Models and Peterson's Algorithm

This is Peterson's algorithm:

```
boolean[] enter = {false, false};   int yield = 0 || 1;
------------------------------------------------------------
          thread t0               |        thread t1
1  while (true) {                 | while (true) {                 10
2   // entry protocol             |  // entry protocol             11
3   enter[0] = true;              |  enter[1] = true;              12
4   yield = 0;                    |  yield = 1;                    13
5   await (!enter[1]              |  await (!enter[0]              14
          || yield != 0);         |         || yield != 1);
6   critical section { ... }      |  critical section { ... }      15
7   // exit protocol              |  // exit protocol              16
8   enter[0] = false;             |  enter[1] = false;             17
9  }                              | }                              18
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The successors of $\langle yield = 0, \triangleright 6, enter[0] = T, \triangleright 14, enter[1] = T\rangle$ are:

1. The t_0 successor is $\langle yield = 0, \triangleright 3, enter[0] = F, \triangleright 14, enter[1] = T\rangle$.
2. The t_0 successor is $\langle yield = 0, \triangleright 8, enter[0] = T, \triangleright 14, enter[1] = T\rangle$.
3. The t_1 successor is $\langle yield = 0, \triangleright 6, enter[0] = T, \triangleright 15, enter[1] = T\rangle$.
4. There is no t_1 successor.

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- State $\langle \mathit{yield} = 0, \triangleright 6, \mathit{enter}[0] = T, \triangleright 14, \mathit{enter}[1] = T \rangle$ does not exist.
- There is a bug in Peterson's algorithm.
- The previous slide was wrong.
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What does Peterson’s algorithm achieve?

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2. Mutual exclusion and first-come-first-served fairness
3. Mutual exclusion using busy waiting
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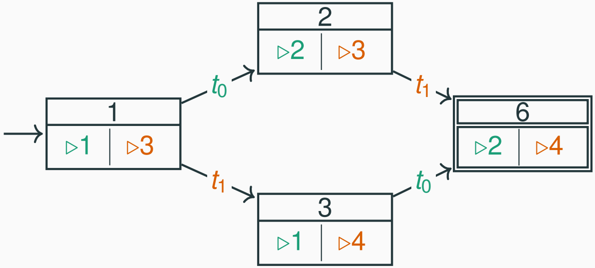
What properties does the following state/transition diagram show?



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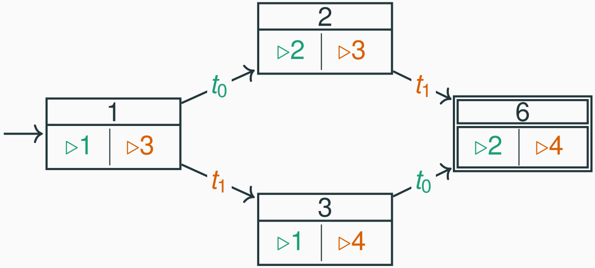

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