



# TYPES OF MODELS

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Code available at: <https://github.com/pdewan/ColabTeaching>



# PRE-REQUISITES

- Model-Interactor Separation



# MODEL TYPES

Interactor

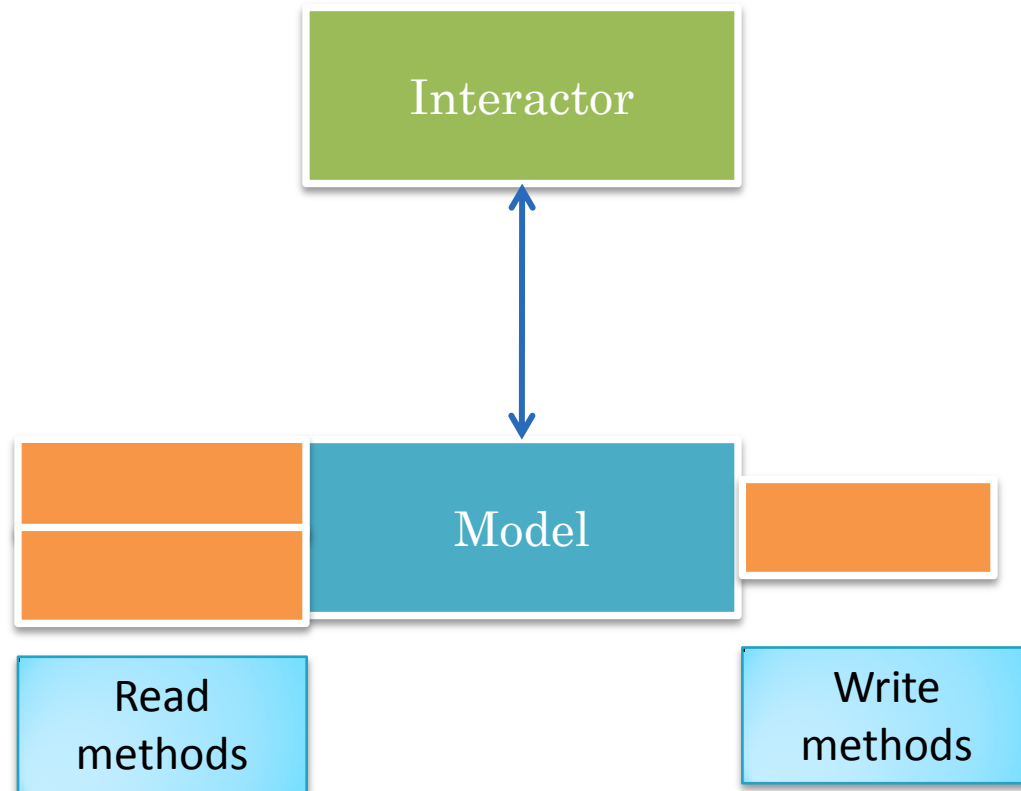


Model

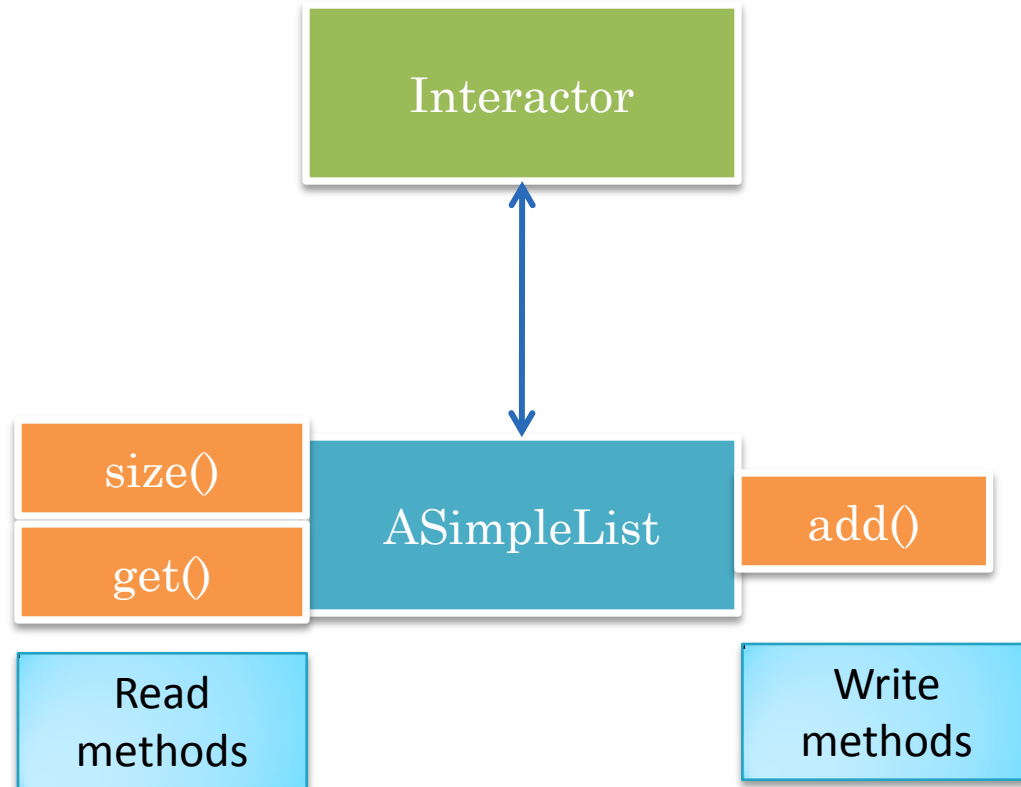
Types of models?



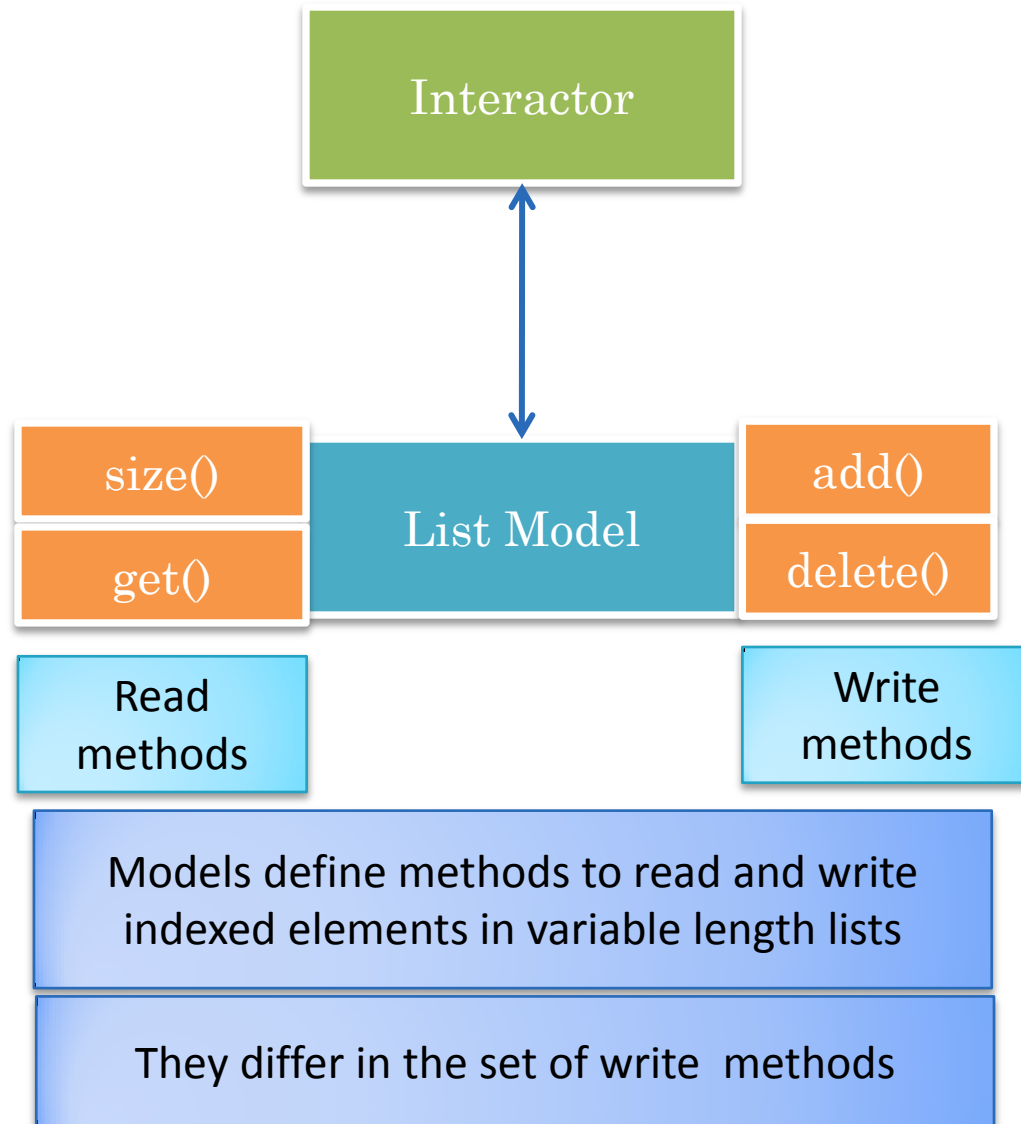
# GENERAL PATTERN



# EXAMPLE



# LIST MODELS



# LOGICAL VS. PHYSICAL STRUCTURE

```
public class ASimpleList<ElementType>
    implements SimpleList<ElementType> {
    List<ElementType> simpleList = new ArrayList();
    List<ElementType> new ArrayList();
    public void observableAdd(int anIndex, ElementType anElement) {
        add(anIndex, anElement);
        notifyAdd(anIndex, anElement);
    }
    public void notifyAdd(List<ListObserver<ElementType>> observers,
        int index, ElementType newValue) {
        for (ListObserver<ElementType> observer:observers)
            observer.elementAdded(index, newValue);
    }
    ...
}
```

ArrayList → Array?

Replacing array list with array does not change logical structure of model, which is determined by public methods



# OTHER MODELS?

The screenshot shows a window titled "[AnIMBean]" with a standard Windows-style title bar (minimize, maximize, close buttons). Inside the window, there's a tabbed interface with "Common" and "AnIMBean" tabs. The "Common" tab is active, showing a form with the following fields:

- Topic:** A text input field.
- Status:** A text input field.
- Text Area:** A large text area containing the text: "The woods are lovely dark and deep", "But I have promises to keep", and "And miles to go before I sleep".
- Aware Message:** A text input field.
- Message:** A text input field containing the text: "And miles to go before I sleep".

teractor



st Model

Other important kinds  
of models?

add()

delete()

Write  
methods

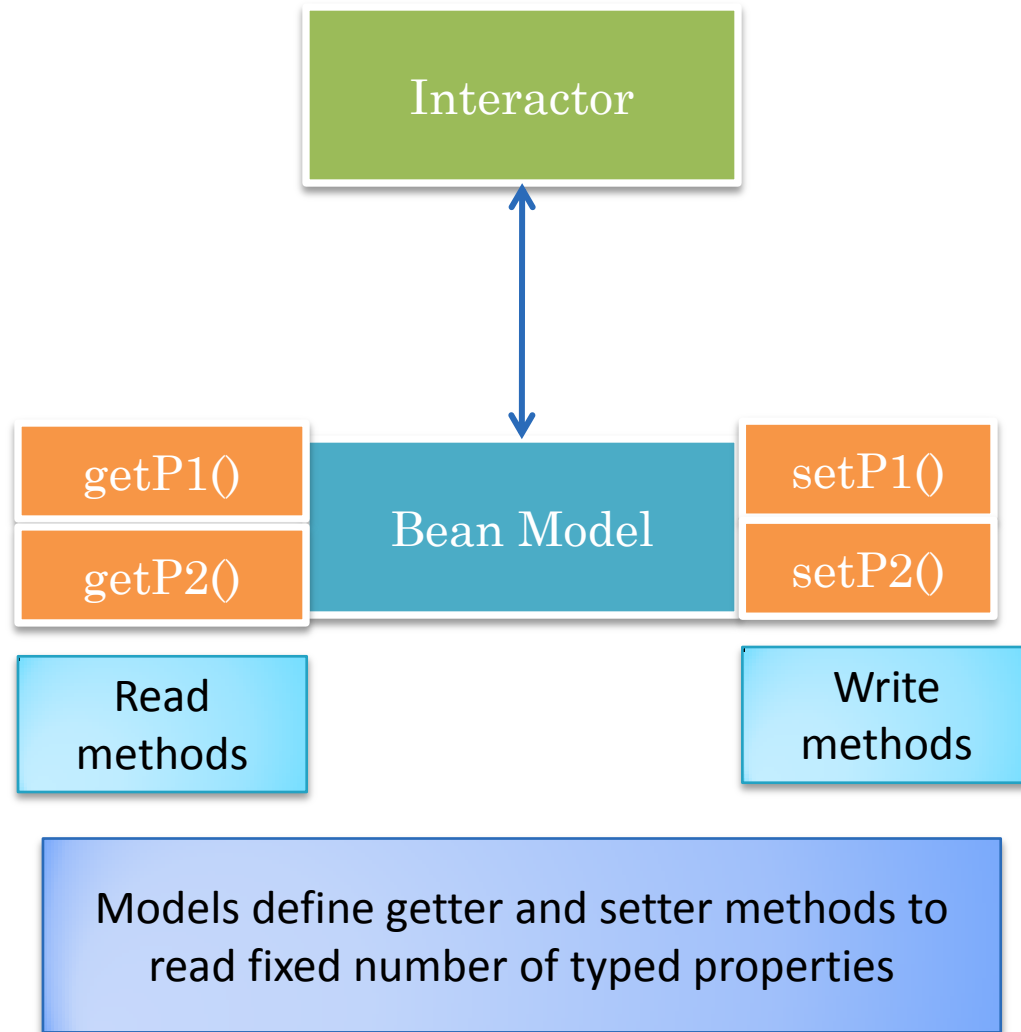
Methods to read and write  
in variable length lists

They differ in the set of write methods



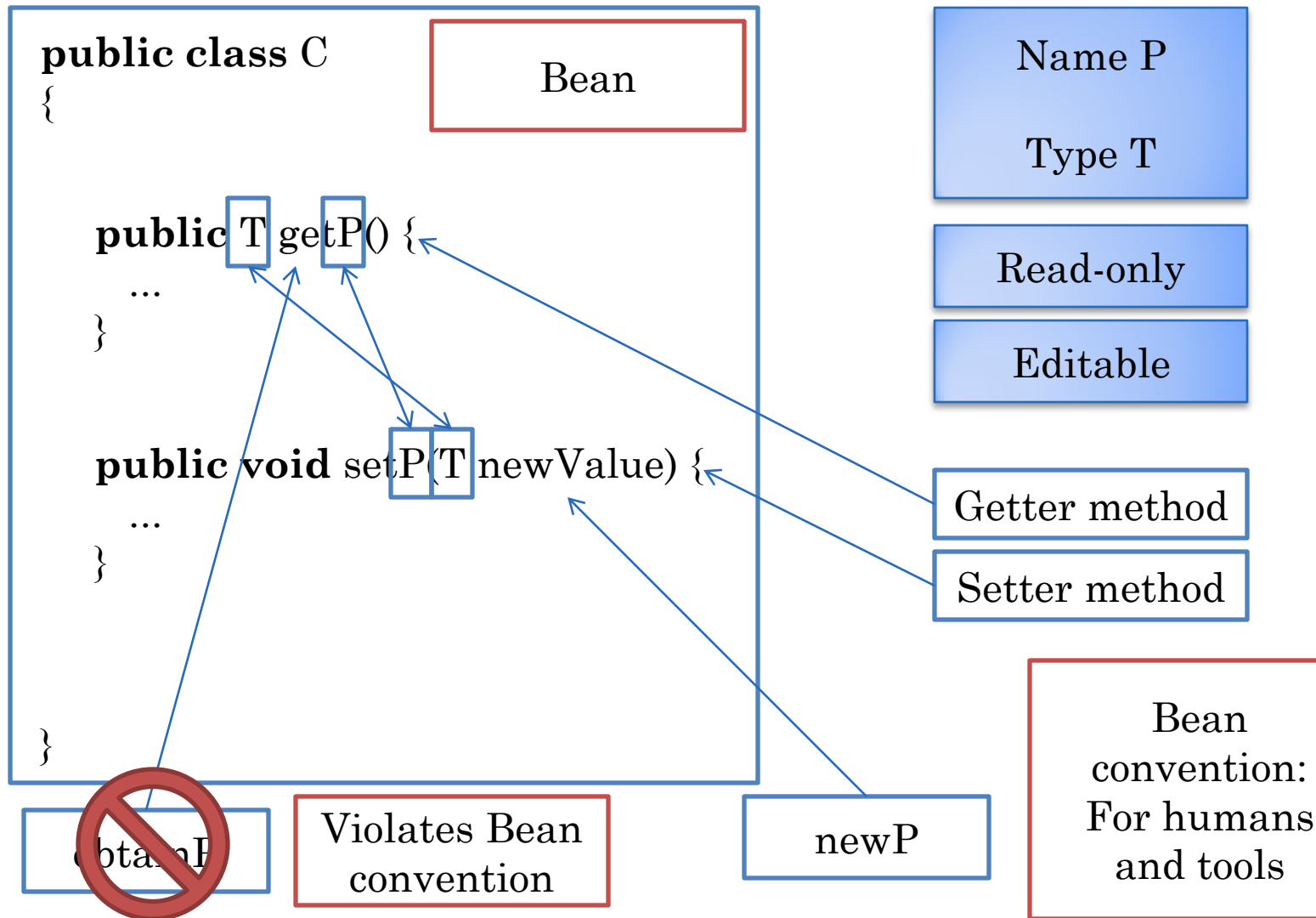


# BEAN MODELS



# READ-ONLY AND EDITABLE PROPERTIES

Typed, Named Unit of Exported Object State

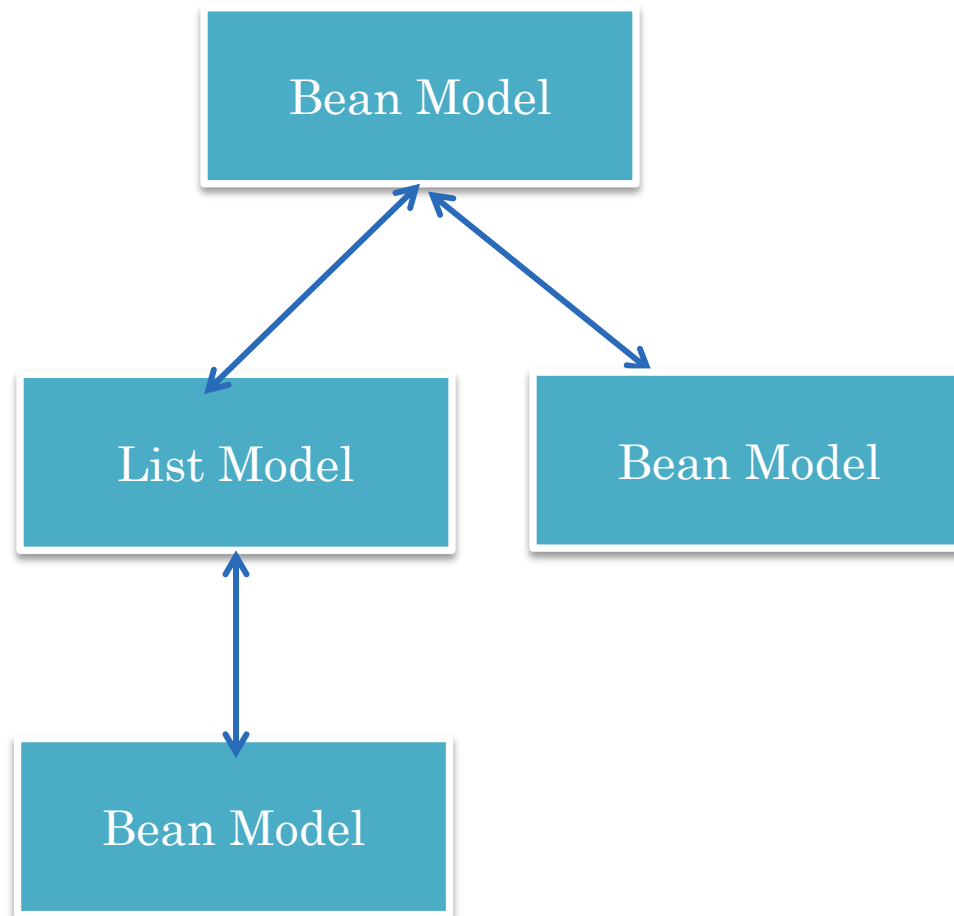


# INDEXED BEAN

Bean also defines fixed length indexed collections which we will ignore



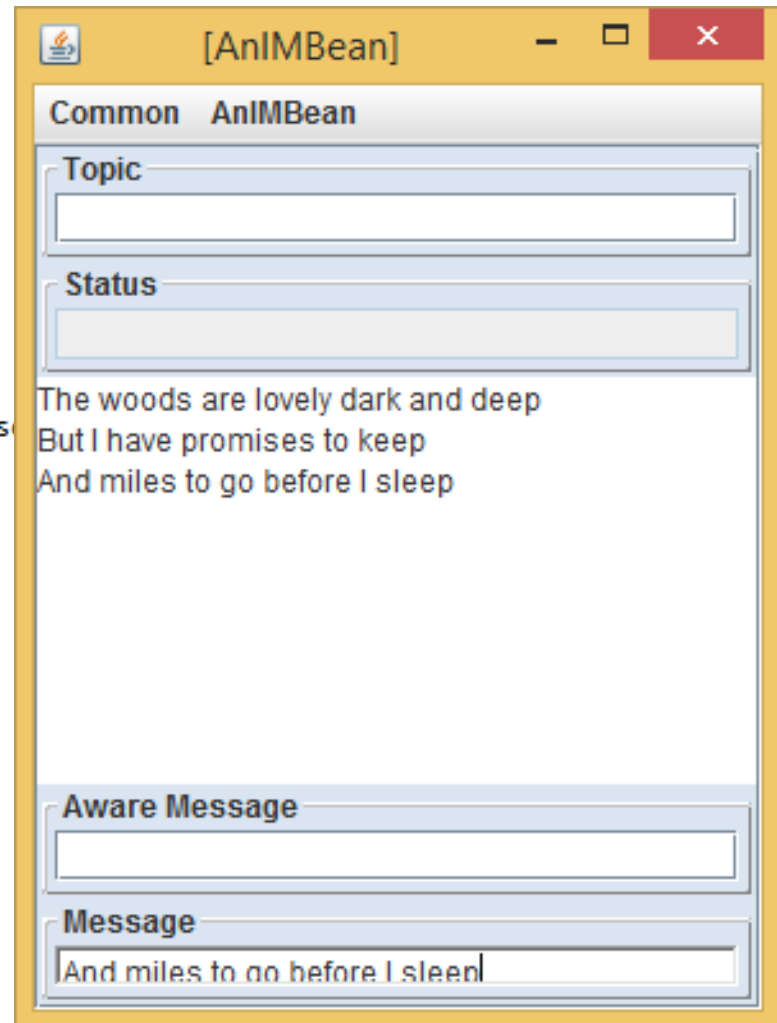
# MODEL COMPOSITION



# COMPOSING HISTORY MODEL

```
Please enter an input line or quit or history
The woods are lovely dark and deep
The woods are lovely dark and deep
Please enter an input line or quit or history
But I have promises to keep
And miles to go before I sleep
history
The woods are lovely dark and deep, But I have promis
Please enter an input line or quit or history
```

We already have a model for History

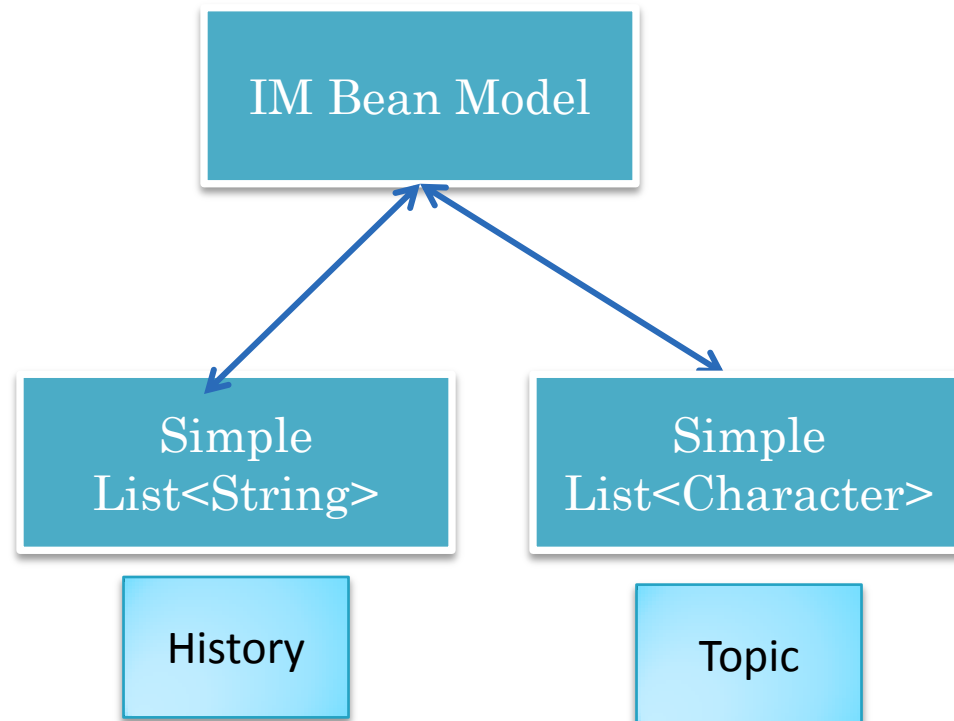


The screenshot shows a Java Swing window titled "[AnIMBean]" with standard window controls (minimize, maximize, close). The window has a tabbed interface with two tabs: "Common" and "AnIMBean". The "AnIMBean" tab is selected and contains the following components:

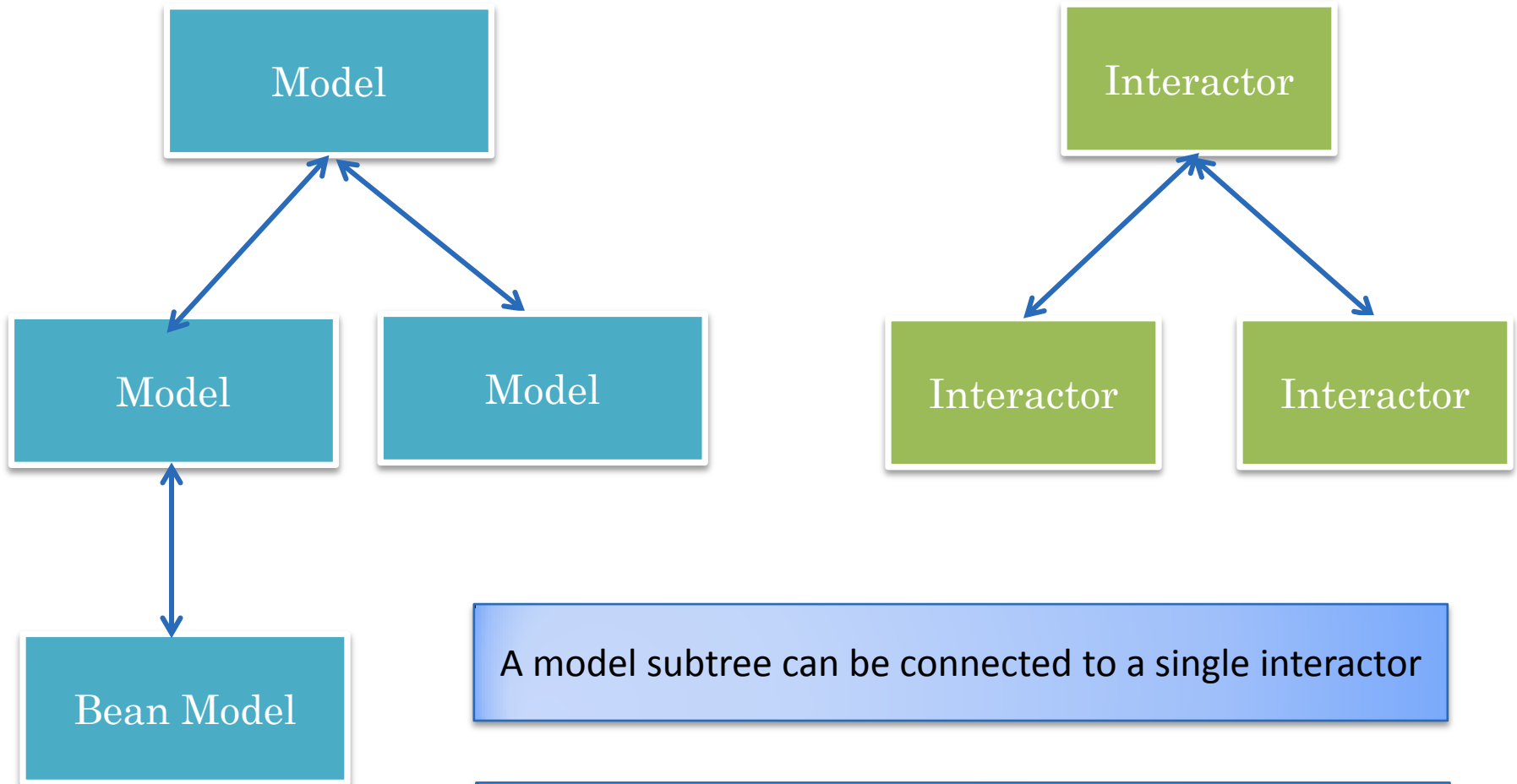
- Topic:** A text input field that is currently empty.
- Status:** A text input field containing the text "The woods are lovely dark and deep", "But I have promises to keep", and "And miles to go before I sleep" on three separate lines.
- Aware Message:** A text input field that is currently empty.
- Message:** A text input field containing the text "And miles to go before I sleep".



# EXAMPLE MODEL COMPOSITION



# CONNECTING MODEL/INTERACTOR HIERARCHIES



# SUMMARY OF MODELS

- Lists
  - Variable length indexed lists
  - Differ based on subsets of list operations exposed
- Beans
  - Property collections
  - Differ in properties
- Table model is another important kind not needed in this course
- Model composition
  - Useful when user interfaces are composed
- Model hierarchies can be connected to interactor hierarchies in arbitrary ways

