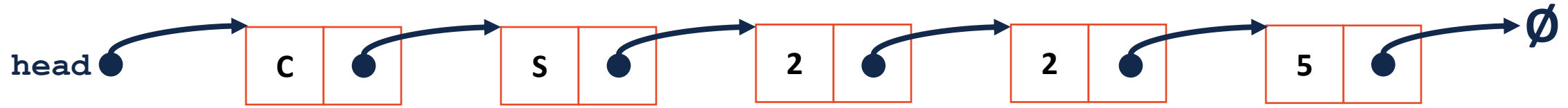# CS 225

Data Structures

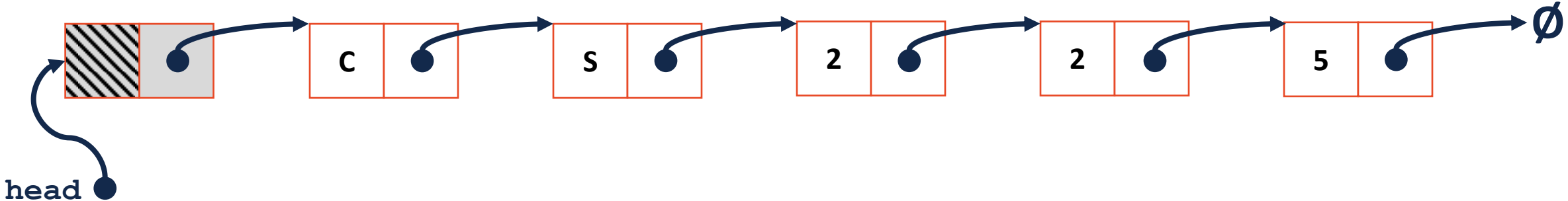*Sept. 20 – Linked Memory*

```cpp
1  #include "List.h"
2
3  ListNode *& List::_find(unsigned index) const {
4
5
6
7
8
9
10 }
```

Linked Memory

head → **C** → **S** → **2** → **2** → **5** → Ø

Sentinel Node

```cpp
#include "List.h"

ListNode *& List::_find(unsigned index) const {
    ListNode *thru = head;
    for (unsigned i=0; i < index; i++) {
        thru = thru->next;
    }
    return thru;
}

void List::get(unsigned index) const {



}
```
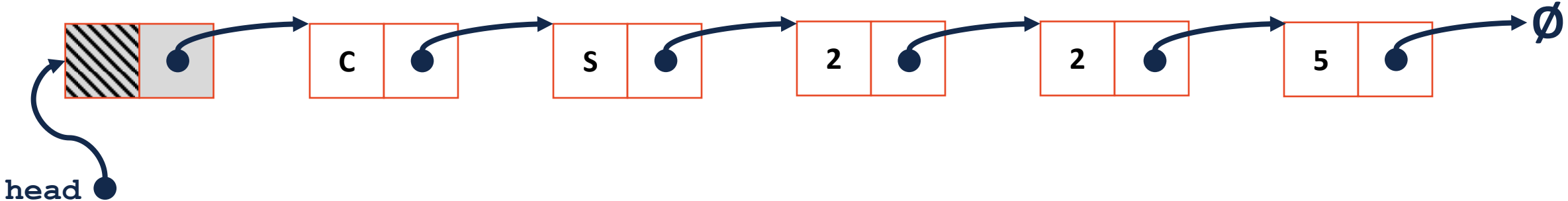
Sentinel Node
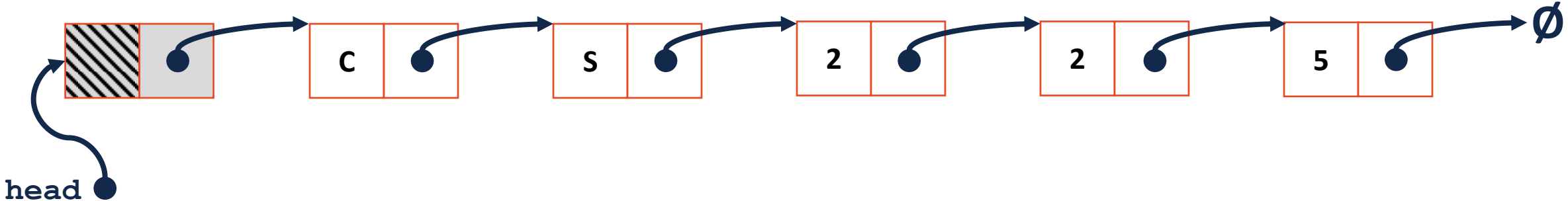
```cpp
1  #include "List.h"
2
3  ListNode *& List::_find(unsigned index) const {
4    ListNode *thru = head;
5    for (unsigned i=0; i < index; i++) {
6      thru = thru->next;
7    }
8    return thru->next;
9  }
10
11 void List::insert(T & t, unsigned index) {
12
13
14
15
16
17
18 }
```

Sentinel Node

```cpp
#include "List.h"

ListNode *& List::_find(unsigned index) const {
  ListNode *thru = head;
  for (unsigned i=0; i < index; i++) {
    thru = thru->next;
  }
  return thru;
}

void List::remove(unsigned index) {




}
```

Sentinel Node
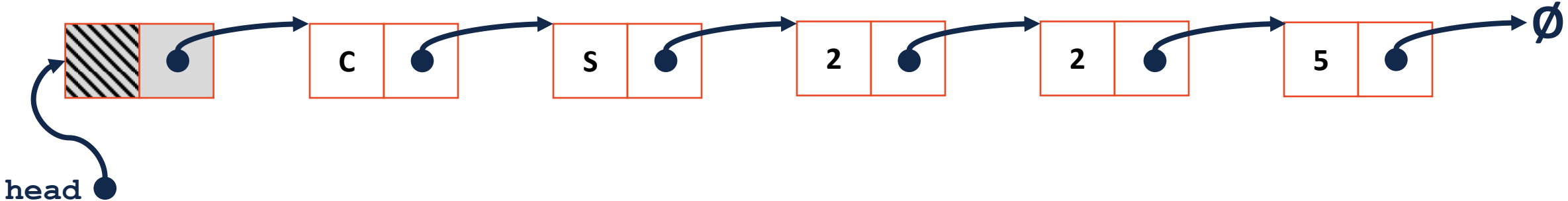
List Implementations
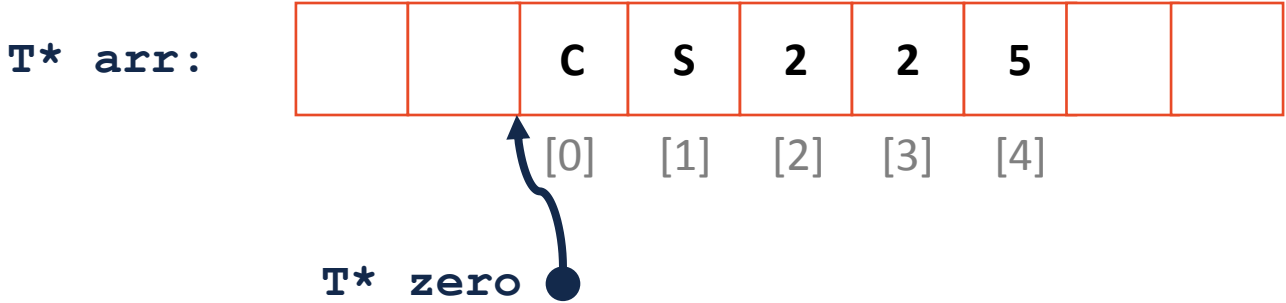
1. Linked List

2.

```
1   #ifndef LIST_H
2   #define LIST_H
3
4   template <class T>
5   class List {
6     public:
…       /* ... */
28    private:
29
30
31
32
33
34
35
36
37
38
39
40  };
41
42  #endif
```

Array Implementation

C	S	2	2	5
[0]	[1]	[2]	[3]	[4]

Array Implementation

T* arr:

		C	S	2	2	5		
		[0]	[1]	[2]	[3]	[4]		

T* zero

Array Implementation

T* arr:

		C	S	2	2	5		
		[0]	[1]	[2]	[3]	[4]		

T* zero

Array Implementation

T* arr:

		C	S	2	2	5		

[0] [1] [2] [3] [4]

T* zero
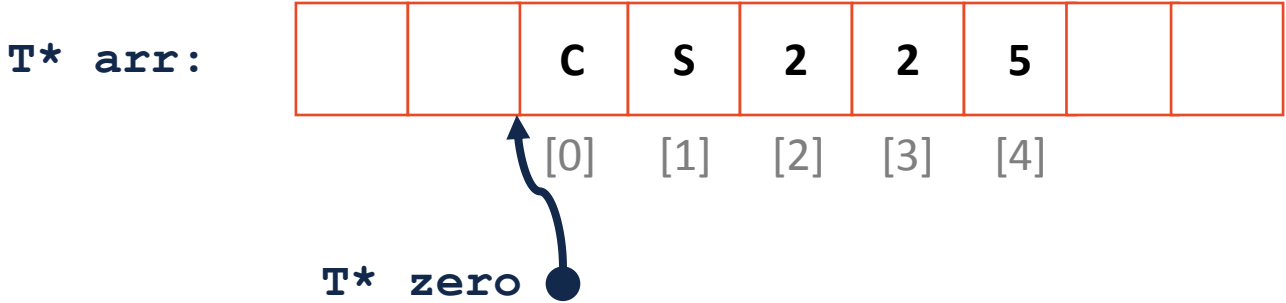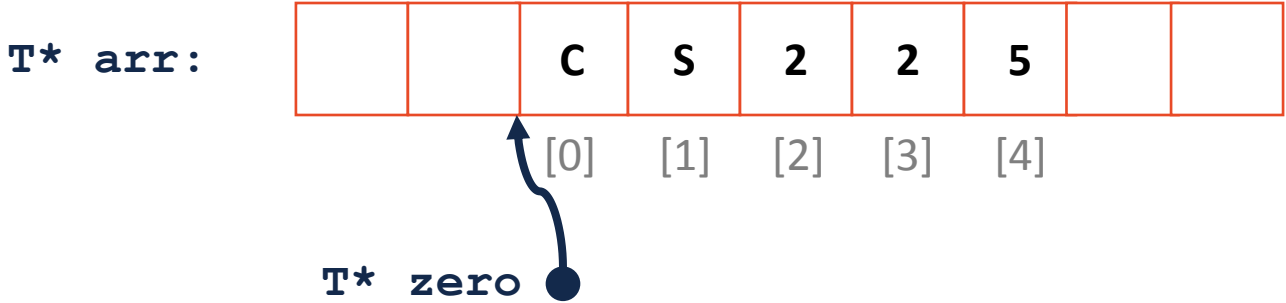
Array Implementation

	Singly Linked List	Array
Insert/Remove at **front**		
Insert at **given** location		
Remove at **given** location		
Insert at **arbitrary** location		
Remove at **arbitrary** location		

CS 225 – Things To Be Doing

Exam 2 is ongoing!

More Info: https://courses.engr.illinois.edu/cs225/fa2017/exams/

MP2: Week #2

Up to +7 Extra Credit for Early Submission

Lab: lab_gdb

One of the hardest labs of the semester, important to work with gdb

POTD

Every Monday-Friday – *Worth +1 Extra Credit /problem (up to +40 total)*