

## Summary

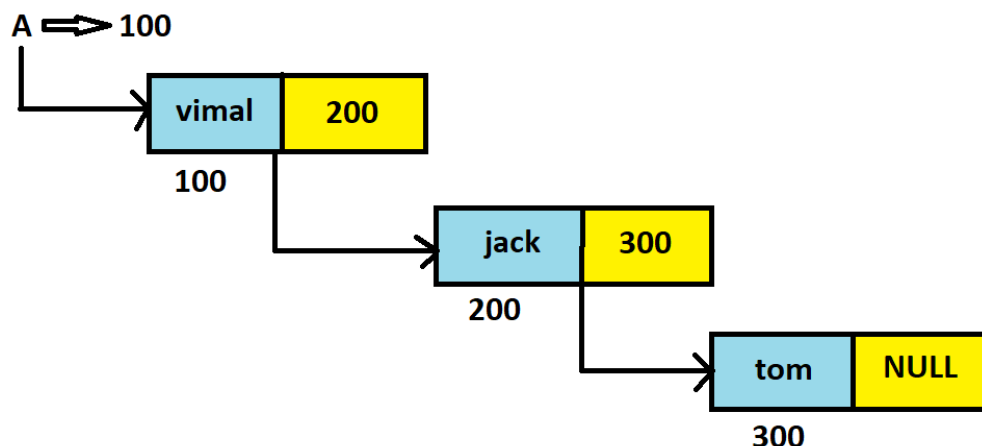
### Sessions (18-01-2023)

- If we talk about limitation of array then array take space from memory in **continuous way** and if we have data size of 2 GB and we have total 5 GB is remaining in memory and we want data will store using array but in that memory we don't have continuous space of 2 GB therefore they will show error as **OutOfMemory** exception.
- If we want to implement any data structure then we have only two way for storing data in memory ie. continuous way and non-continuous way.
  - 1) **Continuous way** : Array
  - 2) **Non-continuous way** : Linked List

- **Linked List :**

In this data structure, elements are not stored at continuous memory locations.

In an array we only need to know the first element address but in Linked List data is not stored in a continuous way therefore we need to know all elements address. Instead of create multiple pointer for storing address of multiple data, we can create some way like this,



We create a box in which we will store data and address of the next element and that box is known as **Node**. Elements are linked using the above method.

- In C++ if we want to create a node then we can create using a class.

```
// self referecing class
class Node {
    public:
        int data;
        Node *next;
};
```

- Example :

```
main() {
    Node *p = new Node; // create first Node
    cout << "addr of first node => " << p << endl;
    p -> data = 10; // store data to first node
    cout << "data of first node => " << p -> data << endl; // print data which we have in first node
    p -> next = new Node; // create second node
    cout << "addr of sec node => " << p -> next << endl; // print addr which we have in first node
    p -> next -> data = 20; // store data to sec node
    cout << "data of sec node => " << p -> next -> data << endl; // print data which we have in sec node
    p -> next -> next = new Node; // create third node
    cout << "addr of third node => " << p -> next -> next << endl;
    // print addr which we have in sec node
}
```