

```

1 package components.queue;
2
3 import components.queue.QueueSecondary;
4 import components.sequence.Sequence;
5 import components.sequence.Sequence1L;
6
7 /**
8  * {@code Queue} represented as a {@code Sequence} of entries, with
9  * implementations of primary methods.
10 *
11 * @param <T>
12 *      type of {@code Queue} entries
13 * @correspondence this = $this.entries
14 */
15 public class Queue3<T> extends QueueSecondary<T> {
16
17     /*
18      * Private members -----
19      */
20
21     /**
22      * Entries included in {@code this}.
23      */
24     private Sequence<T> entries;
25
26     /**
27      * Creator of initial representation.
28      */
29     private void createNewRep() {
30         this.entries = new Sequence1L<T>();
31     }
32
33     /*
34      * Constructors -----
35      */
36
37     /**
38      * No-argument constructor.
39      */
40     public Queue3() {
41         this.createNewRep();
42     }
43
44     /*
45      * Standard methods removed to reduce clutter...
46      */
47
48     /*
49      * Kernel methods -----
50      */
51
52     @Override
53     public final void enqueue(T x) {
54         assert x != null : "Violation of: x is not null";
55
56         this.entries.add(this.entries.length(), x);
57     }
58 }
59

```

```
60     @Override
61     public final T dequeue() {
62         assert this.length() > 0 : "Violation of: this /= <>";
63
64         T result = this.entries.remove(0);
65
66         return result;
67     }
68
69     @Override
70     public final int length() {
71
72         int result = this.entries.length();
73
74         return result;
75     }
76
77     /*
78      * Iterator removed to reduce clutter...
79      */
80
81     /**
82      * Reports the front of {@code this}.
83      *
84      * @return the front entry of {@code this}
85      * @aliases reference returned by {@code front}
86      * @requires this /= <>
87      * @ensures <front> is prefix of this
88      */
89     @Override
90     public T front() {
91         assert this.length() > 0 : "Violation of: this /= <>";
92
93         T result = this.entries.entry(0);
94
95         return result;
96     }
97
98 }
```