

```

1  import java.util.List;
2  import java.util.ArrayList;
3
4  /**
5   * The ElevensBoard class represents the board in a game of Elevens.
6   */
7  public class ElevensBoard extends Board {
8
9      /**
10     * The size (number of cards) on the board.
11     */
12     private static final int BOARD_SIZE = 9;
13
14     /**
15     * The ranks of the cards for this game to be sent to the deck.
16     */
17     private static final String[] RANKS =
18         {"ace", "2", "3", "4", "5", "6", "7", "8", "9", "10", "jack", "queen", "king"};
19
20     /**
21     * The suits of the cards for this game to be sent to the deck.
22     */
23     private static final String[] SUITS =
24         {"spades", "hearts", "diamonds", "clubs"};
25
26     /**
27     * The values of the cards for this game to be sent to the deck.
28     */
29     private static final int[] POINT_VALUES =
30         {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 0, 0, 0};
31
32     /**
33     * Creates a new ElevensBoard instance.
34     */
35     public ElevensBoard() {
36         super(BOARD_SIZE, RANKS, SUITS, POINT_VALUES);
37     }
38
39     /**
40     * Determines if the selected cards form a valid group for removal.
41     * In Elevens, the legal groups are (1) a pair of non-face cards
42     * whose values add to 11, and (2) a group of three cards consisting of
43     * a jack, a queen, and a king in some order.
44     * @param selectedCards the list of the indices of the selected cards.
45     * @return true if the selected cards form a valid group for removal;
46     *         false otherwise.
47     */
48     public boolean isLegal(List<Integer> selectedCards) {
49         /* *** TO BE IMPLEMENTED IN ACTIVITY 9 *** */
50         if (selectedCards.size() == 2)
51             return containsPairSum11(selectedCards);
52         else if (selectedCards.size() == 3)
53             return containsJQK(selectedCards);
54         return false;
55     }
56
57     /**
58     * Determine if there are any legal plays left on the board.
59     * In Elevens, there is a legal play if the board contains
60     * (1) a pair of non-face cards whose values add to 11, or (2) a group
61     * of three cards consisting of a jack, a queen, and a king in some order.
62     * @return true if there is a legal play left on the board;
63     *         false otherwise.
64     */
65     public boolean anotherPlayIsPossible() {
66         /* *** TO BE IMPLEMENTED IN ACTIVITY 9 *** */

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67         return containsPairSum11(cardIndexes()) || containsJQK(cardIndexes());
68     }
69
70     /**
71     * Check for an 11-pair in the selected cards.
72     * @param selectedCards selects a subset of this board. It is list
73     * of indexes into this board that are searched
74     * to find an 11-pair.
75     * @return true if the board entries in selectedCards
76     * contain an 11-pair; false otherwise.
77     */
78     private boolean containsPairSum11(List<Integer> selectedCards) {
79         for (int o = 0; o < selectedCards.size() - 1; o++)
80             for (int i = o + 1; i < selectedCards.size(); i++)
81                 if (bCards[selectedCards.get(o)].getPointValue() + bCards[selectedCards.get(i)].getPointValue() == 11)
82                     return true;
83         return false;
84     }
85
86     /**
87     * Check for a JQK in the selected cards.
88     * @param selectedCards selects a subset of this board. It is list
89     * of indexes into this board that are searched
90     * to find a JQK group.
91     * @return true if the board entries in selectedCards
92     * include a jack, a queen, and a king; false otherwise.
93     */
94     private boolean containsJQK(List<Integer> selectedCards) {
95         /* *** TO BE IMPLEMENTED IN ACTIVITY 7 (revised) *** */
96         for (int o = 0; o < selectedCards.size() - 1; o++)
97             for (int m = 0; m < selectedCards.size() - 1; m++)
98                 for (int i = 0; i < selectedCards.size() - 1; i++) {
99                     if (bCards[selectedCards.get(o)].getPointValue() + bCards[selectedCards.get(m)].getPointValue() + bCards[selectedCards.get(i)].getPointValue() != 0)
100                         return false;
101                     if (bCards[selectedCards.get(0)].equals(bCards[selectedCards.get(1)]) || bCards[selectedCards.get(0)].equals(bCards[selectedCards.get(2)]) || bCards[selectedCards.get(1)].equals(bCards[selectedCards.get(2)]))
102                         return false;
103                 }
104         return true;
105     }
106 }

```