

Table.java

```
1 /**
2  * Implements a non-generic hash table.
3  * Note: not full functionality or commented.
4  * @author Nick Howe, Sara Mathieson
5  * @version April 8, 2020
6  */
7 public class Table {
8
9     private TableRow[] rows; // key/value pairs
10
11     /**
12      * Constructor creates a table with
13      * the specified number of slots
14      */
15     public Table(int tableSize) {
16         rows = new TableRow[tableSize];
17     }
18
19     /**
20      * Return the default position (index)
21      * where this key is stored
22      */
23     private int hash(int key) {
24         return key % rows.length;
25     }
26
27     /**
28      * Locates the position (index) where the
29      * specified key can be found, or where it
30      * should be inserted if it is not already
31      * in the table
32      */
33     private int locate(int key) {
34         int pos = hash(key);
35
36         // this is the linear probing part
37         while (rows[pos] != null && rows[pos].key != key) {
38             pos = (pos + 1) % rows.length;
39         }
40         return pos;
41     }
42
43     /**
44      * Put the specified value in the table under the
```

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45     * specified key, returning any previous value
46     */
47     public String insert(int key, String value) {
48         int pos = locate(key);
49
50         String prev = null;
51         if (rows[pos] != null)
52             prev = rows[pos].value;
53
54         // replace or insert data
55         rows[pos] = new TableRow(key, value);
56         return prev;
57     }
58
59     /**
60     * Retrieve the value associated with the given
61     * key, or null if it doesn't exist
62     */
63     public String lookup(int key) {
64         int pos = locate(key);
65
66         String result = null;
67         if (rows[pos] != null)
68             result = rows[pos].value;
69
70         return result;
71     }
72
73     /**
74     * Class designed to hold the data
75     * in one row of the table
76     */
77     private class TableRow {
78
79         int key;
80         String value;
81
82         /** Constructor to fill in data */
83         TableRow(int key, String value) {
84             this.key = key;
85             this.value = value;
86         }
87     }
88 }
```