Problems and Exercises
"Model Checking", SS06
Part 4

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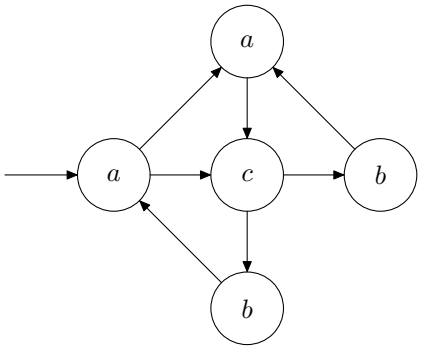
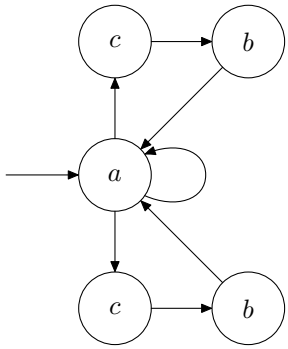
Simulation



A



B

1. Consider the structures A and B above.
   (a) Does one of the structures simulate the other ($A \preceq B$ or $B \preceq A$)? Are they bisimilar ($A \equiv B$)?
   (b) If there is no bisimulation, what is the simplest CTL* formula to distinguish both structures?
2. Find the simplest bisimilar structures for A and B and specify the bisimulation relations.
3. ***** Suppose two structures S and S' are not bisimilar. Show that there exists a formula containing only **AX** and **EX** as temporal operators that distinguishes both structures.

Abstraction

4. Create an abstract model from the C program below using the predicates $(z = 0)$ and $(x = y)$.

```
int x, y, z, w;

void foo()
{
  do {
    z = 0;
    x = y;
    if (w) {
      x++;
      z = 1;
    }
  } while (x != y);

  if (z) assert(0);  // Error
}
```