CS 535 Object-Oriented Programming & Design
Fall Semester, 2010
Doc 9 Testing and Struct
Sept 30 2010

Slow down to go faster

Slow Down to Go Faster

If you want to move faster, you have to slow down.

3 ways to slow down to go faster

Jerod Santo
Sept 29
http://fuelyourcoding.com/slow-down-to-go-faster/

Testing

Automated test first thing dropped during time crunches

But software has to be tested

Manual testing is slow

Writing tests makes you think about problem which reduces development time

Naming Things

Only 2 hard problems in CS

- cache invalidation
- naming things
- off-by-one errors

Good names make it easier to understand code

Makes it faster to modify/maintain code

Documentation

Makes it easier to modify/maintain code

Don't write novels - be brief

Document intent not implementation

An Opposing View

Unit testing is teh suck, Urr.

Wil Shipley

http://www.wilshipley.com/blog/2005/09/unit-testing-is-teh-suck-urr.html

When modify code test it your self - try to break the code

Use people to Beta test programs

Another View

bbum

http://www.friday.com/bbum/2005/09/24/unit-testing/

Mac/iOS Core Data library

Unit testing done during development

Unit testing made library solid & stable

Wil Shipley agrees with bbum

Some things are hard to test

GUI

Network connections

Databases

Testing

What to Test

Everything that could possibly break

Test values

- Inside valid range
- Outside valid range
- On the boundary between valid/invalid

GUIs are very hard to test

- Keep GUI layer very thin
- Unit test program behind the GUI, not the GUI

Common Things Programs Handle Incorrectly

Adapted with permission from “A Short Catalog of Test Ideas” by Brian Marick

Any Object

nil pointer

Strings

Empty String

Collections

Empty Collection

Collection with one element

Collection with duplicate elements

Collections with maximum possible size

Numbers

Zero

The smallest number

Just below the smallest number

The largest number

Just above the largest number

Brian Marick paper can be found at http://www.exampler.com/testing-com/writings/short-catalog.pdf. See http://www.exampler.com/testing-com/writings.html for more of his papers.

struct -2

Some Heuristics

2.8 A class should capture one and only one key abstraction

2.9 Keep related data and behavior in one place

3.3 Beware of classes that have many accessor method defined in their public interface

Related data & operations are may not be in same place

Node Class - Just Accessor methods

Instance Variables
next
previous
data

Methods
next
next:
previous
previous:
data
data:

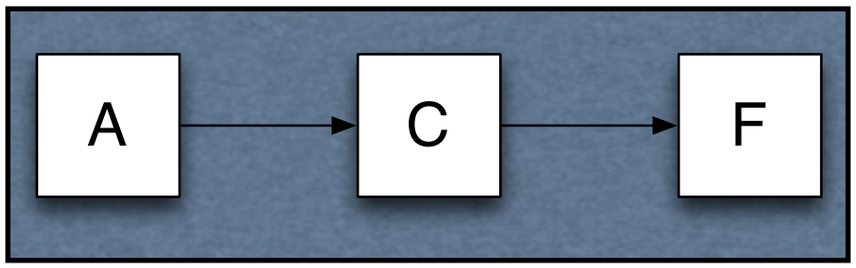
Another Test

Write 1-3 sentences describing the class

Are there any actions in the description?

If not operations and data may not be in same place

Linked List Example



Operations

- Add elements
- Test if list contains an element
- printOn:
- size

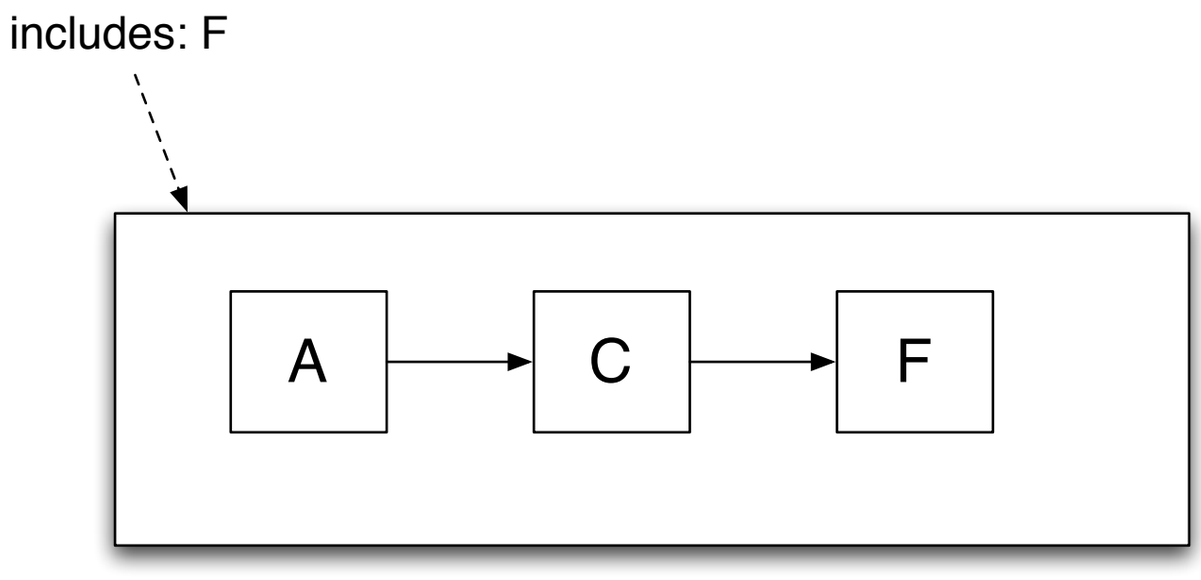
includes:

```
LinkedList>>includes: anObject
    | current |
    head isNil ifTrue: [^false];
    current := head.
    [current notNil] whileTrue: [
        current data = anObject ifTrue: [^true].
        current := current next].
    ^return false
```

includes: with Node

```
LinkedList>>includes: anObject
    head isNil ifTrue: [^false].
    ^head includes: anObject
```

```
Node>>includes: anObject
    data = anObject ifTrue: [^true].
    next ifNil: [^false].
    ^next includes: anObject
```



includes: with Node

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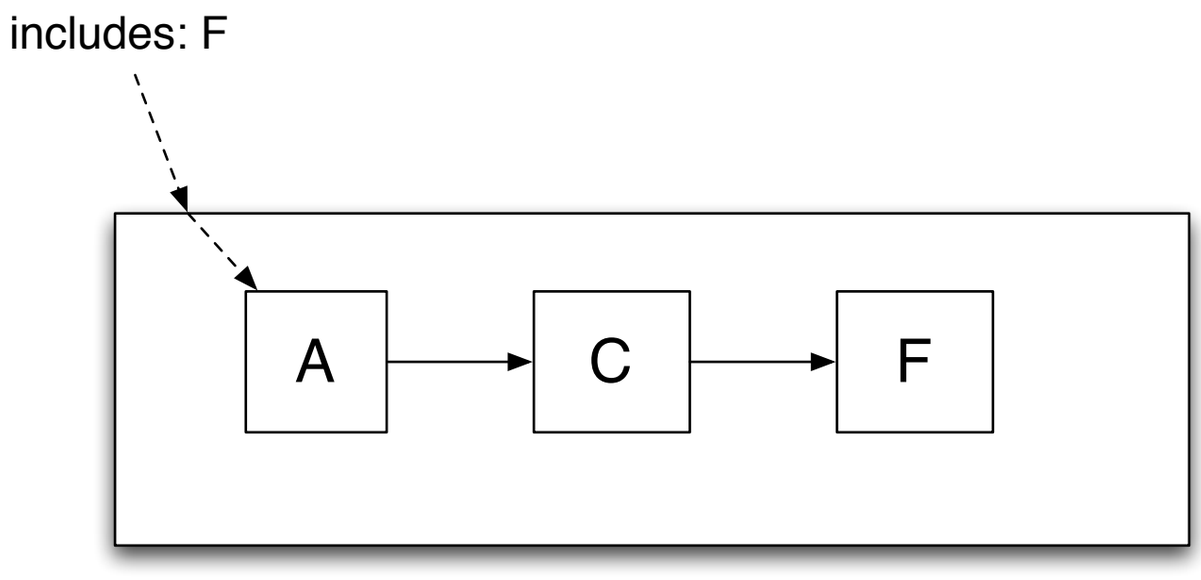
    head isNil ifTrue: [^false].
    ^head includes: anObject
```

```
Node>>includes: anObject
    data = anObject ifTrue: [^true].
    next ifNil: [^false].
    ^next includes: anObject
```



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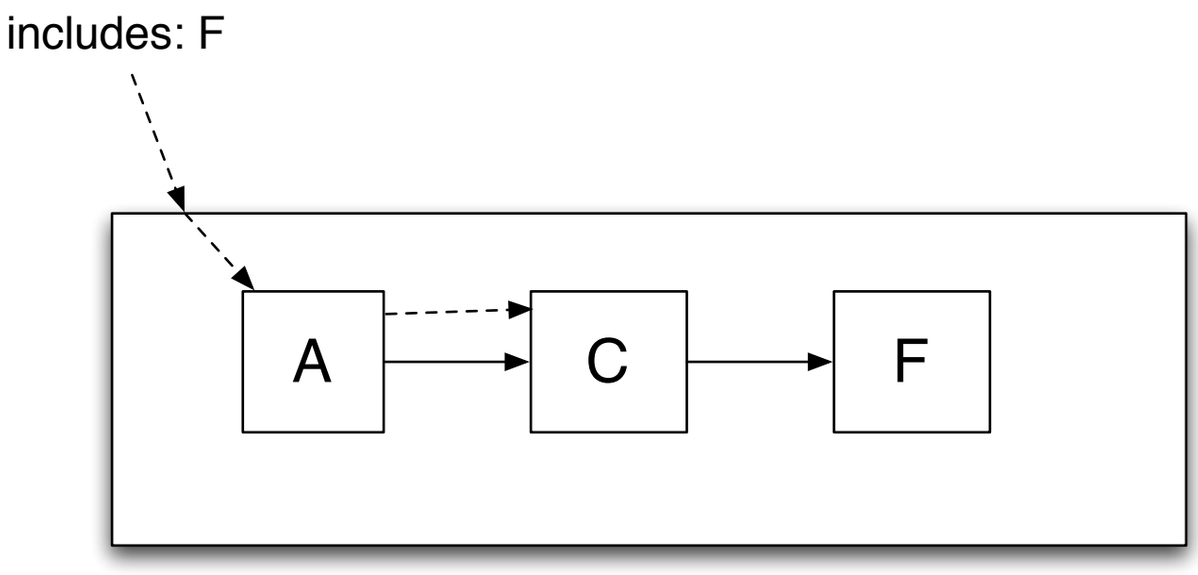

includes: with Node

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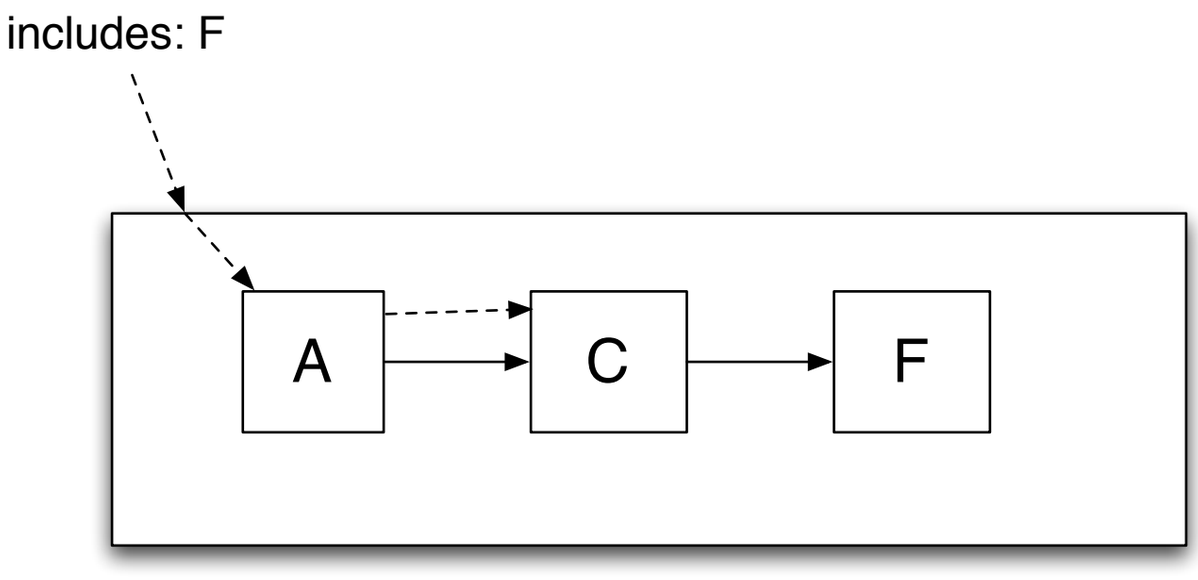
    head isNil ifTrue: [^false].
    ^head includes: anObject
```

```
Node>>includes: anObject
    data = anObject ifTrue: [^true].
    next ifNil: [^false].
    ^next includes: anObject
```



includes: with Node

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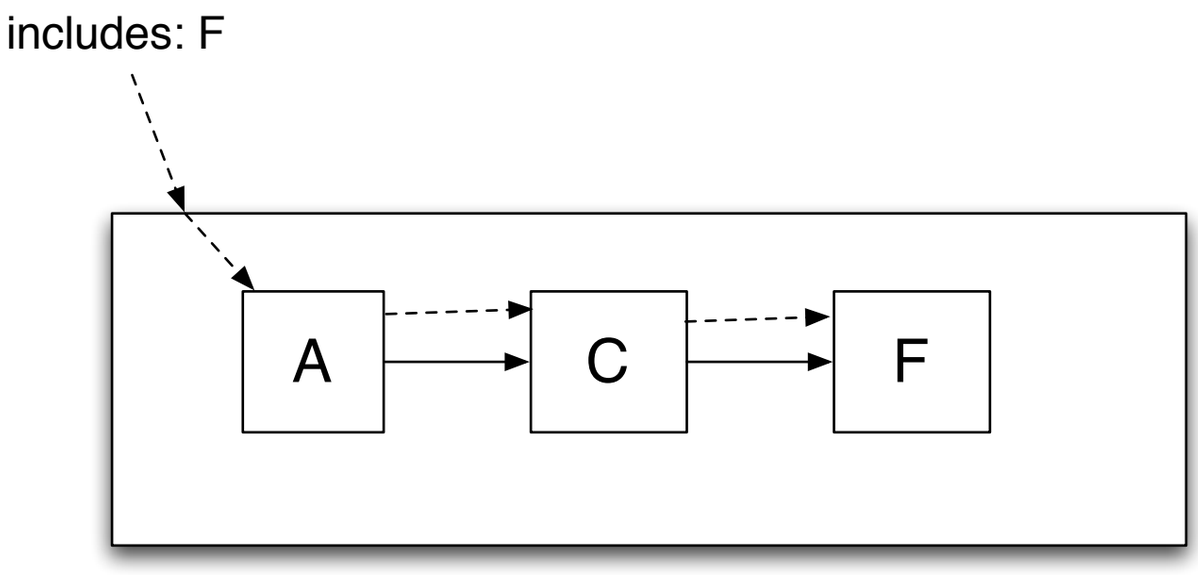
LinkedList>>includes: anObject
    head isNil ifTrue: [^false].
    ^head includes: anObject
```

```
Node>>includes: anObject
    data = anObject ifTrue: [^true].
    next ifNil: [^false].
    ^next includes: anObject
```

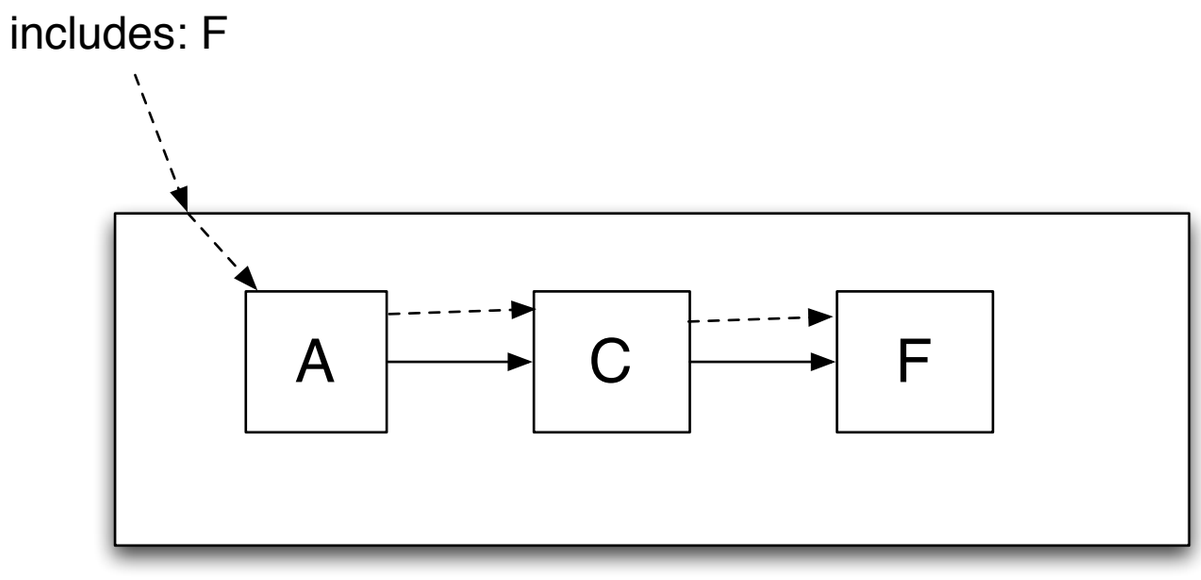


includes: with Node

```
LinkedList>>includes: anObject
    head isNil ifTrue: [^false].
    ^head includes: anObject
```

```
Node>>includes: anObject

    next ifNil: [^false].
    ^next includes: anObject
```



includes: & Nil node

```
LinkedList>>includes: anObject
    ^head includes: anObject
```

```
Node>>includes: anObject
    data = anObject ifTrue: [^true].
    ^next includes: anObject
```

```
NilNode>>includes: anObject
    ^false
```