

Structures + classes : how to make our
our datatypes.

Example: say you wanted a datatype for
books :

```
struct book {  
    string title;  
    string author;  
    size_t num_pages;  
};
```

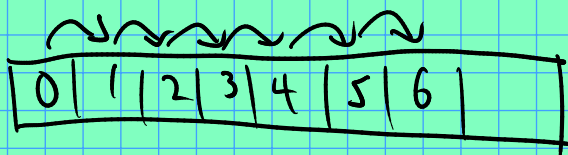
```
int main()  
{
```

```
    book b;  
    b.title = "Algebra";  
    b.author = "I. N. Herstein";  
    b.num_pages = 342;  
};
```

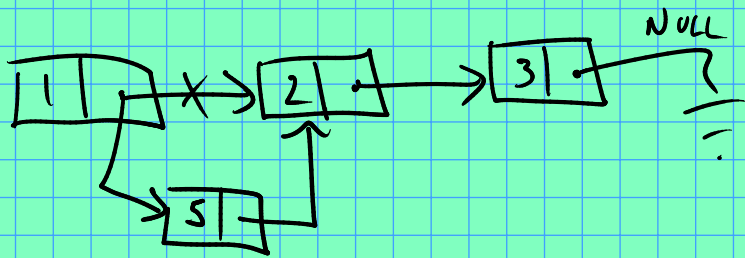
Note / aside :
Only difference between
"struct" and "class" is
that the members default
to public in structs.

New topic: lists.

Motivation: want to be able to insert
values anywhere in constant time.

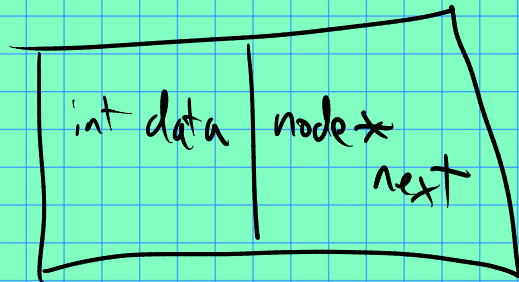


if array / vector has n elements, adding
to the front takes $\approx n$ steps.



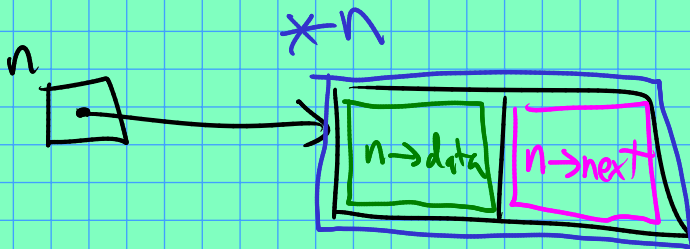
Data type for nodes:

```
struct node {
    int data;
    node* next;
};
```



code to dynamically allocate a node:

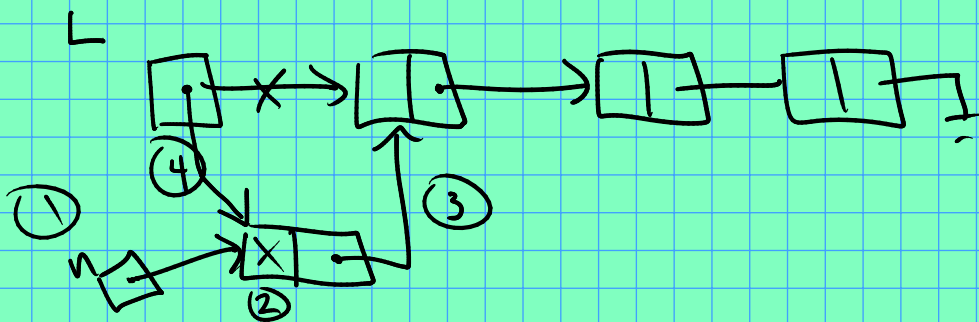
`node* n = new node;`



$\rightarrow \equiv$ "dereference, then dot"

$(*n).data \equiv n \rightarrow data$

Exercise: store all integers given on std in in a list.



node * n = new node; // ①

n → data = x; // ②

n → next = L; // ③

L = n; // ④