Lecture 8: Model Checking

- Model Checking on a Super Computer
- Examples
- Explicit State Algorithm
- Model Checking Problem
Model Checking Problem

Let $W$ be the state-transition graph obtained from the concurrent system. Let $\phi$ be the specification expressed in temporal logic. Find all states $s$ of $W$ such that $\phi \models s$, i.e.,

$\phi \models s$.
Basic Model Checking Algorithm
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Mutual Exclusion Example
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Mutual Exclusion Example
Vectorized version of EMC algorithm on Fujitsu FACOM VP400E using an explicit representation of the state–transition graph.

State Machine size:
- 131,072 states
- 67,108,864 transitions
- 512 transitions from each state on the average.

CTL formula:
- 113 different subformulas.

Time for model checking:
- 225 seconds!!