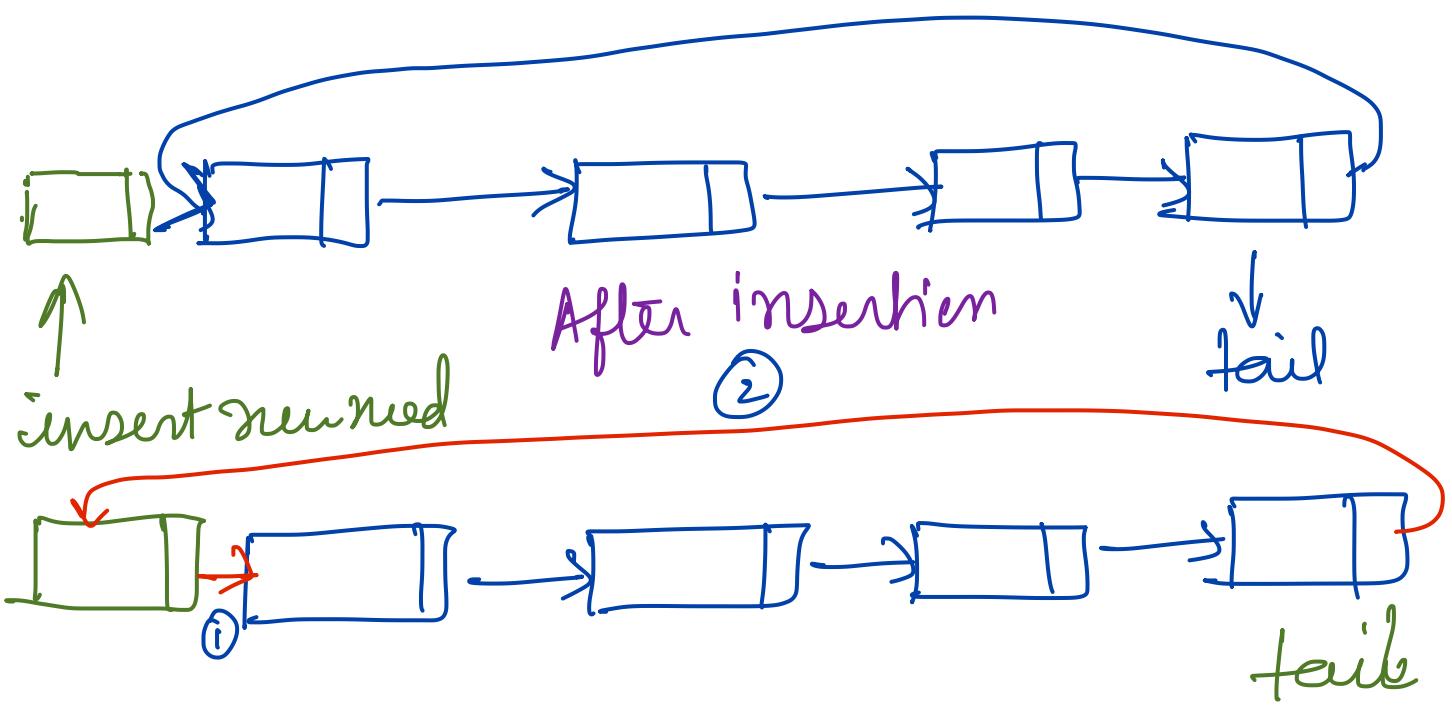


Circular Single LL

* If only 'tail' information is also maintaining.

① InsertAtbeg

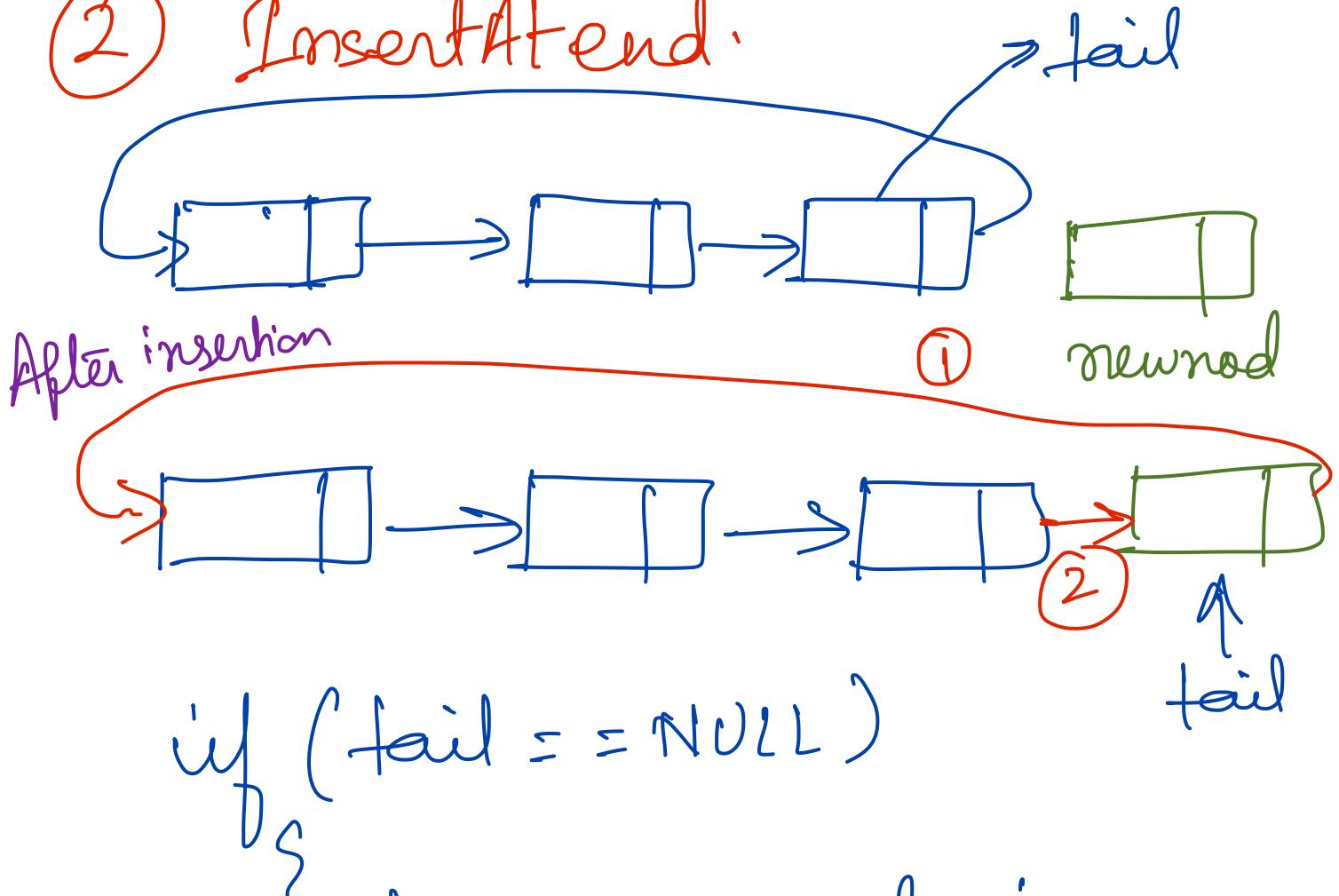


```
if ( tail == NULL )
```

```
    tail = newnode  
else {  
    newnode->next = tail->next  
    tail->next = newnode  
}
```

②

InsertAtEnd:



if (tail == NULL)

tail = newnode;

}

else {

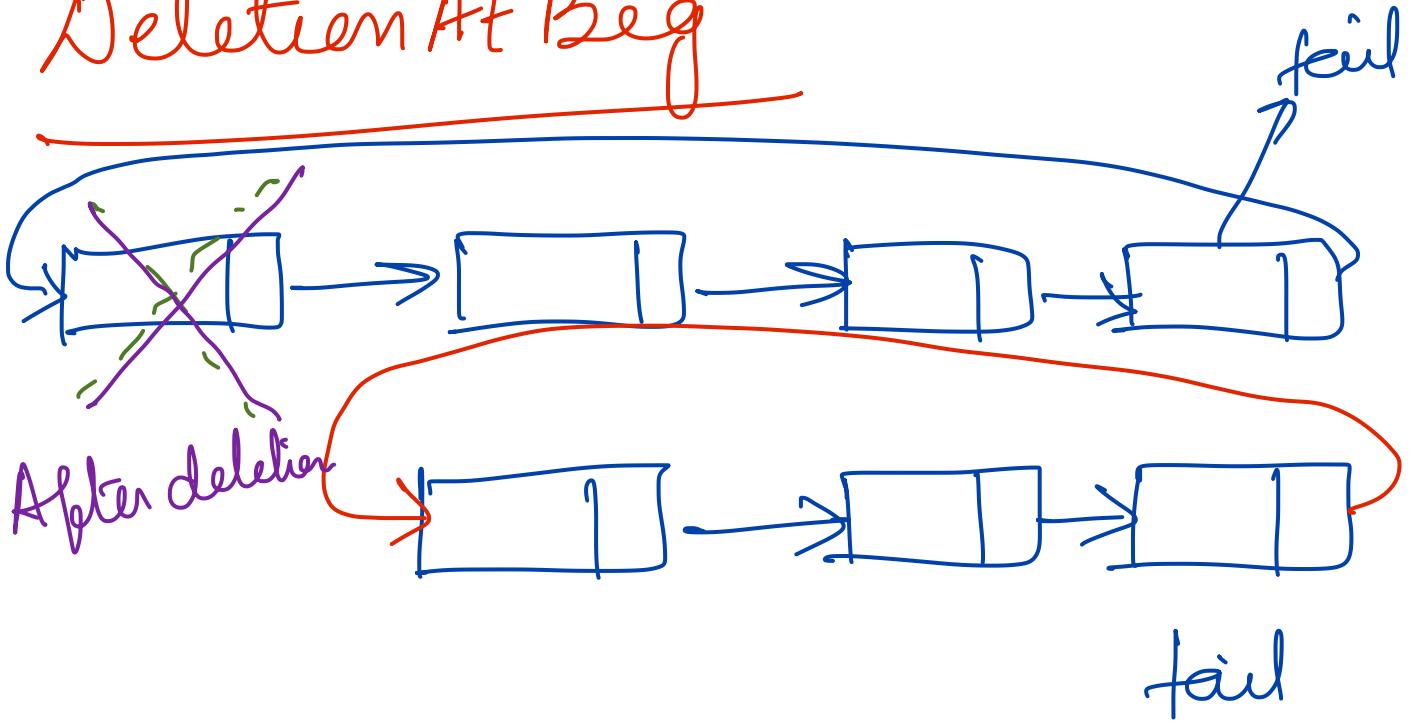
newnode->next = tail->next;

tail->next = newnode;

tail = newnode

}

Deletion At Beg

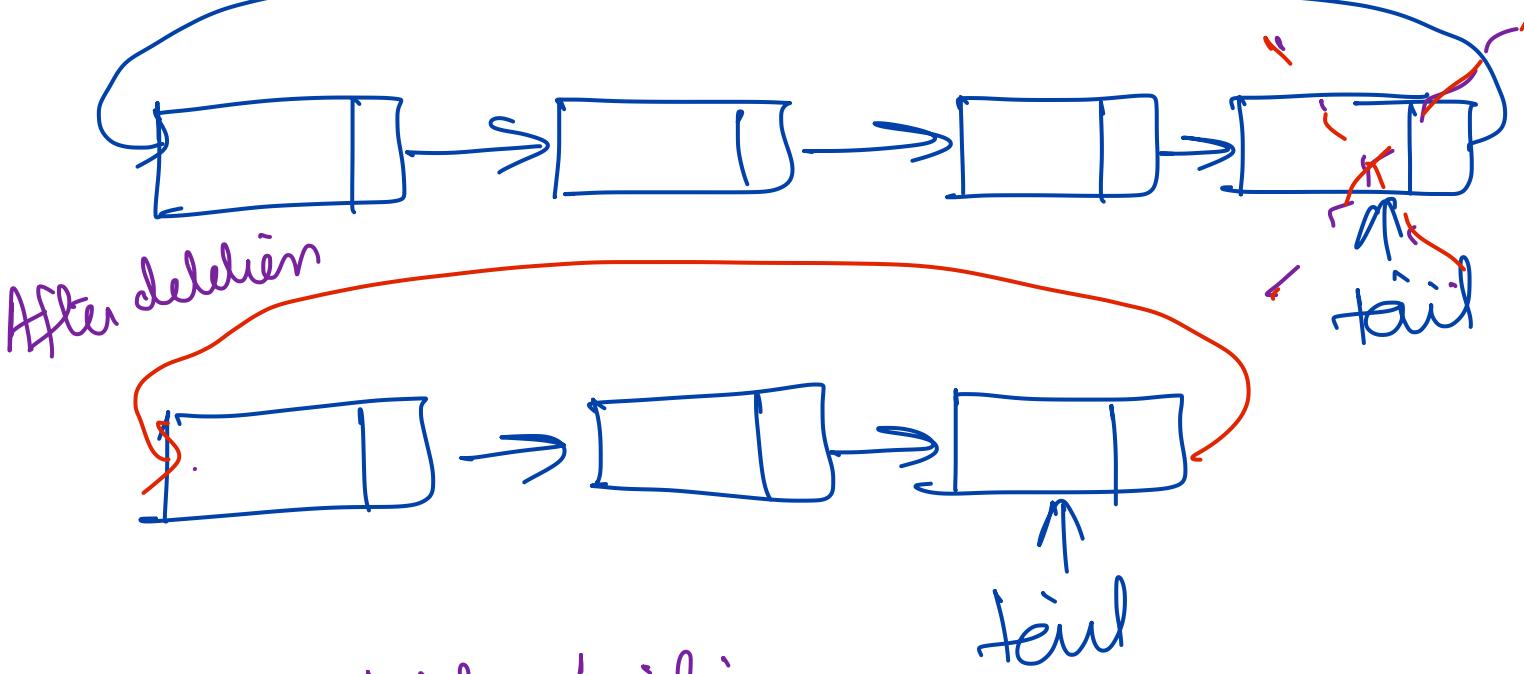


```
temp = tail->next ;
```

```
tail->next = temp->next ;
```

```
free(temp);
```

Deletion At End



prev-teil = teil ;

temp = teil \rightarrow next

while (temp \rightarrow next != tail)

{

 temp = temp \rightarrow next

}

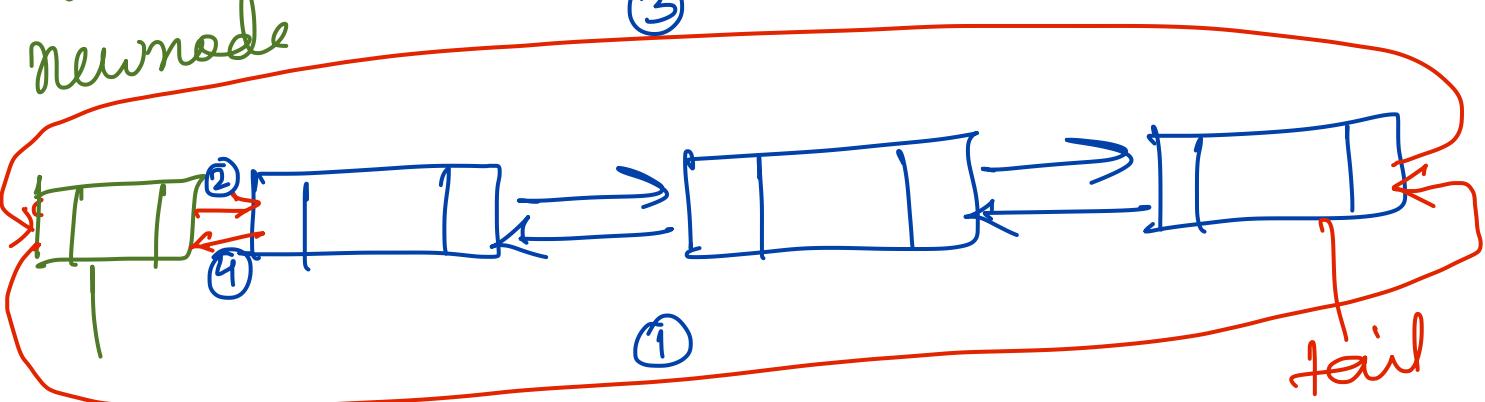
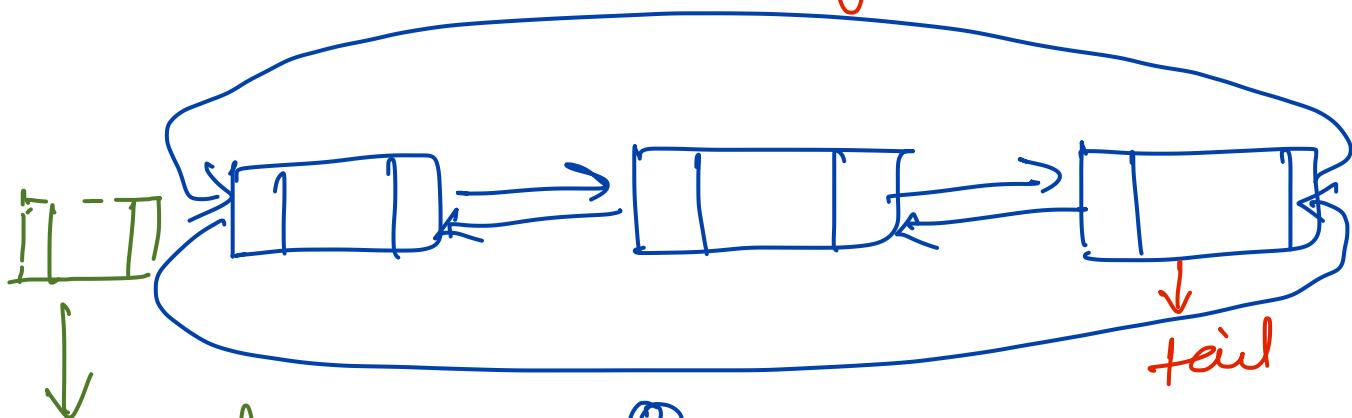
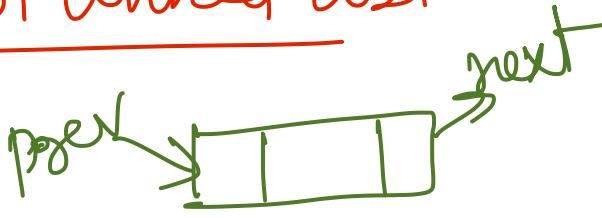
 temp \rightarrow next = tail \rightarrow next

 tail = temp

 free(prev-teil);

Doubly Circular linked list

Insertion At beg



if (tail == NULL)

{

 tail = newnode

 newnode->prev = newnode;

 newnode->next = newnode;

else {

 newnode->prev = tail

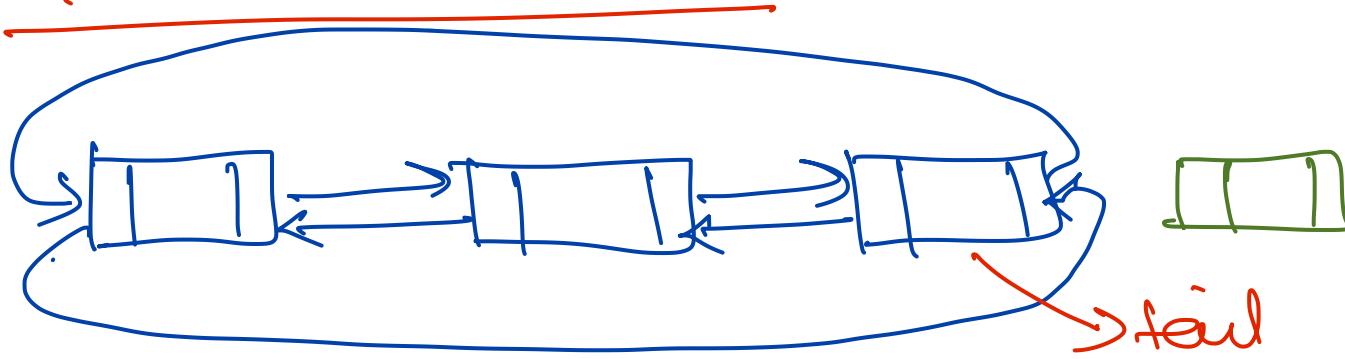
 newnode->next = tail->next

 tail->next->prev = newnode;

 tail->next = newnode;

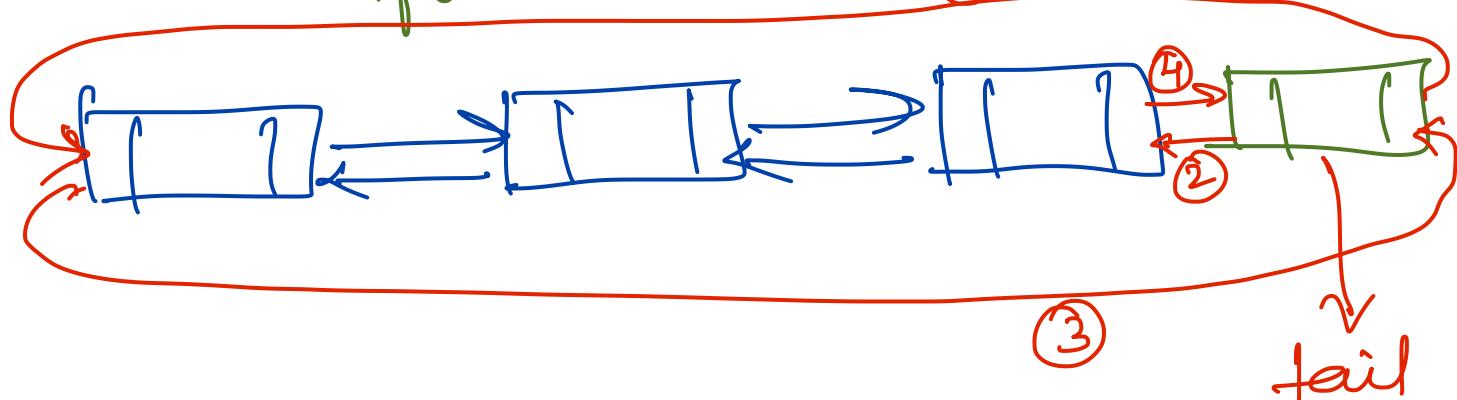
}

Insert At End.



After insertion

①



③

tail

if (tail == NULL)

{

 tail = newnode;

 newnode->next = newnode;

 newnode->prev = newnode;

}

else {

 newnode->next = tail->next;

 newnode->prev = tail;

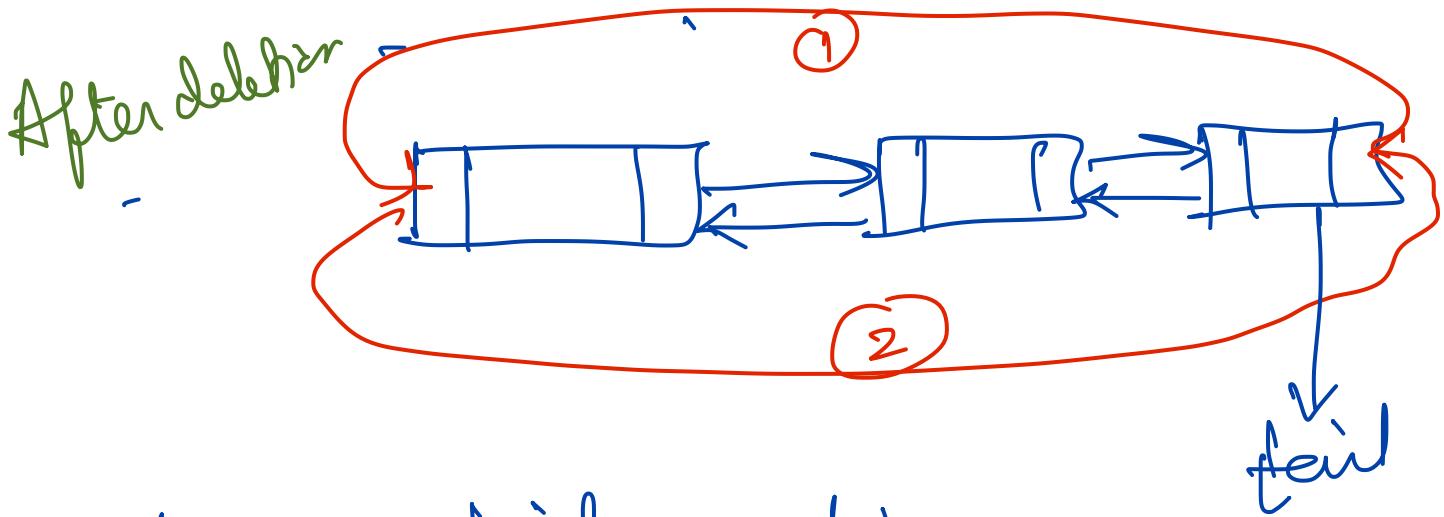
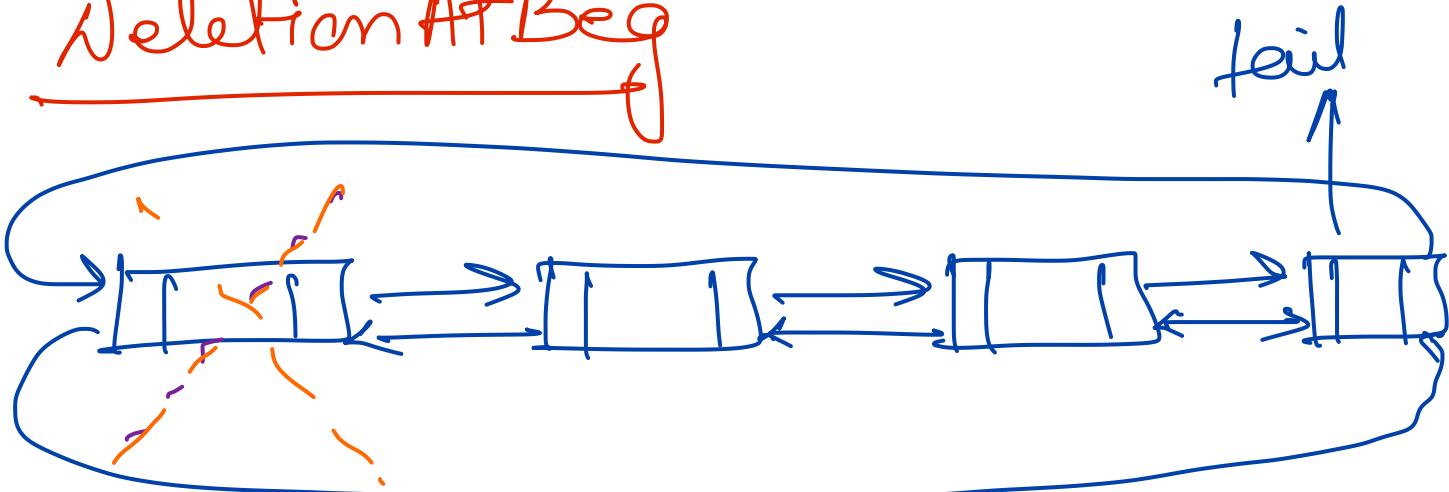
 tail->next->prev = newnode;

 tail->next = newnode;

 tail = newnode

}

Deletion At Beg



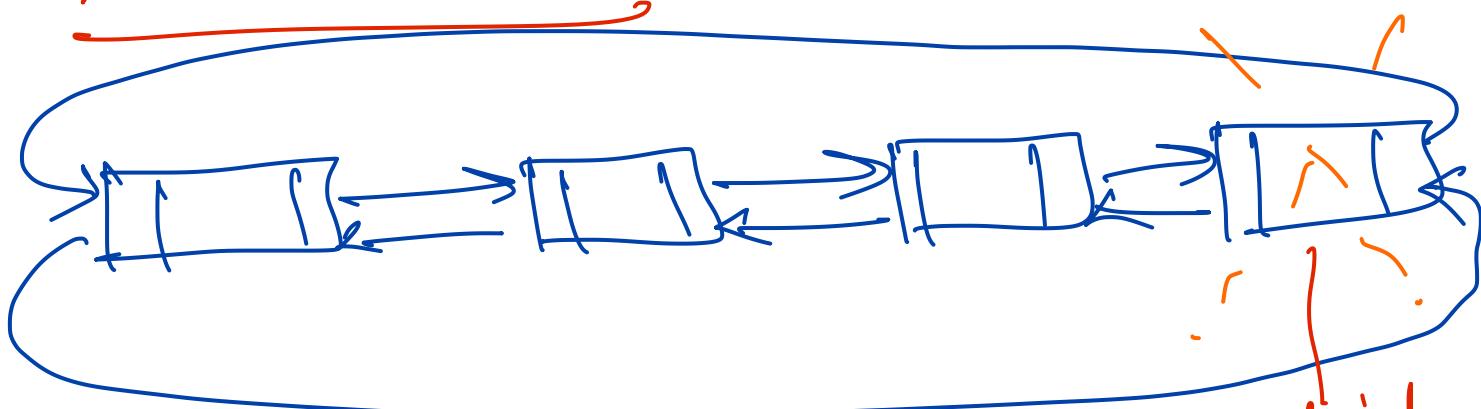
$\text{temp} = \text{tail} \rightarrow \text{next};$

$\text{tail} \rightarrow \text{next} = \text{temp} \rightarrow \text{next};$

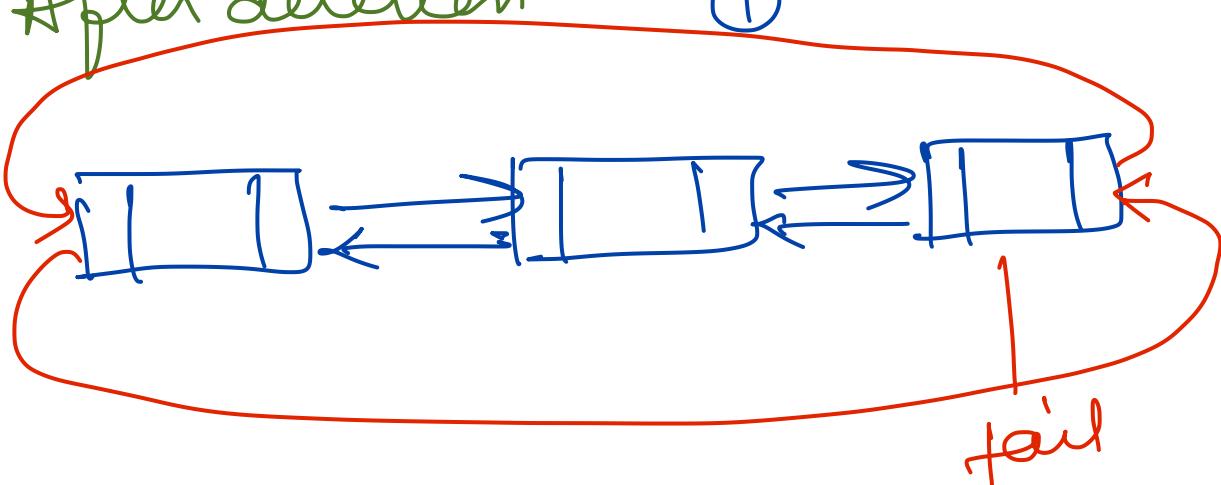
$\text{temp} \rightarrow \text{next} \rightarrow \text{prev} = \text{tail}$

$\text{free}(\text{temp})$

Deletion At End



After deletion ①



$\text{temp} = \text{tail};$

$\text{tail} \rightarrow \text{prev} \rightarrow \text{next} = \text{tail} \rightarrow \text{next} \rightarrow \text{prev};$

$\text{tail} \rightarrow \text{next} \rightarrow \text{prev} = \text{tail} \rightarrow \text{prev} \rightarrow \text{next};$

$\text{free}(\text{temp});$