Lists

Lecture 13
Section 6.1

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Outline

1 The List ADT
- Constructors
- The Destructor
- Inspectors
- Mutators
- Facilitators
- Operators
- Other Member Functions
- Non-member Operators

2 Assignment

Outline

1. The List ADT
   - Constructors
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2. Assignment

The List ADT

- A list is an ordered set of elements
$$\{a_0, \ldots, a_{n-1}\}.$$
- a_0 is at the head of the list.
- a_{n-1} is at the tail of the list.
- The size of the list is n.
- The elements a_i may be of any type, but they must all be of the same type.
- That is, the structure is homogeneous.
- A list is a generalization of an array.

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2. Assignment

List Constructors

List Constructors

```
    List();
    List(int sz);
    List(int sz, const T& value);
    List(const List& lst);
```

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2. Assignment

The List Destructor

The List Destructor

```
~List();
```

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List Inspectors

List Inspectors

```
T getElement(int pos) const;
T& getElement(int pos);
int size() const;
bool isEmpty() const;
```

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2 Assignment

List Mutators

List Mutators

```
void setElement(int pos, const T& value);
void insert(int pos, const T& value);
void remove(int pos);
void makeEmpty();
void pushFront(const T& value);
void pushBack(const T& value);
T popFront();
T popBack();
```

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List Facilitators

List Facilitators

```
void input(istream& in);
void output(ostream& out) const;
bool isEqual(const List& lst) const;
```

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2 Assignment

List Operators

List Operators

```
List& operator=(const List& lst);
T operator[](int pos) const;
T& operator[](int pos);
```

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Other Member Functions

Other Member Functions

```
void swap(List& lst);
int search(const T& value) const;
void sort();
bool isValid() const;
```

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2. Assignment

Non-member Operators

Non-member Operators

```
istream& operator>>(istream& in, List& lst);
ostream& operator<<(ostream& out, const List& lst);
bool operator==(const List& lst1, const List& lst2);
bool operator!=(const List& lst1, const List& lst2);
```

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Assignment

Homework

- Read Section 6.1, pages 253 - 257.