操作系统原理

第八章：死锁

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February 19, 2016

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Outline

The deadlock problem

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P_1	P_2
P(A);	P(B);
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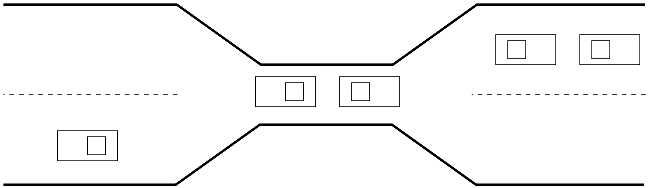

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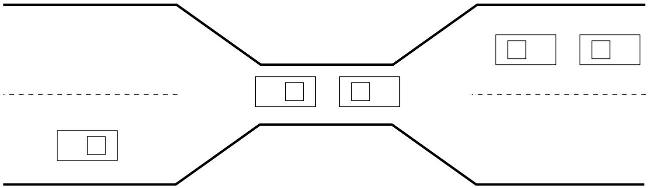

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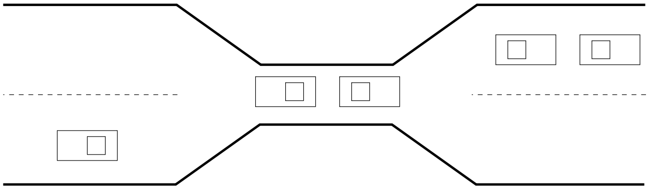

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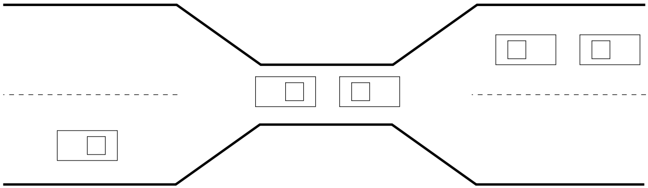

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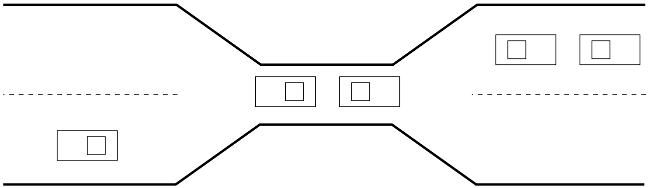

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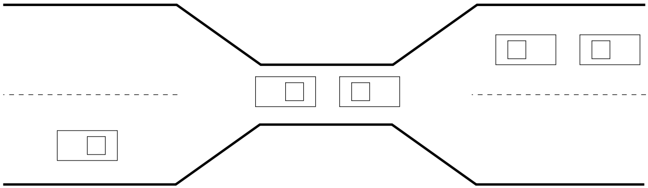

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- Starvation is possible.

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  - **No preemption** - a resource can be released only *voluntarily* by the process holding it, after that process has completed its task.
  - **Circular wait** - there exists a set $\{P_0, P_1, \ldots, P_n\}$ of waiting processes such that P_0 is waiting for a resource that is held by P_1, P_1 is waiting for a resource that is held by P_2, ..., P_{n-1} is waiting for a resource that is held by P_n, and P_n is waiting for a resource that is held by P_0.

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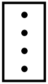

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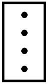

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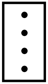

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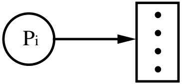

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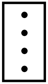

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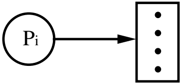

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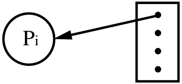

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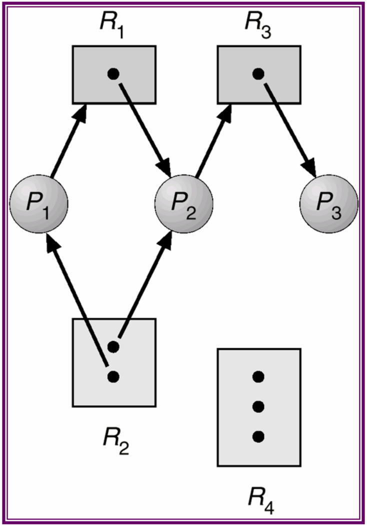

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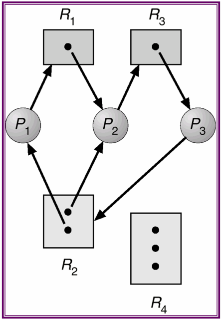

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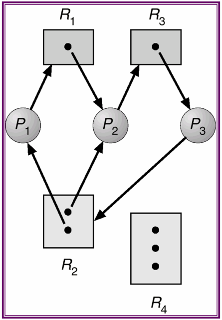

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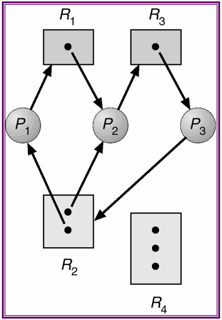

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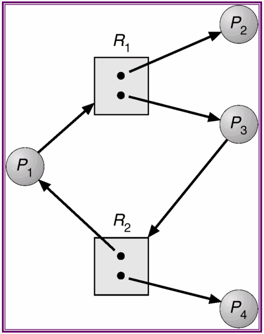

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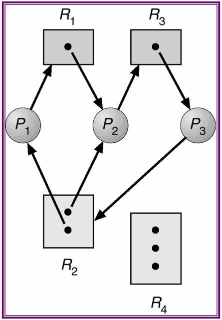

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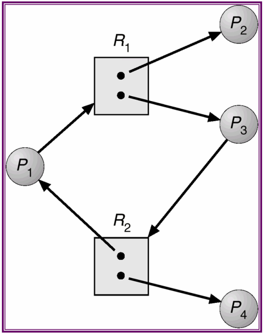

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   - Because the deadlocks occur very rarely and the deadlock-prevention, deadlock-avoidance or deadlock-detection and recovery algorithms are *costly*.
   - It's a trade-off between *convenience* and *correctness*.

Questions

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