Path search with weight constraints

Reachability in 1-VASS with tests
Reachability in 1–VASS with tests

From \((q_1, 0)\) to \((q_2, 15)\):

\((q_1, 0); (q_2, 2); (q_2, 7); (q_4, 0); (q_3, 2); (q_2, 5); (q_2, 10); (q_2, 15)\)
Path length can be exponential

\[ s \xrightarrow{-2^n} t \]
Exponential reduction

(t, 0) reachable from (s, 0)

(t|0, 0) reachable from (s|0, 0)

(Jerome’s idea)
# Reachability in VASS with tests

## 1-VASS

<table>
<thead>
<tr>
<th></th>
<th>Without tests</th>
<th>With = tests</th>
<th>With = &amp; ≠</th>
<th>with ≤ &amp; ≥</th>
<th>2-VASS without tests</th>
<th>2-VASS with = tests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NP-complete</strong></td>
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<td>?</td>
<td>PSPACE-complete</td>
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<td>undecidable</td>
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</tbody>
</table>
My contribution (ongoing work)

Reachability in 1-VASS with equality and disequality tests when all disequality tests are on the same state is NP-complete
My contribution
(single guard)
## Conclusion

### 1-VASS

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