

```
1 import components.simplereader.SimpleReader;
2
3 /**
4  * This program inputs an XML RSS (version 2.0) feed from a given URL and
5  * outputs various elements of the feed to the console.
6  *
7  * @author Put your name here
8  */
9 public final class RSSProcessing {
10
11     /**
12      * Private constructor so this utility class cannot be instantiated.
13      */
14     private RSSProcessing() {
15
16     }
17
18     /**
19      * Finds the first occurrence of the given tag among the children of the
20      * given {@code XMLTree} and return its index; returns -1 if not found.
21      *
22      * @param xml
23      *         the {@code XMLTree} to search
24      * @param tag
25      *         the tag to look for
26      * @return the index of the first child of the {@code XMLTree} matching the
27      *         given tag or -1 if not found
28      * @requires [the label of the root of xml is a tag]
29      * @ensures <pre>
30      * getChildElement =
31      * [the index of the first child of the {@code XMLTree} matching the
32      * given tag or -1 if not found]
33      * </pre>
34      */
35     private static int getChildElement(XMLTree xml, String tag) {
36         assert xml != null : "Violation of: xml is not null";
37         assert tag != null : "Violation of: tag is not null";
38         assert xml.isTag() : "Violation of: the label root of xml is a tag";
39
40         int i = xml.numberOfChildren();
41         int index = -1;
42
43         while (i > 0 && index < 0) {
44             i--;
45             if (xml.child(i).label().equals(tag)) {
46                 index = i;
47             }
48         }
49         return index;
50     }
51
52     /**
53      * Processes one news item and outputs the title, or the description if the
54      * title is not present, and the link (if available) with appropriate
55      * labels.
56      *
57      * @param item
```

```

63     *           the news item
64     * @param out
65     *           the output stream
66     * @requires [the label of the root of item is an <item> tag] and
67     *           out.is_open
68     * @ensures out.content = #out.content * [the title (or description) and
69     *           link]
70     */
71     private static void processItem(XMLTree item, SimpleWriter out) {
72         assert item != null : "Violation of: item is not null";
73         assert out != null : "Violation of: out is not null";
74         assert item.isTag() && item.label().equals("item") : ""
75             + "Violation of: the label root of item is an <item> tag";
76         assert out.isOpen() : "Violation of: out.is_open";
77
78         if (getChildElement(item, "title") >= 0) {
79             XMLTree title = item.child(getChildElement(item, "title"));
80             if (title.numberOfChildren() > 0) {
81                 XMLTree titleChild0 = title.child(0);
82                 out.println("Title: " + titleChild0);
83             }
84         } else if (getChildElement(item, "description") >= 0) {
85             XMLTree description = item
86                 .child(getChildElement(item, "description"));
87             if (description.numberOfChildren() > 0) {
88                 XMLTree descriptionVal = description.child(0);
89                 out.println("Description: " + descriptionVal);
90             }
91         }
92
93         if (getChildElement(item, "link") >= 0) {
94             XMLTree link = item.child(getChildElement(item, "link"));
95             XMLTree linkVal = link.child(0);
96             out.println("Link: " + linkVal);
97         }
98     }
99
100     /**
101     * Main method.
102     *
103     * @param args
104     *           the command line arguments; unused here
105     */
106     public static void main(String[] args) {
107         /*
108         * Open I/O streams.
109         */
110         SimpleReader in = new SimpleReader1L();
111         SimpleWriter out = new SimpleWriter1L();
112         /*
113         * Input the source URL.
114         */
115         out.print("Enter the URL of an RSS 2.0 news feed: ");
116         String url = in.nextLine();
117         /*
118         * Read XML input and initialize XMLTree. If input is not legal XML,
119         * this statement will fail.

```

```
120     */
121     XMLTree xml = new XMLTree1(url);
122     /*
123     * Extract <channel> element.
124     */
125     XMLTree channel = xml.child(0);
126     XMLTree title;
127     XMLTree description;
128     XMLTree link;
129
130     // title
131     int titleNum = getChildElement(channel, "title");
132     title = channel.child(titleNum);
133
134     if (title.numberOfChildren() > 0) {
135         out.println("Title: " + title.child(0).label());
136     } else {
137         out.println("Title is blank.");
138     }
139
140     //Description
141     int descriptionNum = getChildElement(channel, "description");
142
143     description = channel.child(descriptionNum);
144     if (description.numberOfChildren() > 0) {
145         out.println("Description: " + description.child(0).label());
146     } else {
147         out.println("Description is blank.");
148     }
149
150     //Link
151     int linkNum = getChildElement(channel, "link");
152
153     link = channel.child(linkNum);
154     out.println("Link: " + link.child(0).label());
155
156     /*
157     * TODO: #4 - for each item, output title (or description, if title is
158     * not available) and link (if available)
159     */
160     int itemNum = getChildElement(channel, "item");
161     if (itemNum >= 0) {
162         XMLTree item = channel.child(itemNum);
163         processItem(item, out);
164     }
165
166     /*
167     * Close I/O streams.
168     */
169     in.close();
170     out.close();
171 }
172
173 }
```