A Visual Debugger for Java in Eclipse

Joseph Masterjohn
Victor Milenkovic

Department of Computer Science
University of Miami

CSTA 2016 – San Diego
Teaching CS2 using Eclipse.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>list</td>
<td>SortedDLLPO (id=17)</td>
</tr>
<tr>
<td>head</td>
<td>DLLNode (id=20)</td>
</tr>
<tr>
<td>key</td>
<td>&quot;John&quot; (id=23)</td>
</tr>
<tr>
<td>next</td>
<td>DLLNode (id=28)</td>
</tr>
<tr>
<td>key</td>
<td>&quot;Jane&quot; (id=30)</td>
</tr>
<tr>
<td>next</td>
<td>DLLNode (id=31)</td>
</tr>
<tr>
<td>key</td>
<td>&quot;Pam&quot; (id=33)</td>
</tr>
<tr>
<td>next</td>
<td>DLLNode (id=22)</td>
</tr>
<tr>
<td>key</td>
<td>&quot;Victor&quot; (id=35)</td>
</tr>
<tr>
<td>next</td>
<td>null</td>
</tr>
<tr>
<td>previous</td>
<td>DLLNode (id=31)</td>
</tr>
<tr>
<td>value</td>
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<tr>
<td>previous</td>
<td>DLLNode (id=28)</td>
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<tr>
<td>value</td>
<td>&quot;<a href="mailto:p.maheshwari@cs.miami.edu">p.maheshwari@cs.miami.edu</a>&quot; (id=34)</td>
</tr>
<tr>
<td>previous</td>
<td>DLLNode (id=20)</td>
</tr>
<tr>
<td>value</td>
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<tr>
<td>previous</td>
<td>null</td>
</tr>
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<td>&quot;<a href="mailto:frina@cs.miami.edu">frina@cs.miami.edu</a>&quot; (id=29)</td>
</tr>
<tr>
<td>sourceName</td>
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<tr>
<td>modified</td>
<td>true</td>
</tr>
<tr>
<td>null</td>
<td>DLLNode (id=22)</td>
</tr>
</tbody>
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Teaching CS2 using Eclipse.

- Standard debugger mode in Eclipse.
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- Hard for students to debug CS2 structures,
Problem

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### Problem

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<td></td>
<td>value</td>
</tr>
<tr>
<td></td>
<td>sourceName</td>
</tr>
<tr>
<td></td>
<td>tail</td>
</tr>
</tbody>
</table>

- Standard debugger mode in Eclipse.
- Hard for students to debug CS2 structures,
- such as linked lists.
- No visual analogy.
SortedDLLPD find("Hal")

head
entry
return
false
tail

Ann
314
Bob
159
Eve
264
Jay
182
Zoe
818

Half Solution

Extensive lesson slides.
Show steps of algorithm.
Half Solution

Extensive lesson slides.

- Show steps of algorithm.
- Require considerable effort.
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Perfect "canned" example
Extensive lesson slides.

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SortedDLLPD find("Hal")

- Show steps of algorithm.
- Require considerable effort.
- Only for specific example.
- Perfect "canned" example
- doesn’t show possible bugs.
- No substitute for experience.
- Student cannot compare it with execution of assigned program.
Solution

Visual Debugger

- Displays data structures visually.
- Uses diagrams similar to textbook and lesson.
- Runs as Eclipse Plugin.
- Step by step visual update.
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Acknowledgements and Link

Supported by Tides Foundation (Google Education and University Relations Fund).

Click here to download Visual Debugger. Or cut and paste http://web.cs.miami.edu/home/jgmaster/plugin_install.txt