

Goal: Build a new web browser with visited URLs highlighted

Doesn't matter now, but fast search later

What performance do I need?

What kind of data do I have?

a Set

Customize the specific data structure that implements the interface here (can easily change later)

Write code against the interface



```
class Browser {
    URLSet visitedURLs;

    Browser () {
        this.visitedURLs = new List();
        MtBST()
    }
    ...
}
```

Where did the List class and ISet interface come from?

```
class URLSet {
    ISet theURLs;

    URLSet(ISet emptyURLs) {
        this.theURLs = emptyURLs;
    }

    boolean formatURL(String url) {
        if (this.theURLs.hasElt(url)) {
            <underline text, color purple>
        } else { <color blue> }
    }
}
```

Fundamental Abstract Datatypes in Computer Science:

- Set
- Bag
- Stack
- Queue
- Priority Queue
- ...

Each one has:

- operations
- properties
- axioms

(see class notes for example)

Different data structures provide different performance guarantees for different datatypes

creates an interface for each ADT










The Master (Java) programmer

often provides classes that implement data structures against various interfaces

Fundamental Data Structures:

- Struct
- List
- Binary Tree
- N-ary Tree
- Binary Search Tree
- AVL Tree
- Heap
- Hashtable
- ...

CS2102 is trying to teach you aspects of both of the developer and master roles!

- what are the core ADTs and Data Structures of CS? 
- how to capture ADTs in Java (interfaces) 
- how to implement data structures in Java (using classes) 
- how to select among data structures for particular problems 
- how to write code that enables switching between data structures as needed 
- how to test implementations of data structures or applications that use data structures with different properties  

If you want to major/minor in CS or IMGD-Tech, you need the basic skills of the master

If you just want some programming experience, learning to implement data structures helps build solid, widely applicable software design skills