Wednesday, 05 October 2016

Launchpad

Lecture -14

Data Structures -1

Linked Lists

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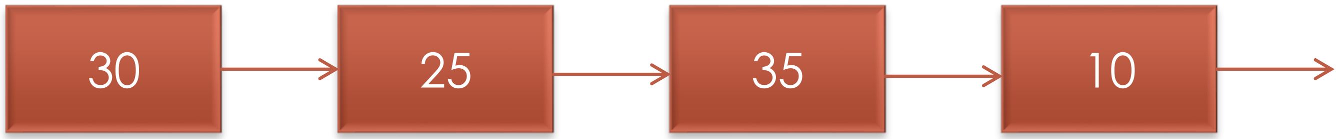
CODING BLOCKS

What are Data Structures?

CODING BLOCKS

What are Linked Lists?



CODING BLOCKS

Lets define our own Linked List

```
class Node {
        int data;
        Node* next;
}
```

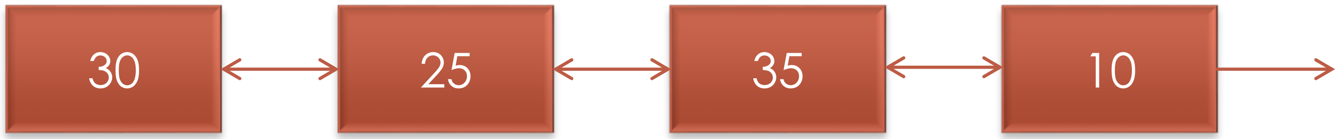
Head and Tail nodes

CODING BLOCKS

Basic operations over Linked List

1. Taking Linked List as input from user
2. Accessing next element
3. Looping over Linked List
4. Inserting into Linked List
5. Deleting from Linked List

Doubly Linked Lists



Implementation?

```
class Node {
        int data;
        Node* next;
        Node* prev;
}
```

Doubly LL vs Singly LL

1. Faster to go back in the linked list
2. Uses more memory

CODING BLOCKS

Lets try some problems

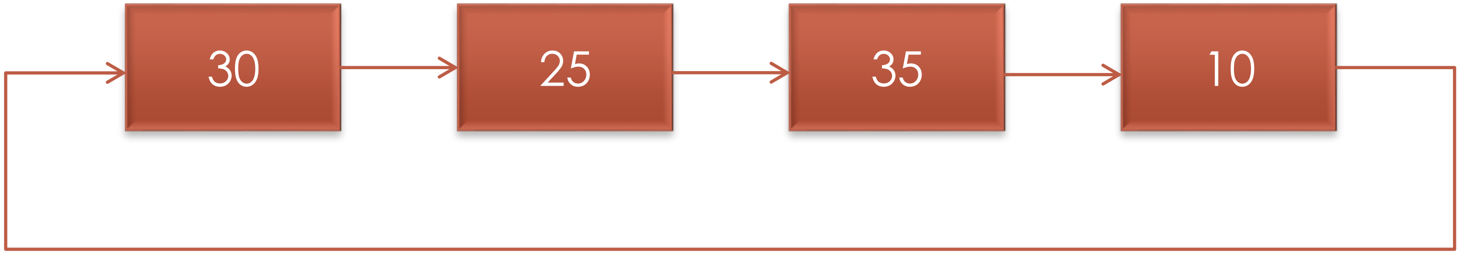
- Find length of a linked list
- Find an element recursively
- Find mid point of a linked list
- Implement Bubble Sort

Lets try some problems

- Find 5th element from end without calculating length of Linked List
- Given two sorted linked lists merge them into a sorted linked list
- Implement merge sort
- Reverse a Linked List

CODING BLOCKS

Circular Linked Lists



CODING BLOCKS

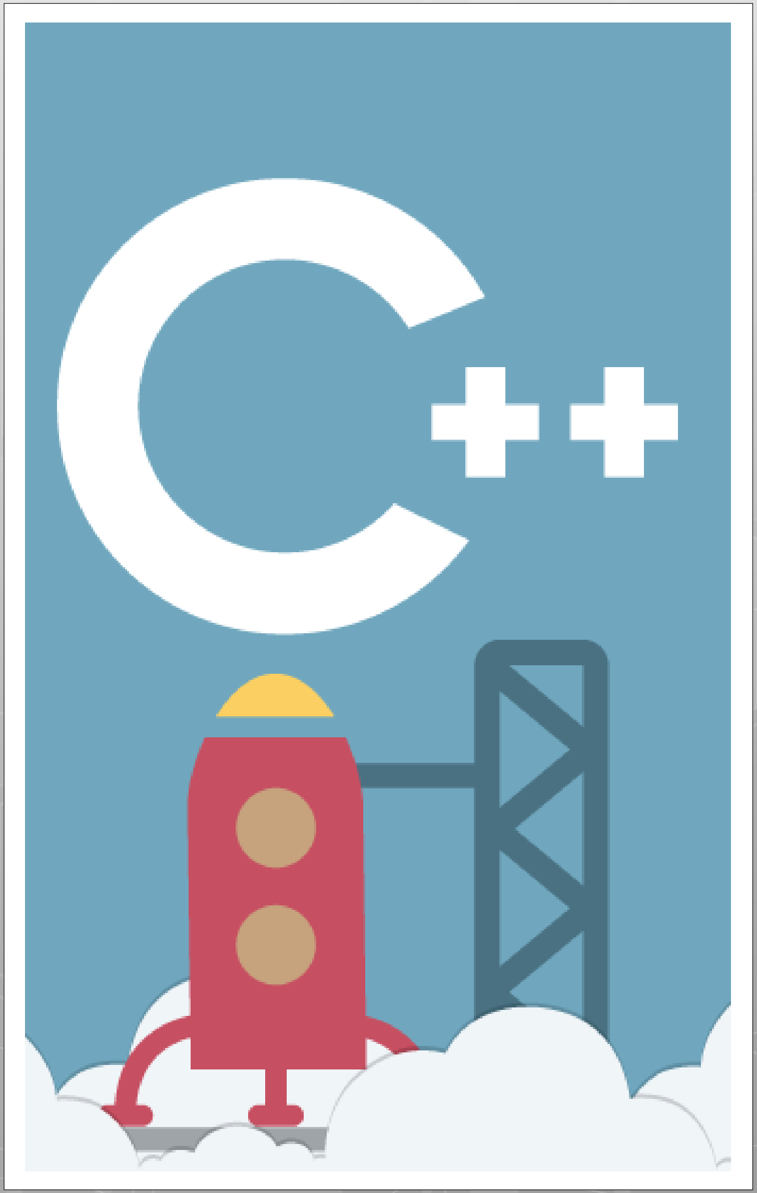
Benefits of Arrays over Linked List

1. Random access to elements
2. Fast iteration through the elements
3. Very compact way to store data

Benefits of Linked List over Array

1. Constant time insertion and deletion of elements
2. Don’t need to know the number of elements
3. Insert elements in the middle of the list

CODING BLOCKS



Thank You!

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