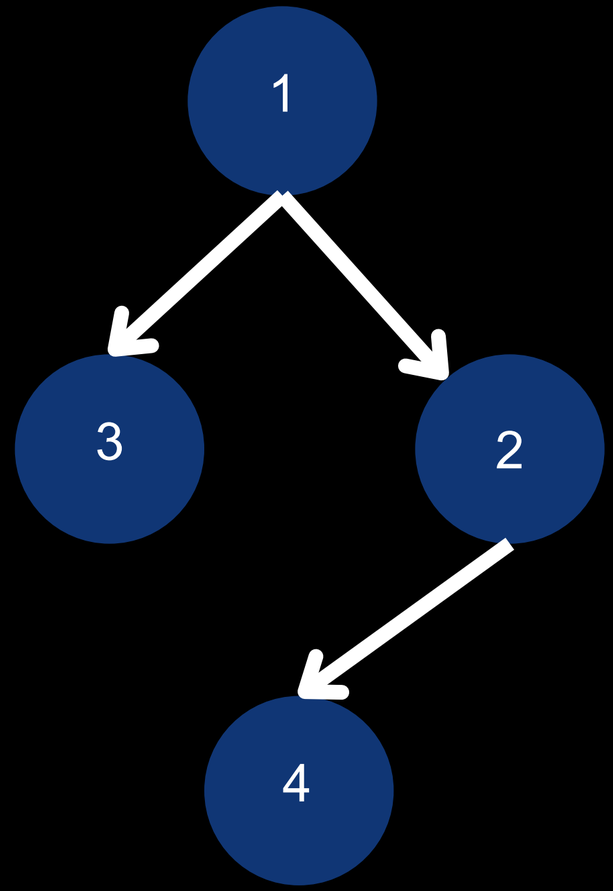
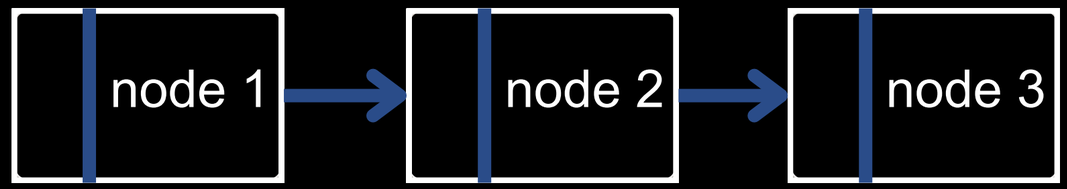
DATA STRUCTURE





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Linked Lists Operations

1- add to the start of linked list

algorithm :

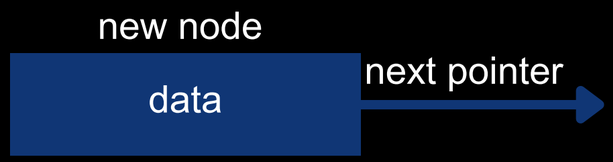
line 1 : Create the node

line 2 : Node of next pointer point to head to link the node to linked list

line 3 : make head pointer point to new Node

line 4 : check If the tail is null (meaning the list was initially empty)

line 5 : make head = tail


new node
data
next pointer


HEAD
TAIL
data
next pointer
data
next pointer
data
next pointer
NULL


HEAD
TAIL
new node
data
next pointer
data
next pointer
data
next pointer
data
next pointer
NULL


HEAD
TAIL
new node
data
next pointer
data
next pointer
data
next pointer
data
next pointer
NULL

2 - add to the end of linked list

algorithm :

line 1: Create the node

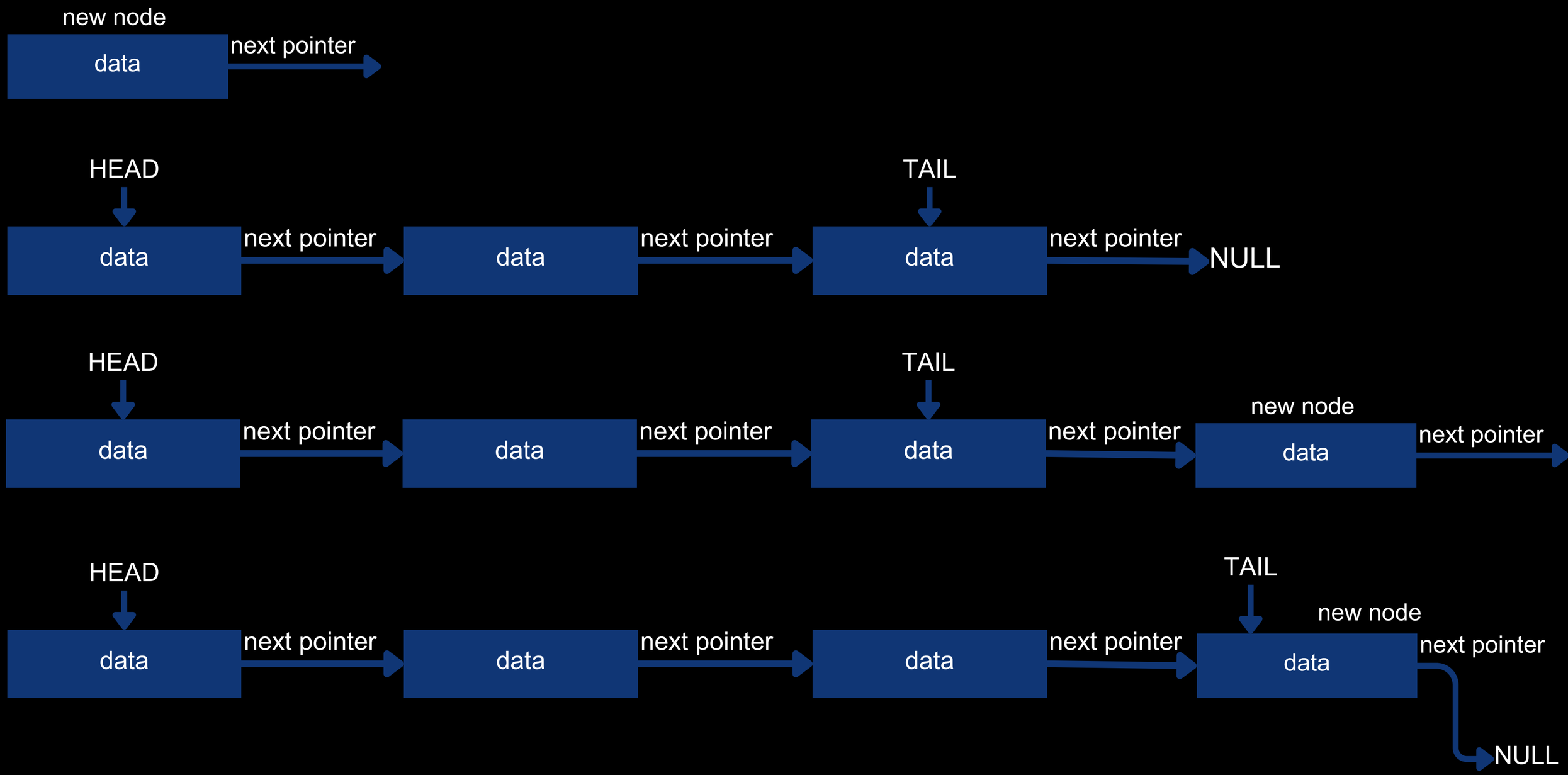
line 2: Check if tail == null and head == null then the list is empty

if that's true head = tail = node

Else

line 1: The last element (tail) next pointer = node

line 2: Tail pointer points to node


new node
data
next pointer
HEAD
data
next pointer
data
next pointer
TAIL
data
next pointer
NULL
HEAD
data
next pointer
data
next pointer
TAIL
data
next pointer
new node
data
next pointer
HEAD
data
next pointer
data
next pointer
data
next pointer
TAIL
new node
data
next pointer
NULL

3 - delete the first node

line 1: Check if head == tail, that means there is one node or nothing (if true)
head = tail = null;
Else

line 1: Make the current store the head

line 2: Move head to the next node

line 3: Delete the current


HEAD
TAIL
data
next pointer
data
next pointer
data
next pointer
data
next pointer
NULL


CUURENT
HEAD
TAIL
data
next pointer
data
next pointer
data
next pointer
data
next pointer
NULL

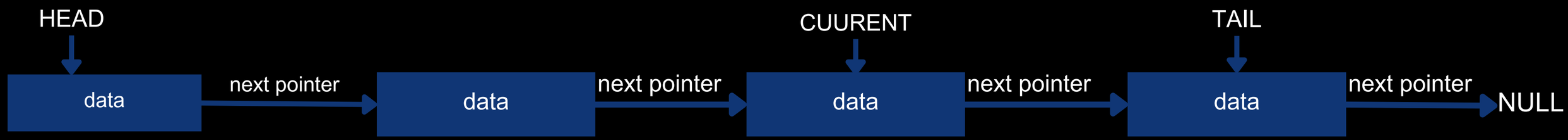

HEAD
TAIL
data
next pointer
data
next pointer
data
next pointer
NULL

4 - Delete the last node

line 1: Check if head == tail, that means there is one node or nothing (if true)
delete head
head = tail = null;

Else
move the current to the next node until it point to the last node before tail
delete tail
make tail point to current
make tail of next point to null


HEAD
data
next pointer
data
next pointer
data
next pointer
TAIL
data
next pointer
NULL


HEAD
data
next pointer
data
next pointer
CUURENT
data
next pointer
TAIL
data
next pointer
NULL

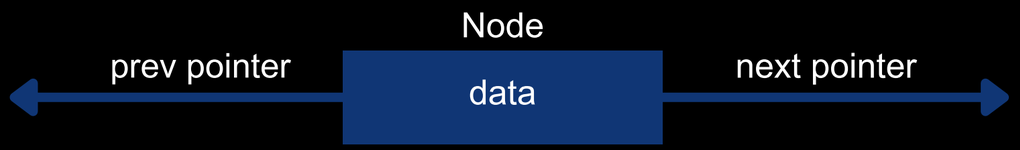

HEAD
data
next pointer
data
next pointer
CUURENT
TAIL
data
next pointer
NULL

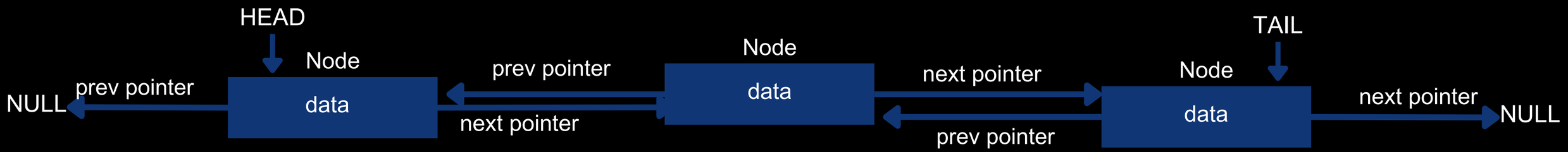
Doubly Linked List

A Doubly Linked List (DLL) is a two-way list in which each node has two pointers

Each node have 2 pointers

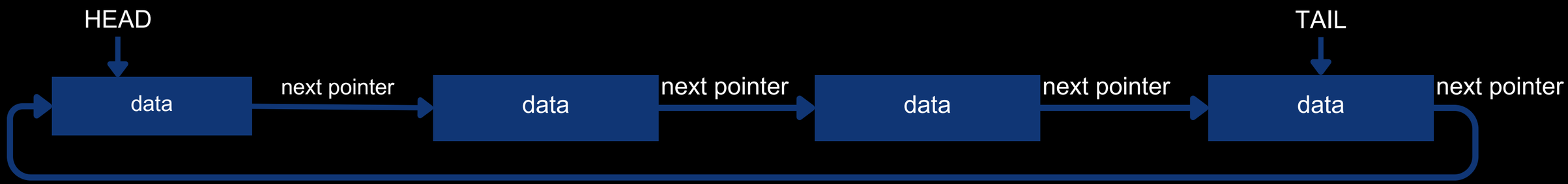
pointer 1 for next node , pointer 2 for the prev node





Circular Singly Linked List

In a circular Singly linked list, the last node of the list contains a pointer to the first node of the list



Thanks

All code and examples can be found on GitHub https://github.com/ESSAMMOHAMED1