

# Collections with Iteration Order: Lists



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# Outline

Key Features

Shipment Example

List Implementations

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# Key Features

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Lists are collections with  
iteration order

```
void add(int index, E e);  
E get(int index);  
E remove(int index);  
E set(int index, E element);  
boolean addAll(int index, Collection<? extends E> c);
```

## Each element has an index

An index is an `int` representing its position in the `List`.

We can modify Lists using indices

```
int indexOf(Object o);  
Int lastIndexOf(Object o);
```

You can also lookup values by index

```
List<E> subList(int fromIndex, int toIndex);
```

Sublists are views over ranges of lists.

Modifying the view modifies the List.

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# Shipments

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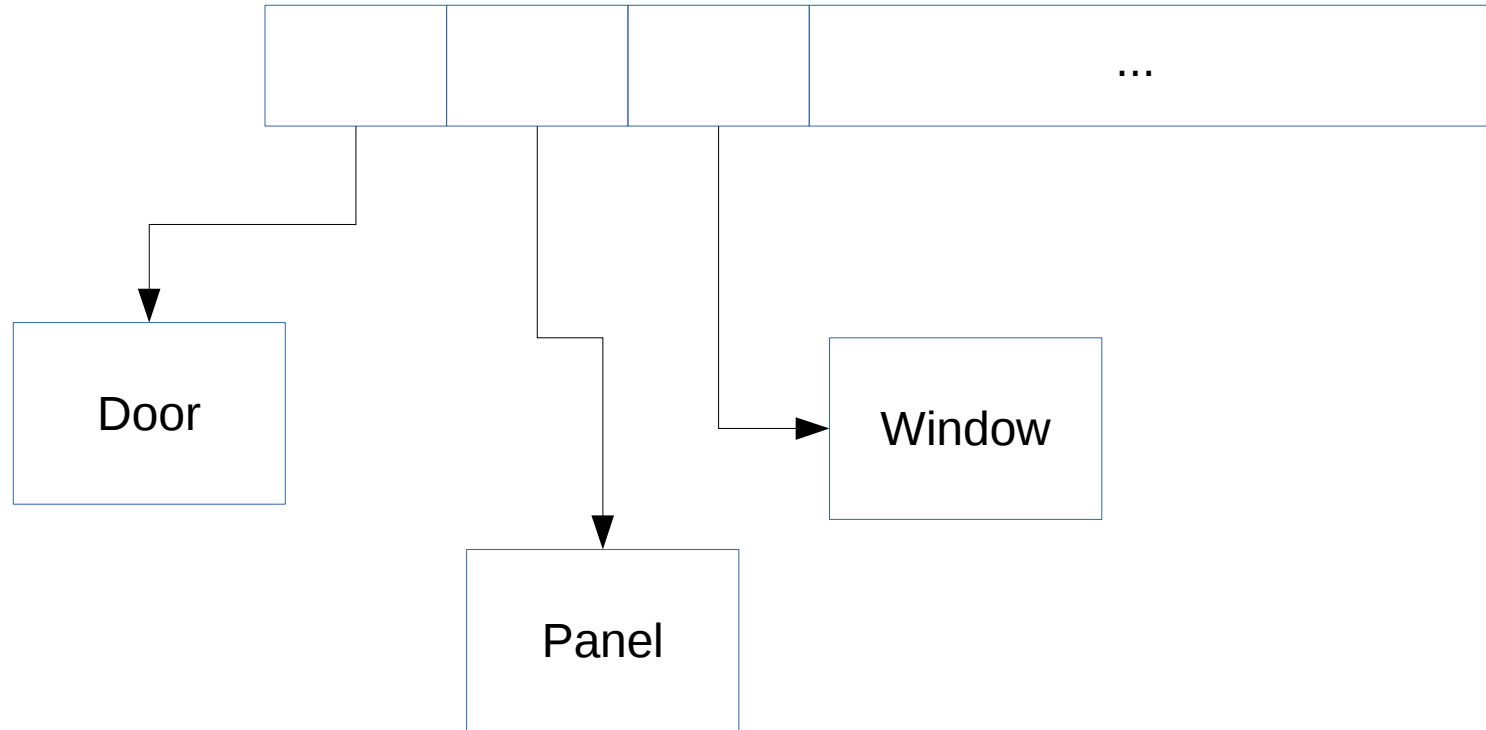


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# List Implementations

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# ArrayList



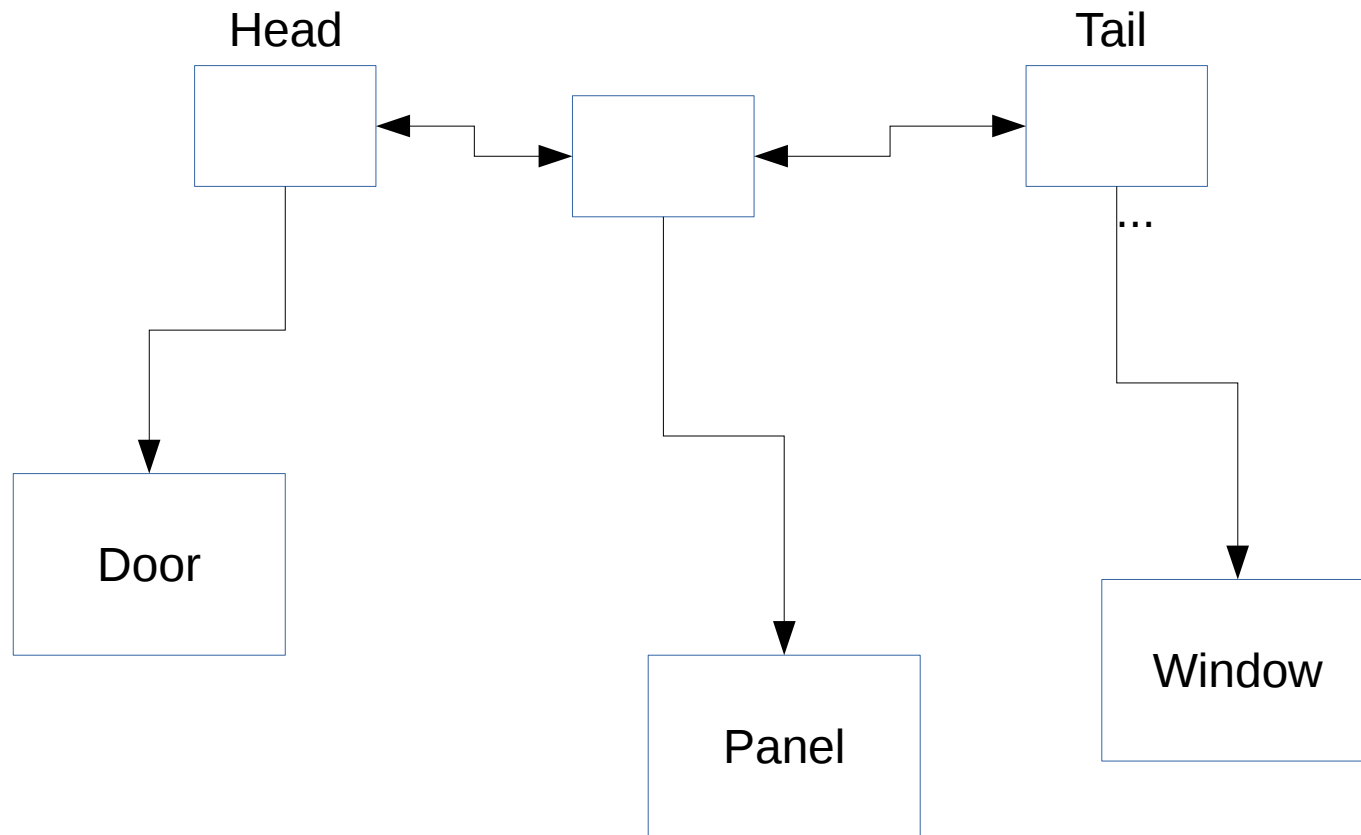
# ArrayList

Good General Purpose  
Implementation

Use as default

More CPU Cache  
sympathetic

# LinkedList



# LinkedList

Worse performance  
for many operations

Use when adding  
elements at start

Or when  
adding/removing a lot

# Performance Comparison

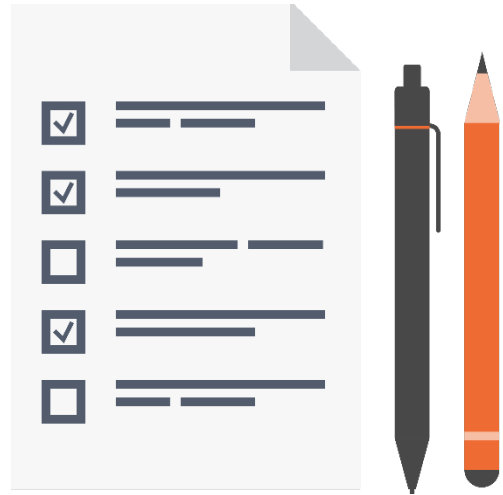
	get	add	contains	next	remove
ArrayList	$O(1)$	$O(N), \Omega(1)$	$O(N)$	$O(1)$	$O(N)$
LinkedList	$O(N)$	$O(1)$	$O(N)$	$O(1)$	$O(1)$

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# Conclusions

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# Summary



Covered the key List features

Looked at different performance tradeoffs

Lists are really commonly used





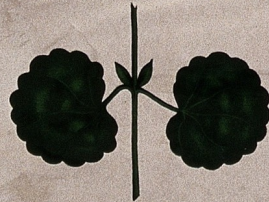
alternate, petiolate.  
abwechselnd, gestielt.  
*Prunus cerasus*  
Cherry.



alternate, sessile.  
abwechselnd, sitzend.  
*Polycnatum multifid.*  
Solomon's seal.



Decurrent  
herablaufend.  
*Symphytum officinale*



Opposite, petiolate.  
paarig, gestielt.  
*Thalictrum bednaceum*  
P.



Opposite, sessile.  
paarig, sitzend.  
*Nelachium aquaticum.*



cruciate.  
kreuzständig.  
*Tulium cruciata.*



whorled  
wirtelsständig.  
*Hyperica odorata.*



amplexicaul.  
umfassend.  
*Lamium amplexicaule.*



petiolate  
durchwachsend.  
*Ruphrum retundifol.*



verwachsen.  
*Lonicera caprifol.*