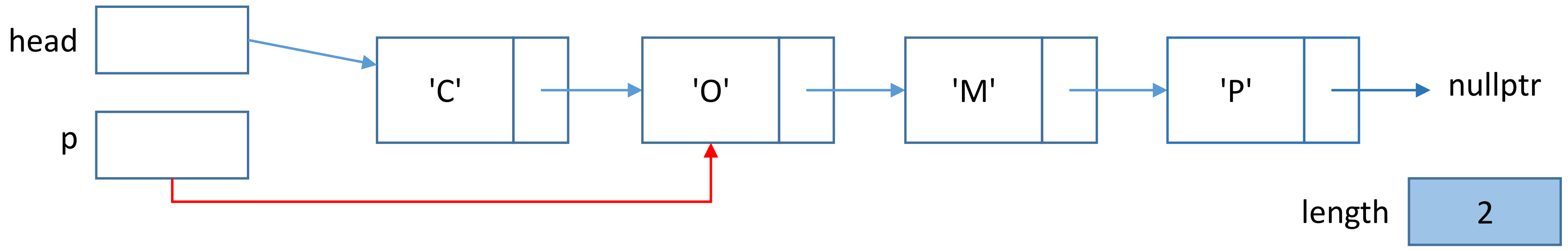
Suppose we pass head pointer to ll_length



Step 1

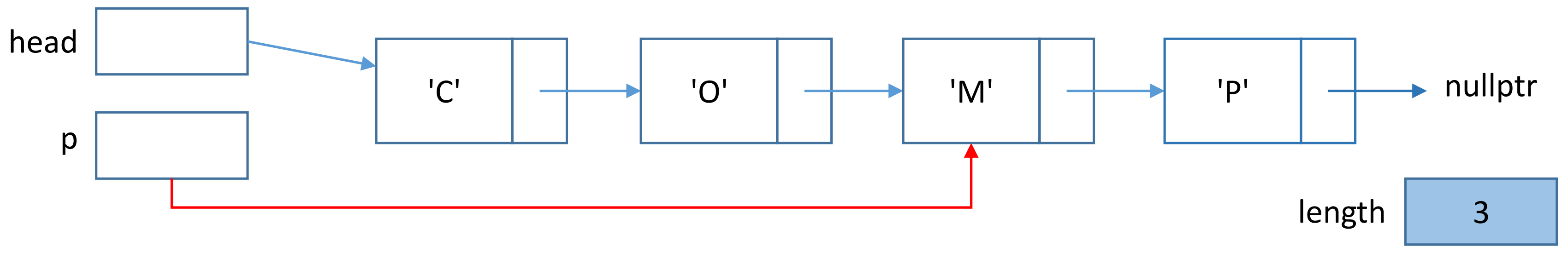


Step 2

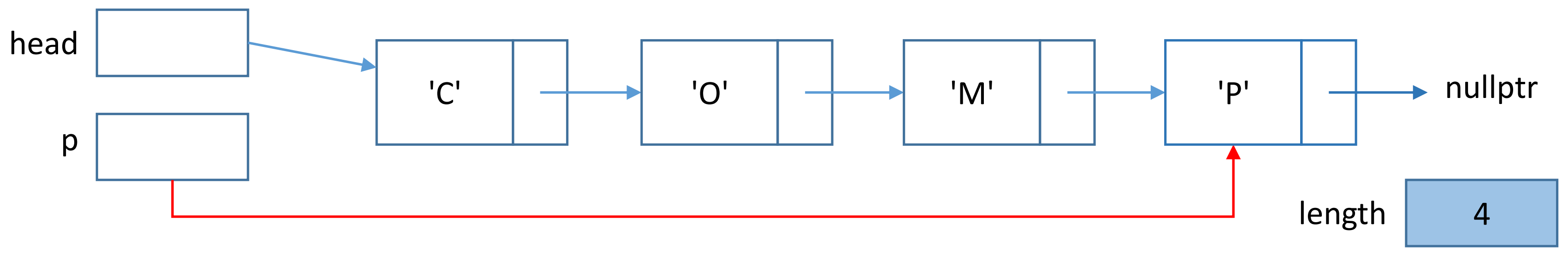


Topic 9: Linked List --- Demonstrating what ll_length does

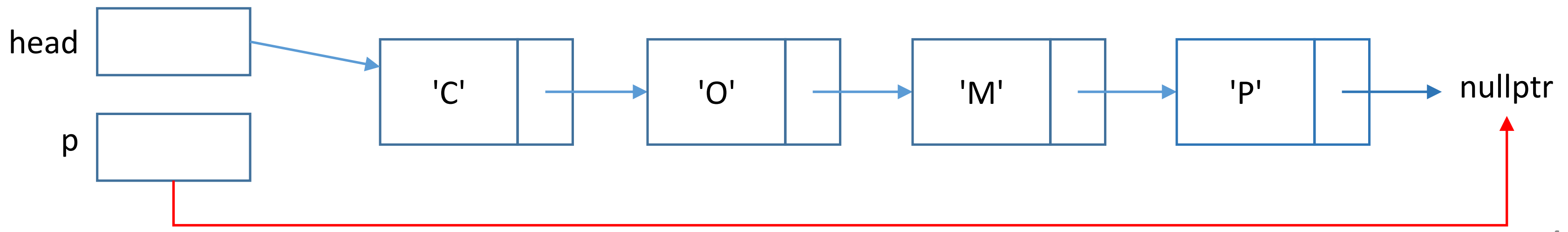
Step 3



Step 4



Step 5



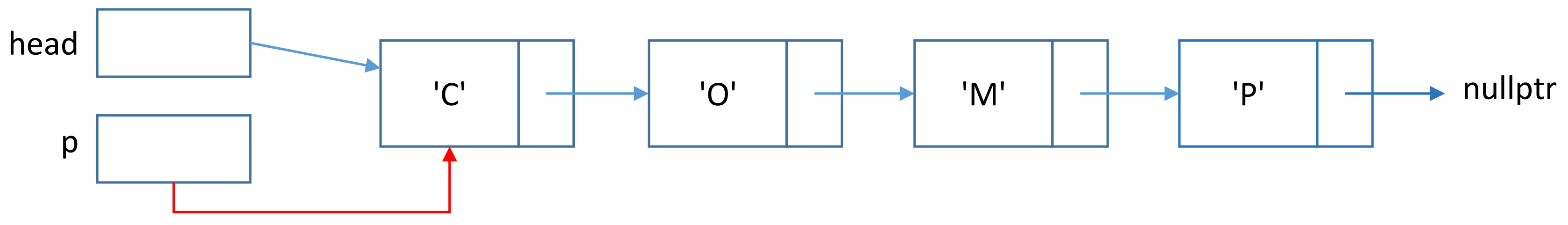
Stop!

Topic 9: Linked List --- Demonstrating what ll_print does

Suppose we pass head pointer to ll_print

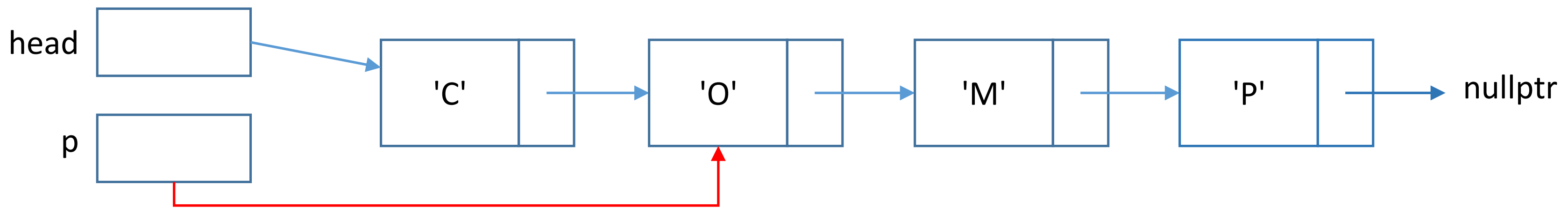
Output:

Step 1



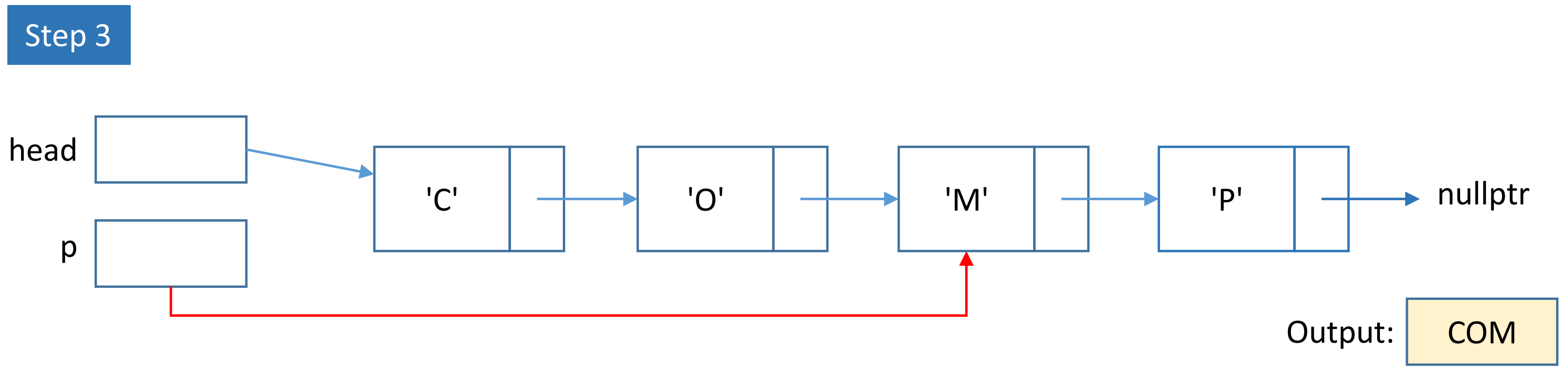
Output: C

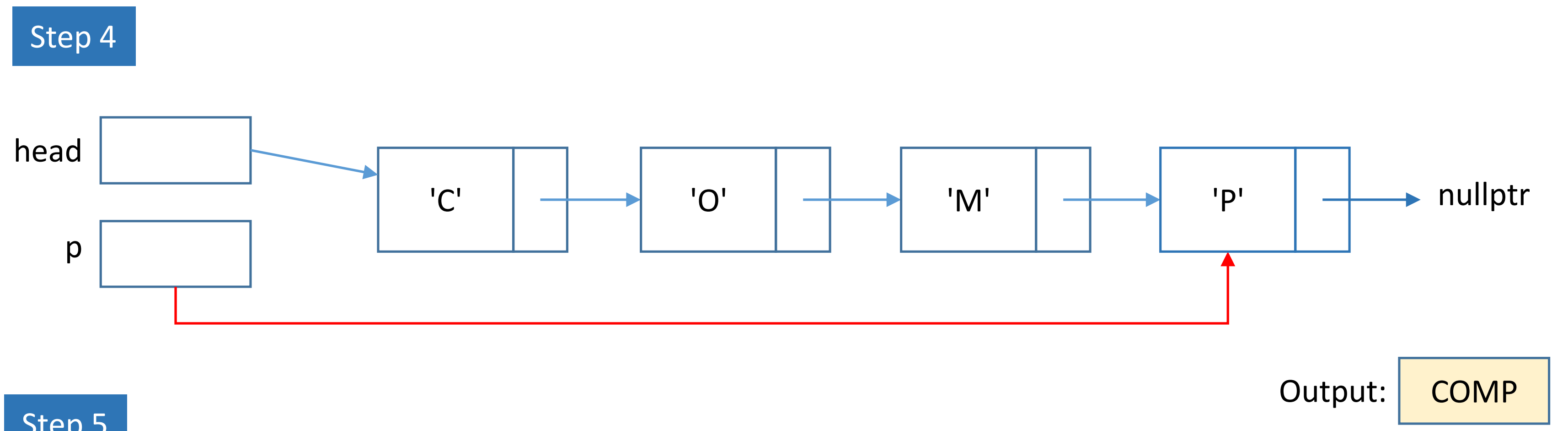
Step 2

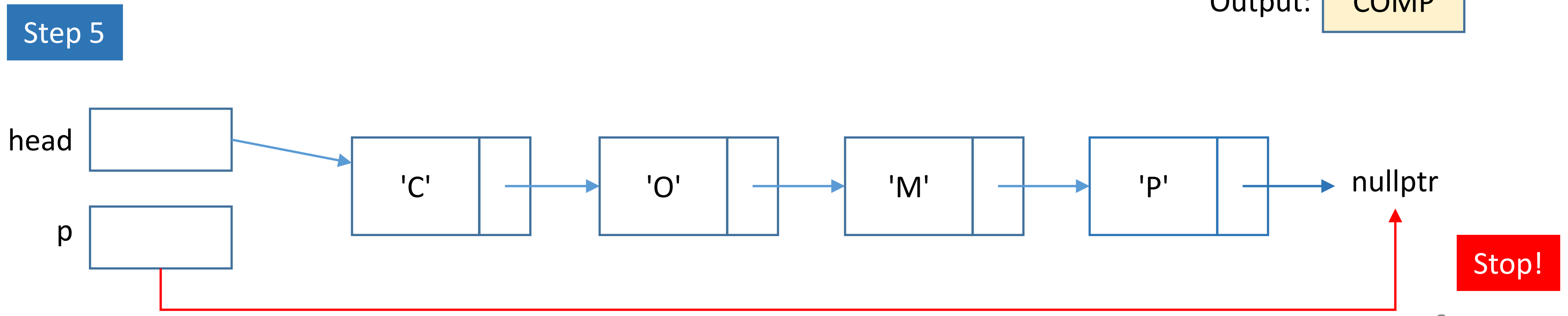


Output: CO

Topic 9: Linked List --- Demonstrating what ll_print does

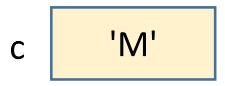




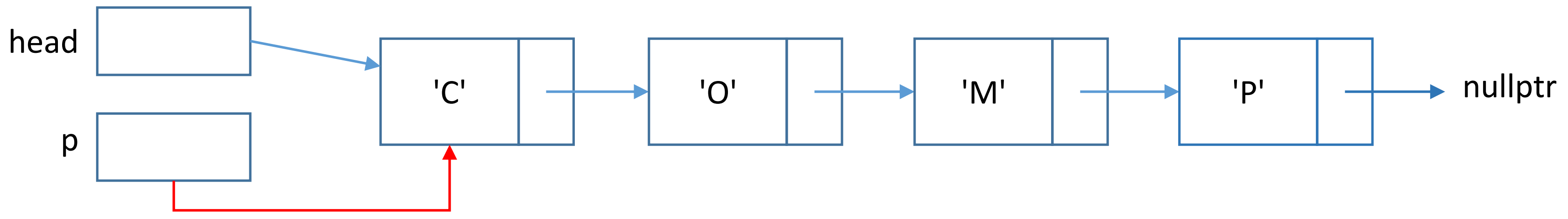


Topic 9: Linked List --- Demonstrating what ll_search does

Suppose we pass head pointer and character 'M' to ll_search

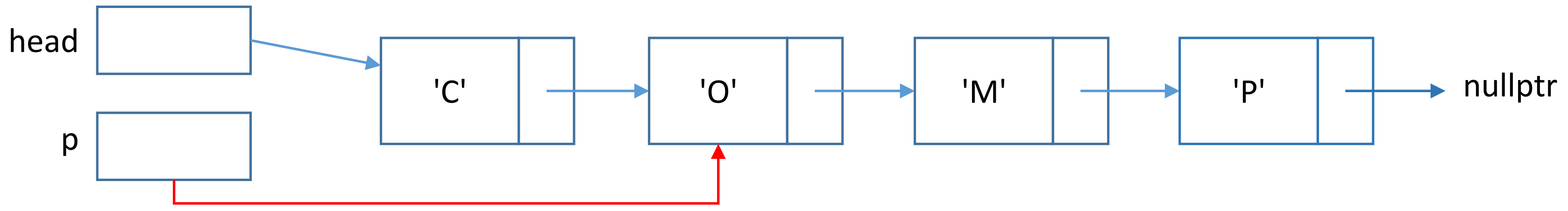


Step 1



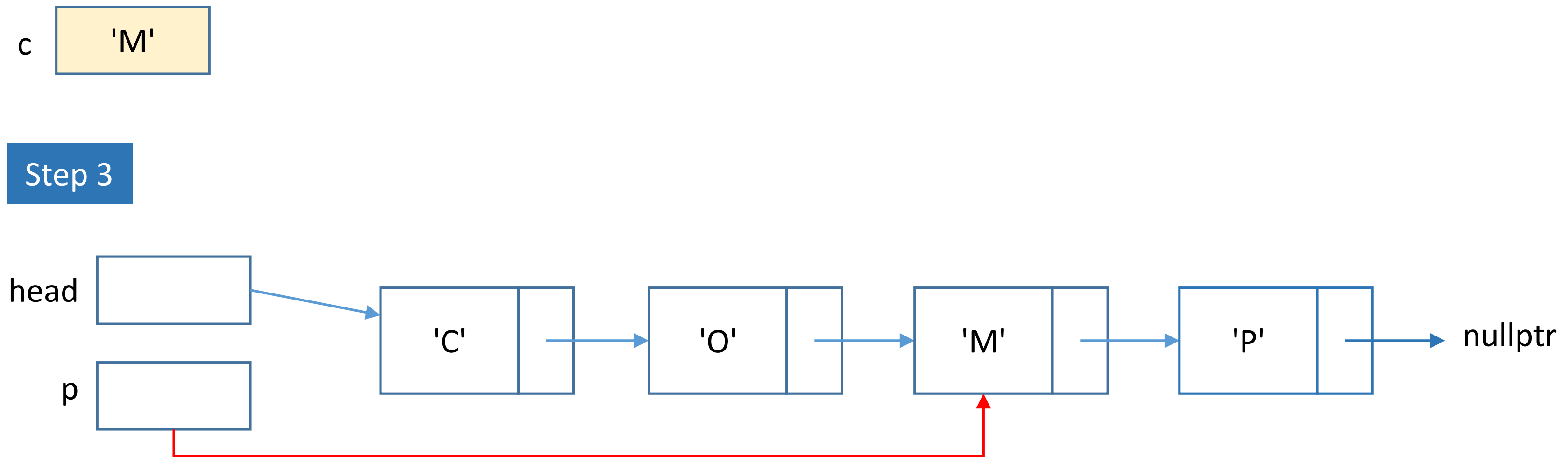
p->data == c? false

Step 2



p->data == c? false

Topic 9: Linked List --- Demonstrating what ll_search does

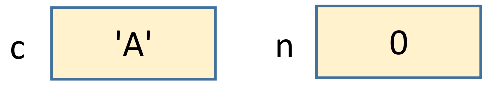


p->data == c? true

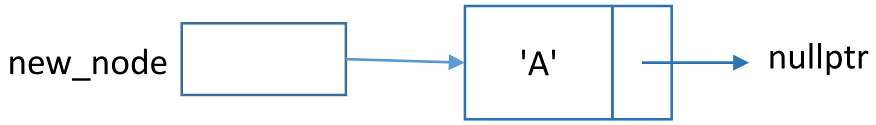
Return pointer p!

Topic 9: Linked List --- Demonstrating what ll_insert does

Suppose we pass head pointer, character 'A', and 0 to ll_insert

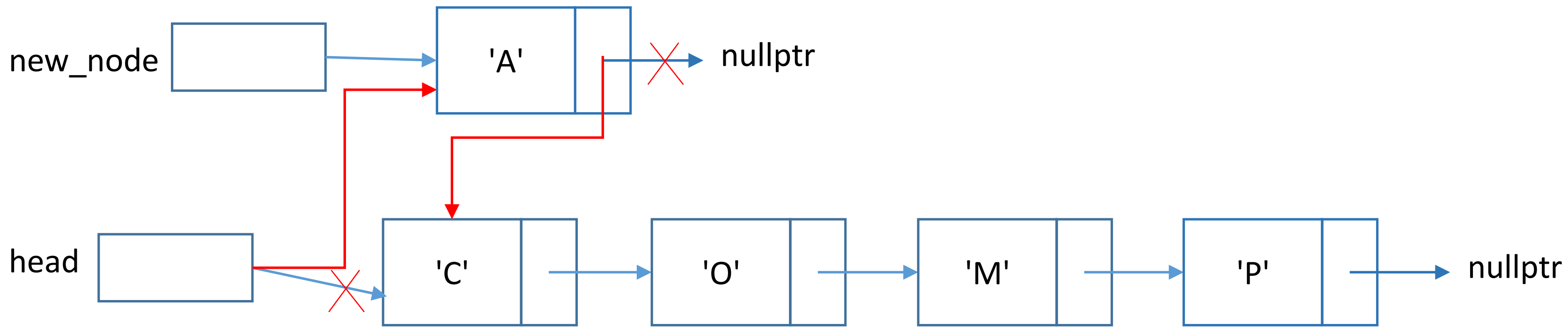


Step 1



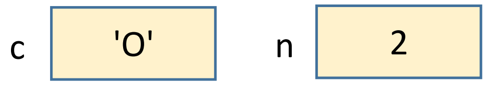
Step 2

n == 0? true

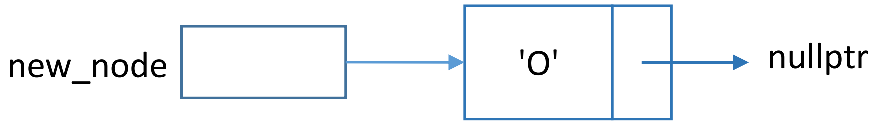


Topic 9: Linked List --- Demonstrating what ll_insert does

Suppose we pass head pointer, character 'O', and 2 to ll_insert

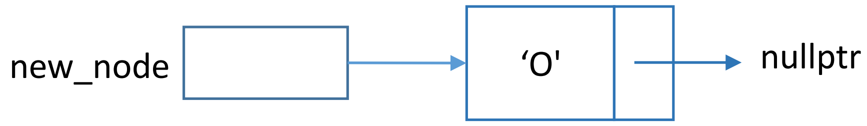


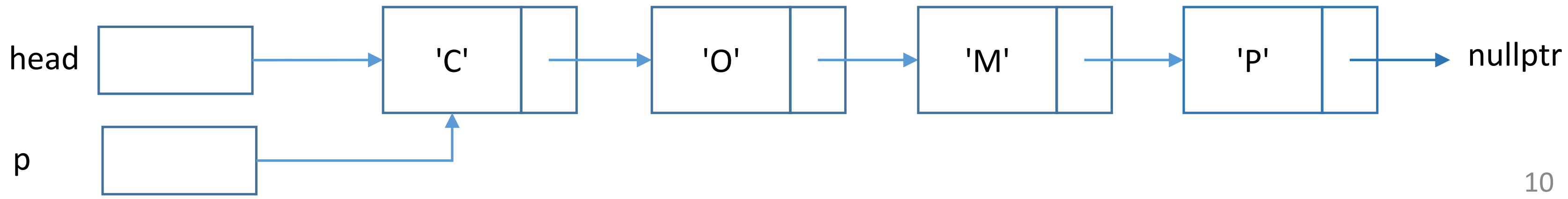
Step 1



Step 2

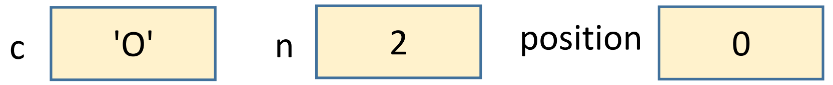
n == 0 || head == nullptr ? false



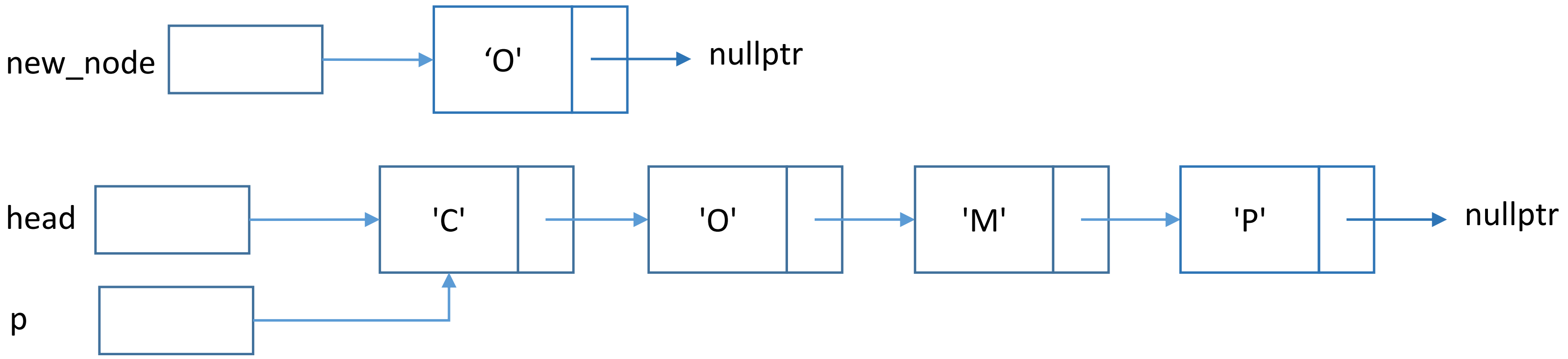


Topic 9: Linked List --- Demonstrating what ll_insert does

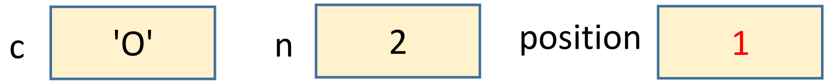
Step 3



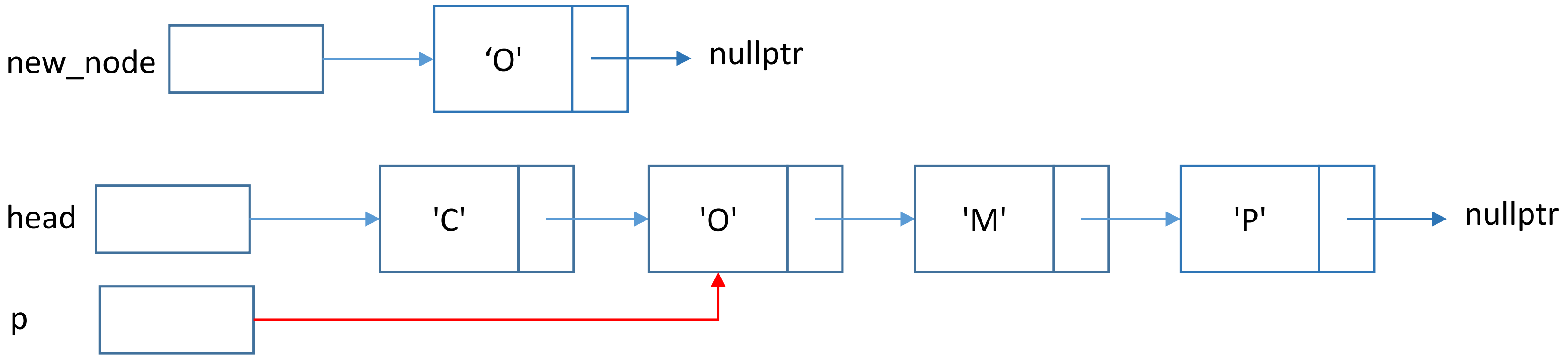
position < n – 1 && p->next != nullptr? true → Execute ;



Step 4



p = p->next, ++position

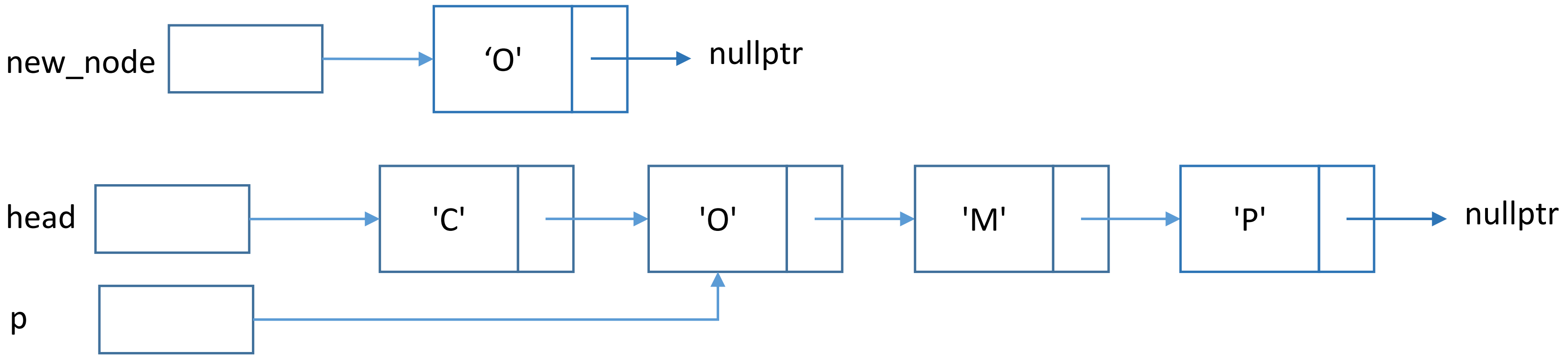


Topic 9: Linked List --- Demonstrating what ll_insert does

Step 4

c	n	position
'O'	2	1

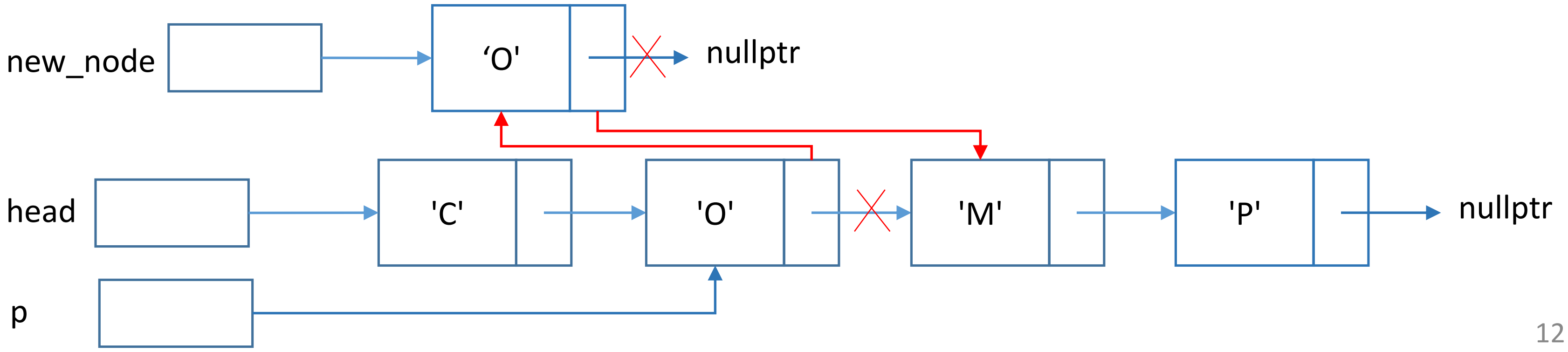
position < n – 1 && p->next != nullptr? false → Leave for loop



Step 5

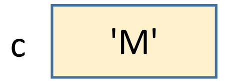
c	n	position
'O'	2	1

```
new_cnode->next = p->next;
p->next = new_cnode;
```

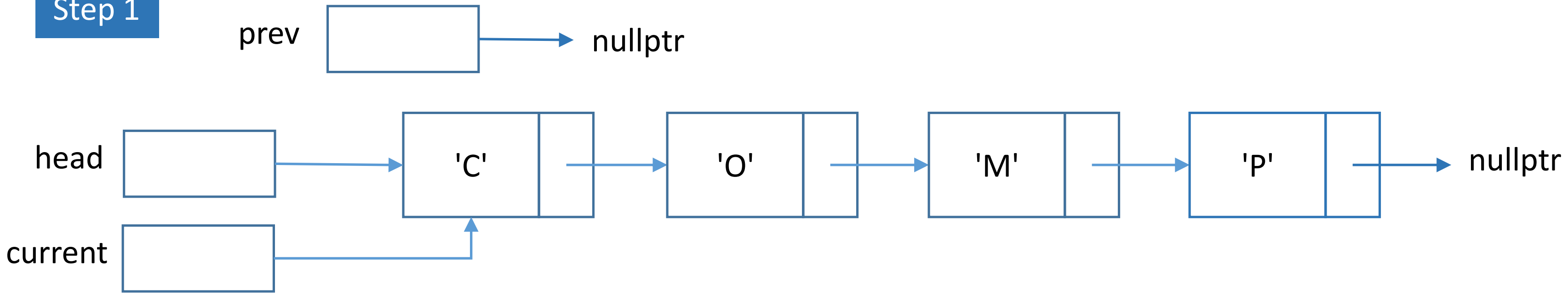


Topic 9: Linked List --- Demonstrating what ll_delete does

Suppose we pass head pointer, character 'M' to ll_delete

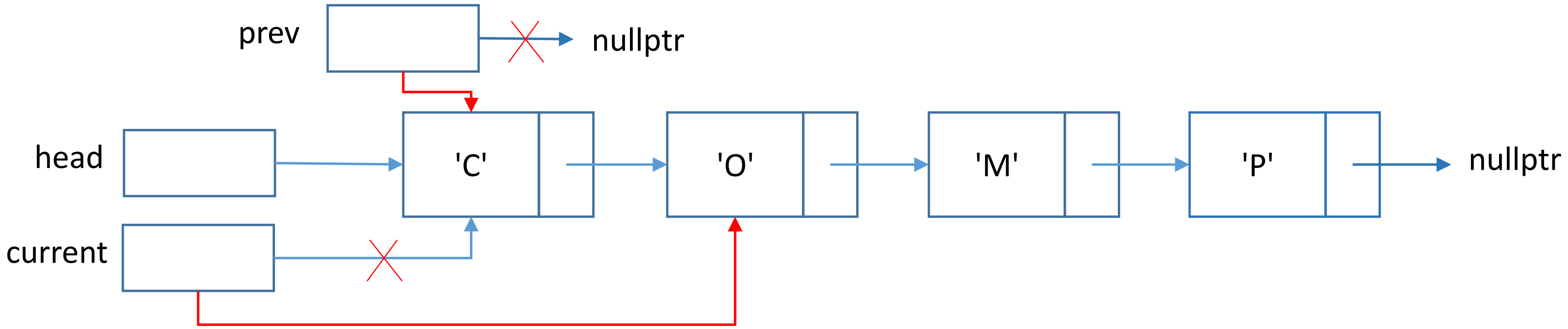


Step 1

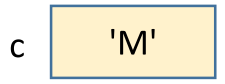


Step 2

current != nullptr && current->data != c? true

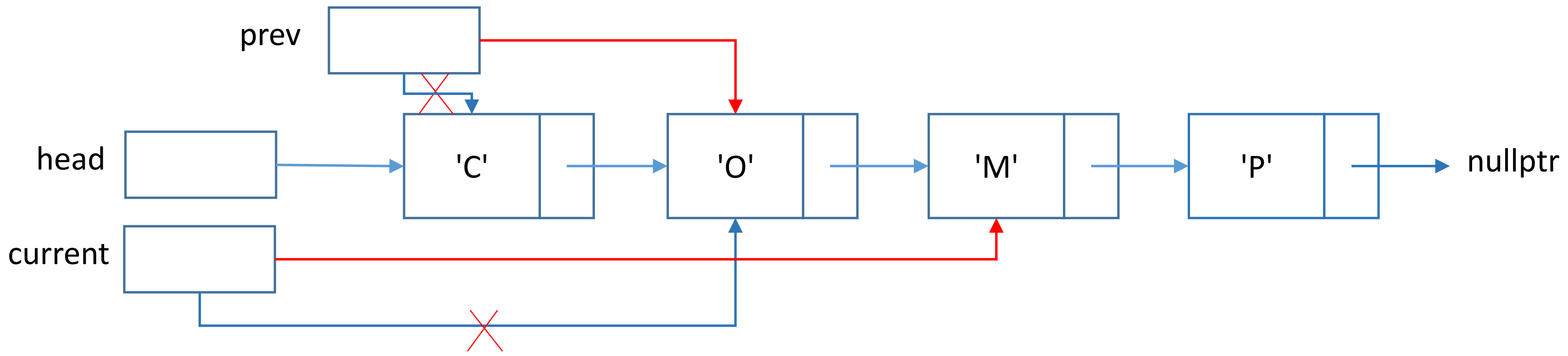


Topic 9: Linked List --- Demonstrating what ll_delete does



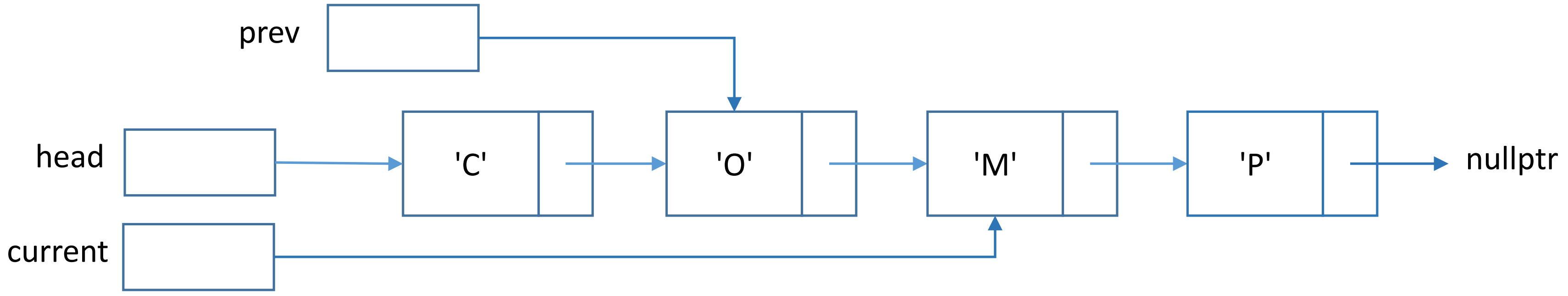
Step 3

current != nullptr && current->data != c? true

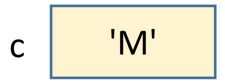


Step 4

current != nullptr && current->data != c? false → Leave while loop!



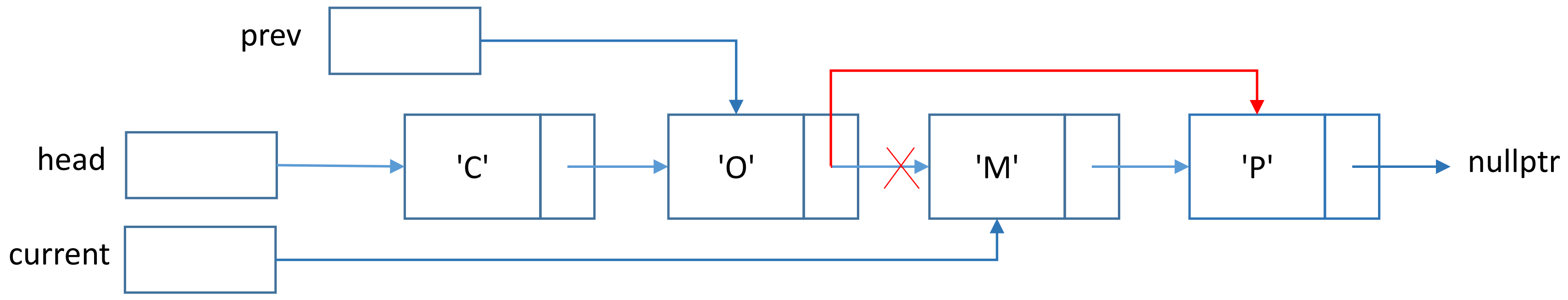
Topic 9: Linked List --- Demonstrating what ll_delete does



Step 5

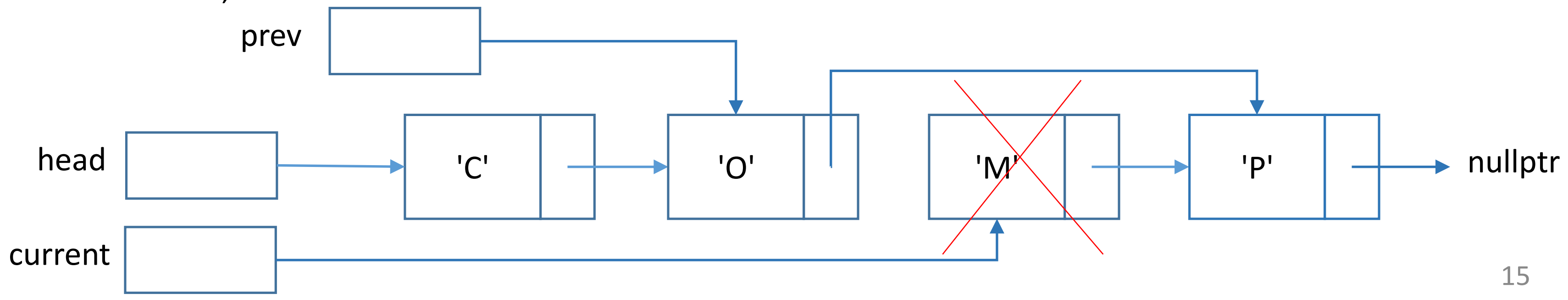
current != nullptr? true

current == head? false → prev->next = current->next;



Step 6

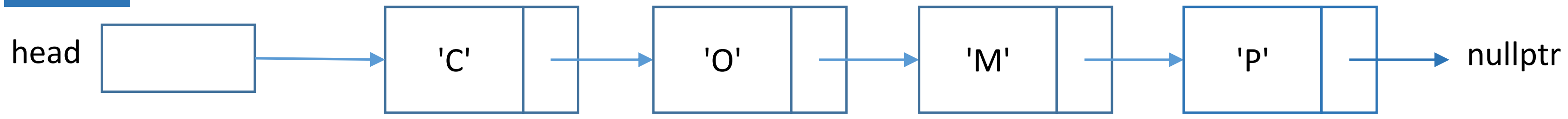
delete current;



Topic 9: Linked List --- Demonstrating what ll_delete_all does

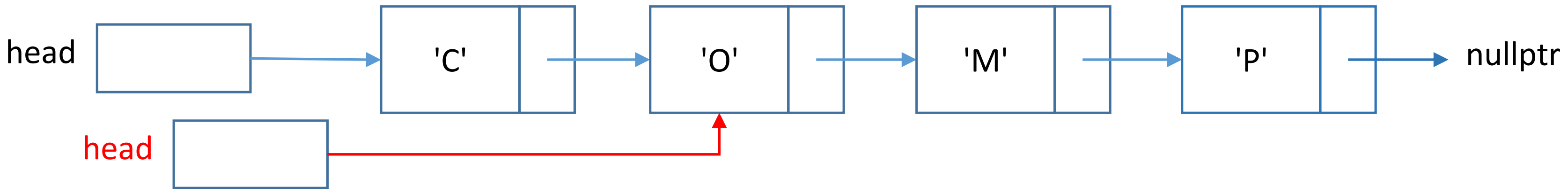
Suppose we pass head pointer to ll_delete

Step 1



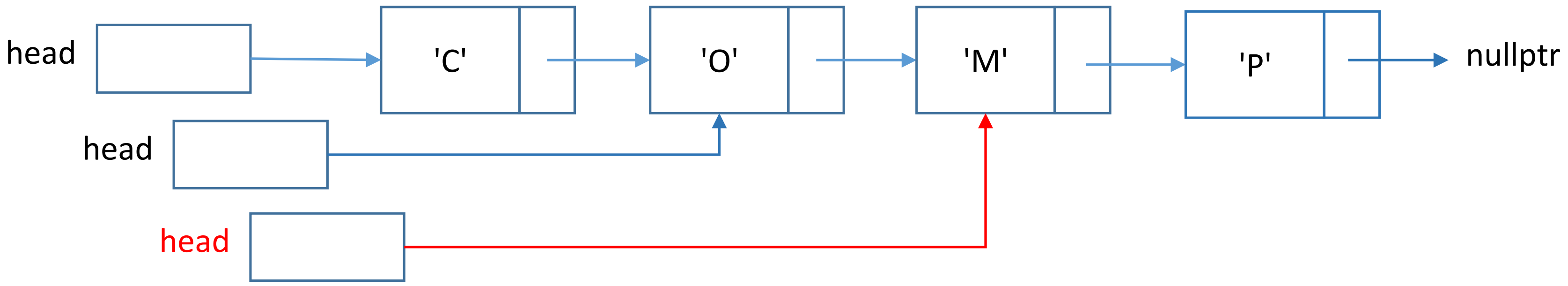
head == nullptr? false → ll_delete_all(head->next);

Step 2



head == nullptr? false → ll_delete_all(head->next);

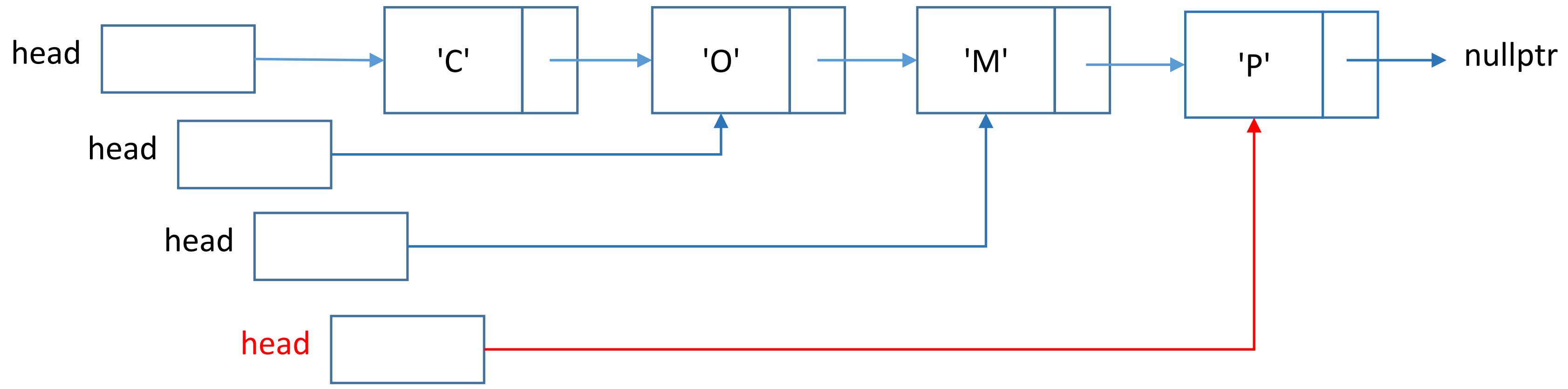
Step 3



head == nullptr? false → ll_delete_all(head->next);

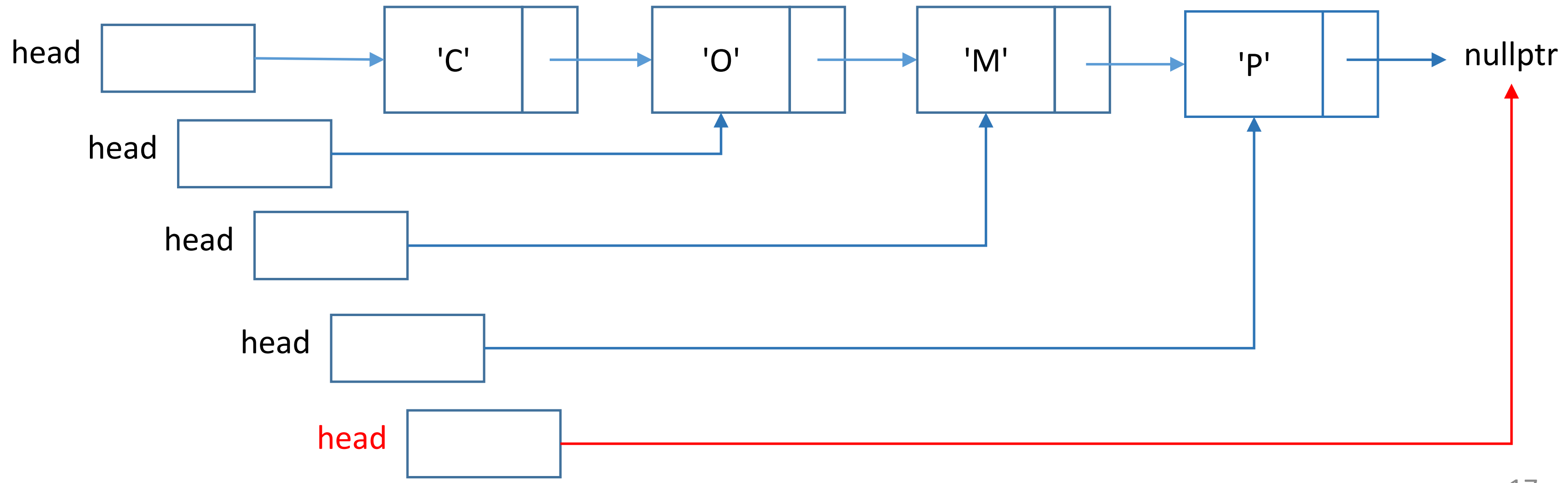
Topic 9: Linked List --- Demonstrating what ll_delete_all does

Step 4



head == nullptr? false → ll_delete_all(head->next);

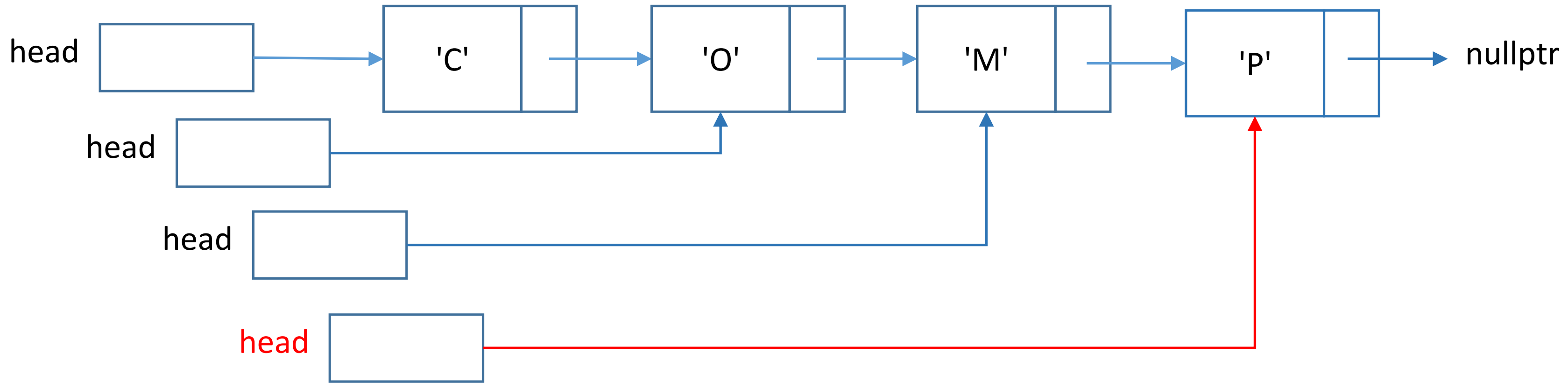
Step 5



head == nullptr? true → return;

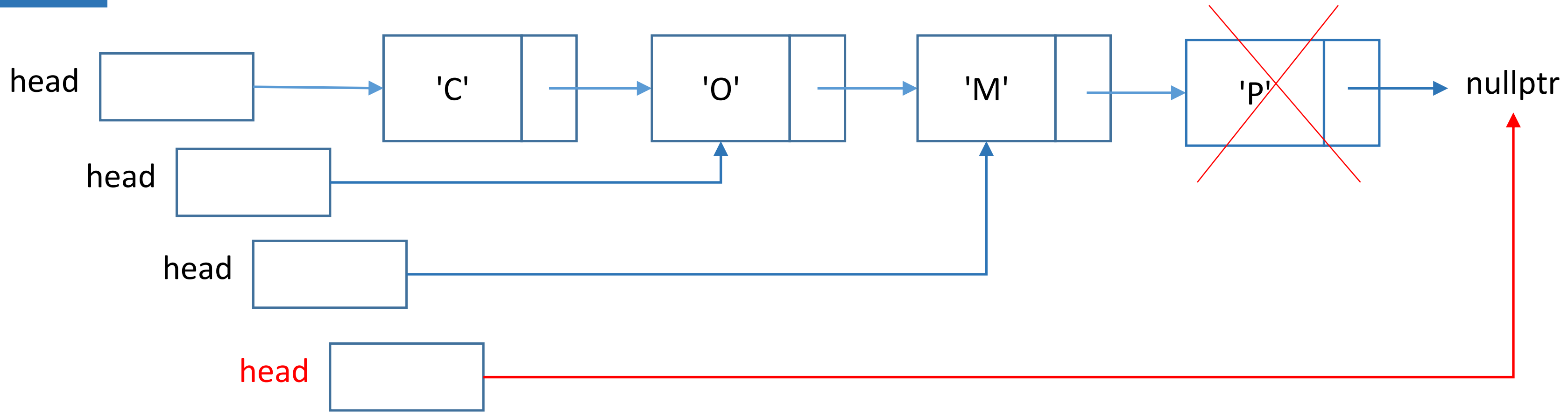
Topic 9: Linked List --- Demonstrating what ll_delete_all does

Step 6



delete head; head = nullptr;

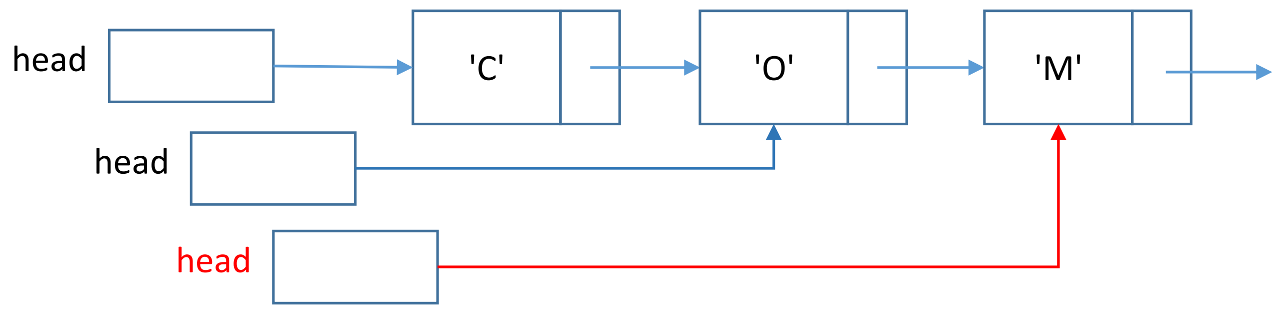
Step 7



delete head; head = nullptr; leave ll_delete_all

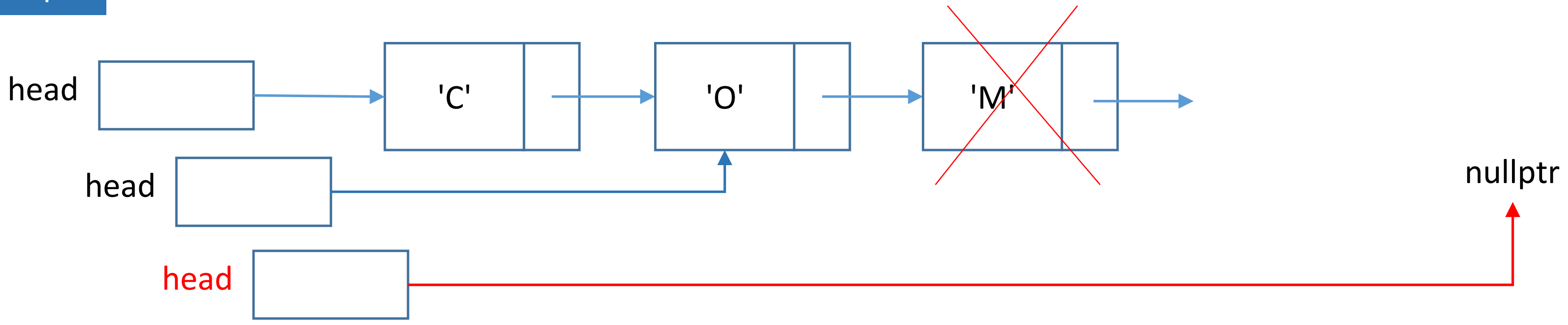
Topic 9: Linked List --- Demonstrating what ll_delete_all does

Step 8



delete head; head = nullptr; leave ll_delete_all

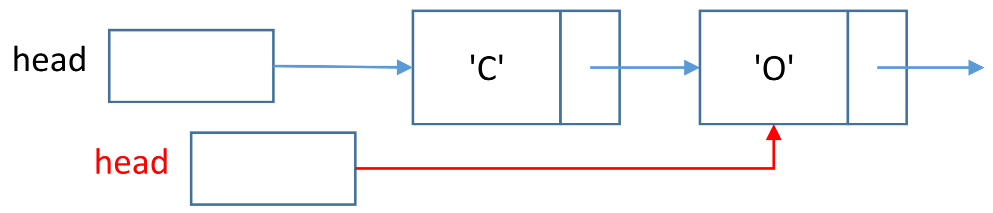
Step 9



delete head; head = nullptr; leave ll_delete_all

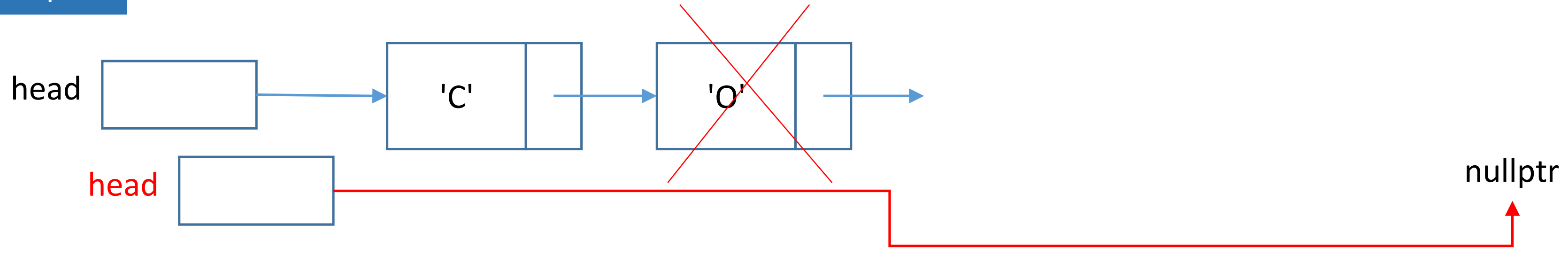
Topic 9: Linked List --- Demonstrating what ll_delete_all does

Step 10



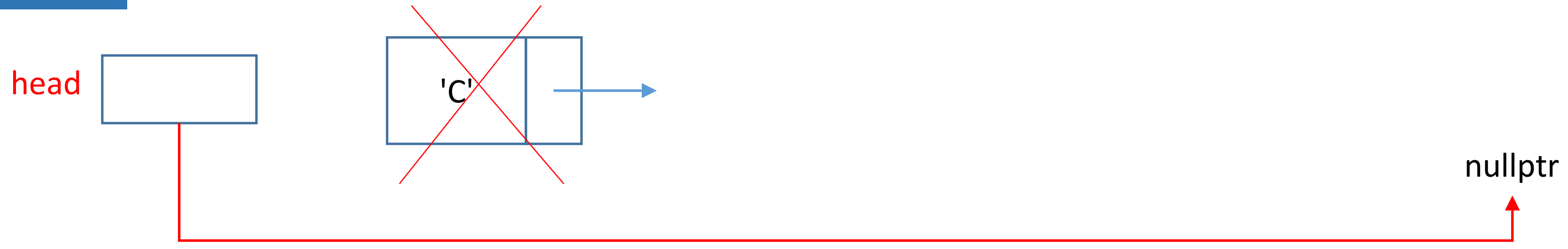
delete head; head = nullptr; leave ll_delete_all

Step 11



delete head; head = nullptr; leave ll_delete_all

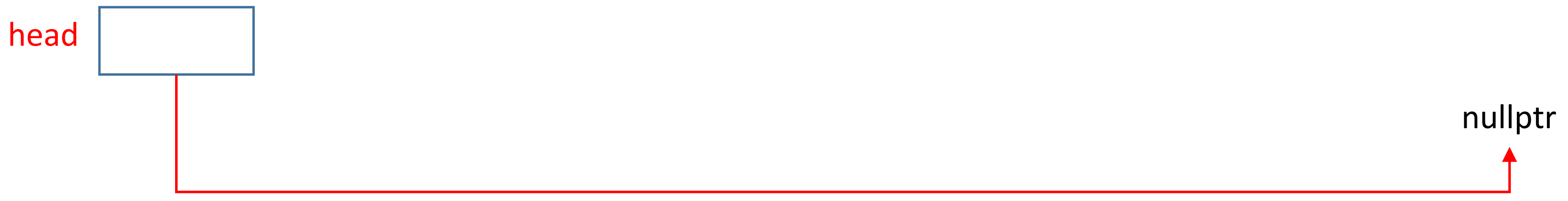
Step 12



delete head; head = nullptr; leave ll_delete_all

Topic 9: Linked List --- Demonstrating what ll_delete_all does

Step 13



head == null? true → return;