Bag implementation

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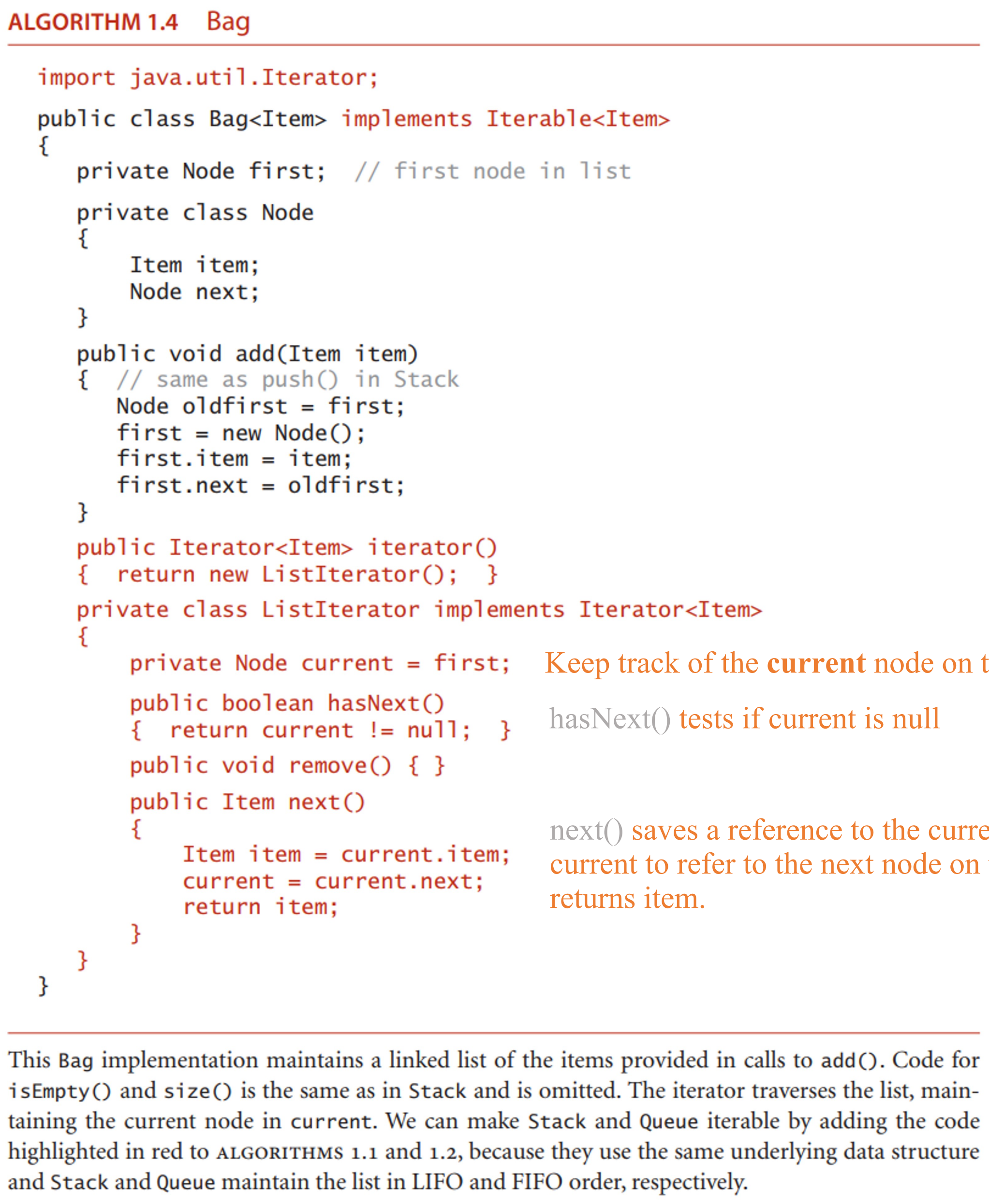

ALGORITHM 1.4 Bag

```java
import java.util.Iterator;

public class Bag<Item> implements Iterable<Item>
{
   private Node first;  // first node in list

   private class Node
   {
       Item item;
       Node next;
   }

   public void add(Item item)
   {  // same as push() in Stack
      Node oldfirst = first;
      first = new Node();
      first.item = item;
      first.next = oldfirst;
   }

   public Iterator<Item> iterator()
   {  return new ListIterator();  }

   private class ListIterator implements Iterator<Item>
   {
       private Node current = first;

       public boolean hasNext()
       {  return current != null;  }

       public void remove() { }

       public Item next()
       {
           Item item = current.item;
           current = current.next;
           return item;
       }
   }
}
```

This Bag implementation maintains a linked list of the items provided in calls to add(). Code for isEmpty() and size() is the same as in Stack and is omitted. The iterator traverses the list, maintaining the current node in current. We can make Stack and Queue iterable by adding the code highlighted in red to ALGORITHMS 1.1 and 1.2, because they use the same underlying data structure and Stack and Queue maintain the list in LIFO and FIFO order, respectively.

Keep track of the **current** node on the list

hasNext() tests if current is null

next() saves a reference to the current item, update current to refer to the next node on the list, and returns item.