Data Structure & Algorithms

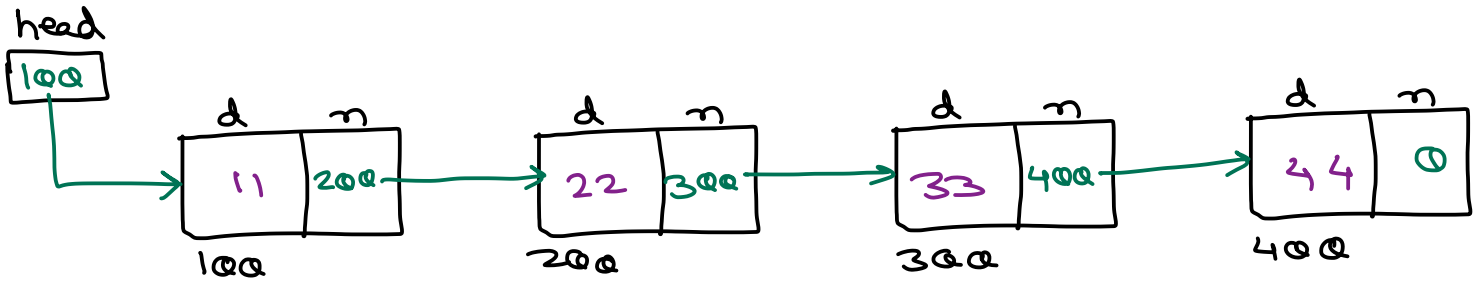
Sunbeam Infotech

Nilesh Ghule

Linked List – Treasure Hunt

- Linked List is list of items linked together.
- Each item in linked list is called as Node.
- Each node contains data and pointer/reference to the next node.
- Linked list is linear data structure.

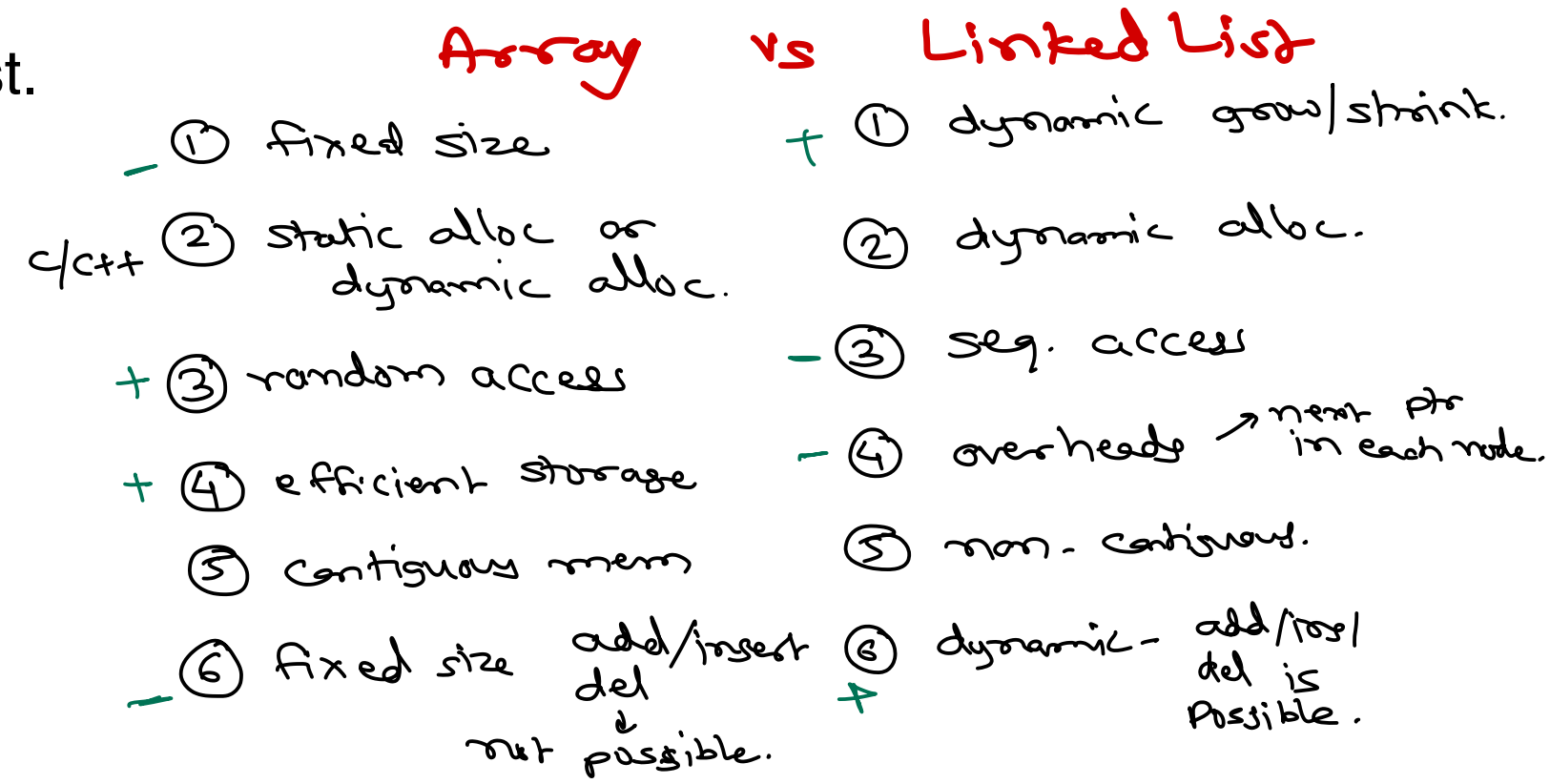
head is addr of first node in the list.



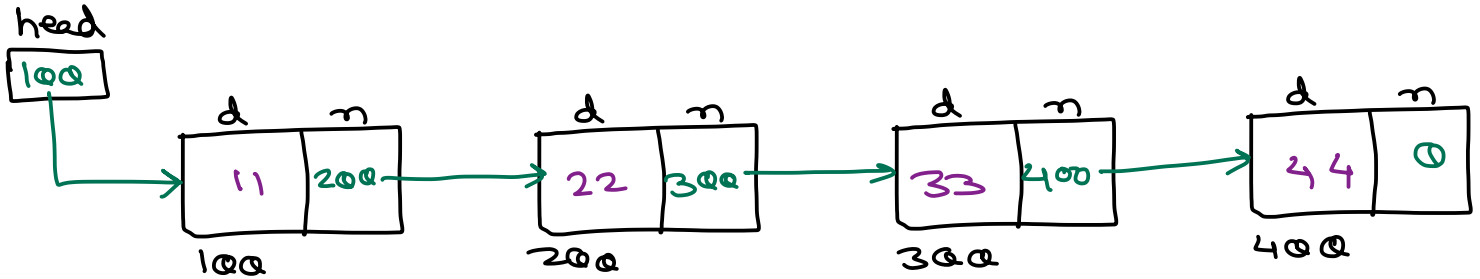
- Linked list ADT
  - addFirst()
  - addLast()
  - addAtPos()
  - deleteFirst()
  - deleteLast()
  - deleteAsPos()
  - deleteAll()

Linked List

- There four types of linked list.
  - ✔ Singly linear linked list
  - ✔ Singly circular linked list
  - ✔ Doubly linear linked list
  - ✔ Doubly circular linked list



Singly Linear Linked List – display()




```
void display() {
    trav = head;
    while( trav != null) {
        print(trav.data);
        trav = trav.next;
    }
}
```

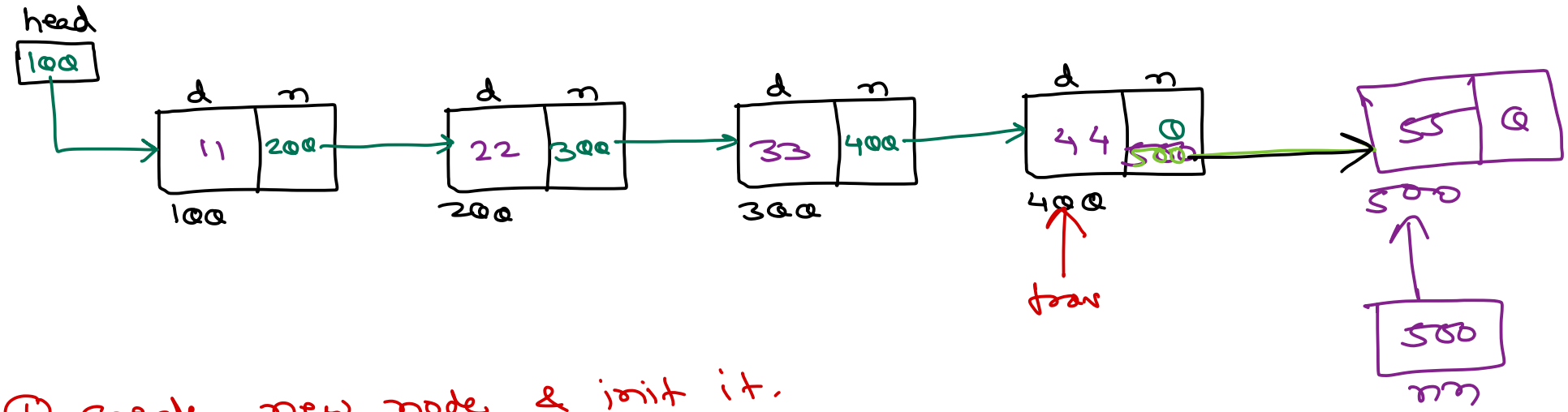
11 22 33 44


```
class SinglyList {
    static class Node {
        int data;
        Node next;
        // ctor
    }
    Node head;
    // ctor.
    void addFirst(val) {-}
    void addLast(val) {-}
    ...
}
```

next: self referential class

head: keep addr of 1st node.

Singly Linear Linked List - addLast()



① create new node & init it.

```
Node nn = new Node (val);
```

② traverse till last node.

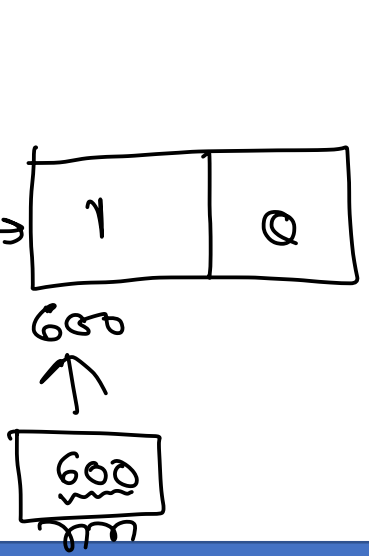
```
trav = head;
while(trav.next != null)
    trav = trav.next;
```

③ last node's next to new node

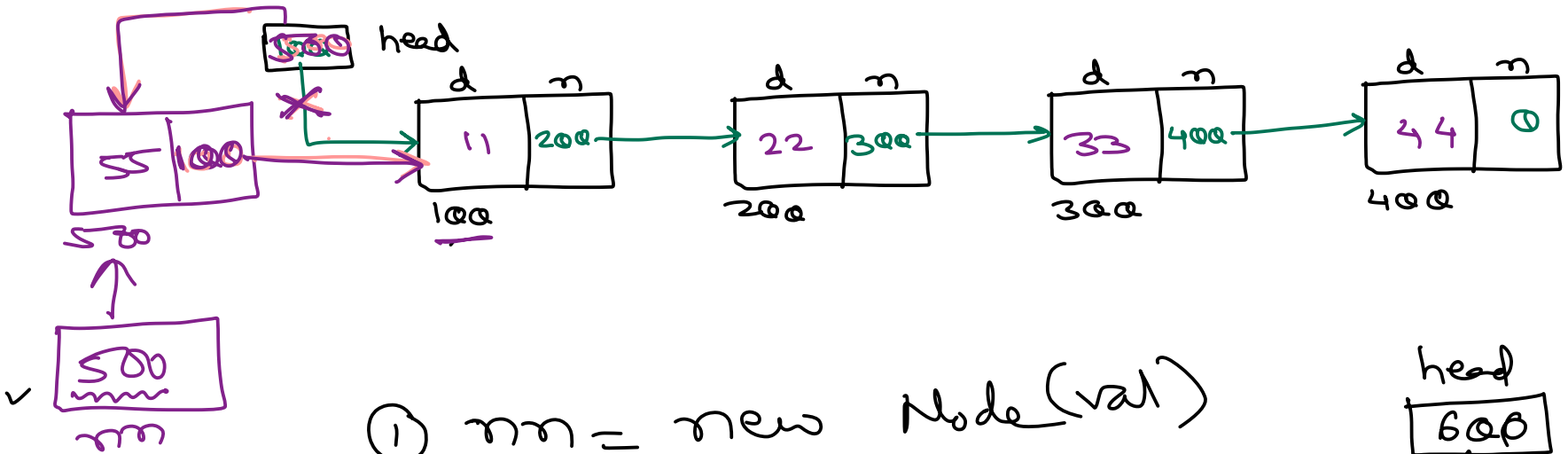
```
trav.next = nn;
```

if list is empty, make nn as first node.

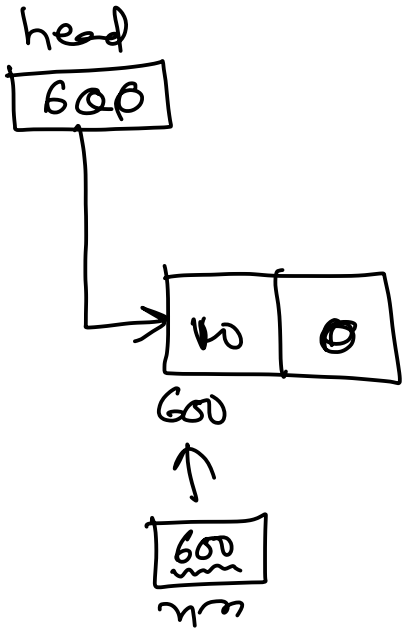
```
if(head == null)
    head = nn;
```



Singly Linear Linked List -addFirst()



1. `nn = new Node(val)`
2. `nn.next = head;`
3. `head = nn;`



Thank you!

Nilesh Ghule <nilesh@sunbeaminfo.com>