Formal methods - ch 05 symbolic CTL model Checking

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1 Motivations

State space explosion: too much memory required, too much CPU time required to explore each state. Solution: symbolic representation system, we manipulate sets of states (rather than single states), expansion of sets of transitions (rather than single transitions.

2 Ordered Binary Decision Diagrams

OBDDs

1. if-then-else binary direcet acyclic graphs (DAGs)
2. Variable ordering, variable are ordered in the read.

Ordered Decision Tree From root to leaves, variables are encountered always in the same order. On this tree we apply dynamic programming style of reduction and removing redundancies we get to a point where we have a OBDD.
ite == if then else

An OBDD is a canonical representation of a boolena formula: once the variable ordering is established, equivalent formulas are represented by the same OBDD. **EQUIVALENCE CHECK REQUIRES CONSTANT TIME!**