CS 225

#9: Templates and Linked Memory

February 5, 2018 · *Wade Fagen-Ulmschneider*

Abstract Data Types (ADT):

Basic functionality of a data structure

create create a list ADT

List ADT - Purpose	Function Definition
add/insert	store
remove	remove
get	access data
SIZE	HOW MUCH DATA
isEmpty	is empty

List Implementation

What types of List do we want?

Templated Functions:

functionTemplate1.cpp

```


T maximum(T a, T b) {
  T result;
  result = (a > b) ? a : b;
  return result;
}
```

Templated Classes:

List.h

```
#ifndef LIST_H
#define LIST_H


template <typename T>
class List {
  public:
    T & get(unsigned index) const;


  private:


};

#endif
```

List.cpp

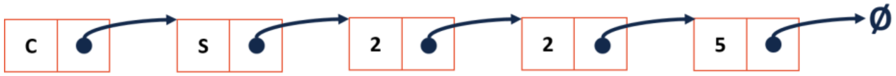
```





```

Two Basic Implementations:

1. T data

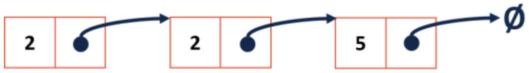
2. ListNode * next

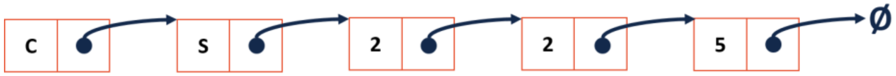
Linked Memory:



List.h

```
class ListNode {
  T & data;
  ListNode * next;
  ListNode(T & data) : data(data), next(NULL) { }
};
```





Coding with Linked Lists: Examples

List.h

```
#ifndef LIST_H
#define LIST_H

template <typename T>
class List {
  public:
     /* ... */
  private:
    class ListNode {
      T & data;
      ListNode * next;
      ListNode(T & data) : data(data), next(NULL) { }
    };






};

#endif
```

List.cpp

```
#include "List.h"

template <typename T>
void List::insertAtFront(T & t) {







}
```

List.cpp

```
void List::printReverse() const {







}
```

List.cpp

```
template <typename T>
T List::operator[](unsigned index) {





}

ListNode *& List::_index(unsigned index) {





}
```

CS 225 – Things To Be Doing:

1. Programming Exam A starts Feb. 13 (a week from tomorrow)
2. MP2 due Feb. 12 (7 days), EC deadline is tonight!
3. Lab Extra Credit → Attendance in your registered lab section!
4. Daily POTDs