Challenge

Spare Time Teaching

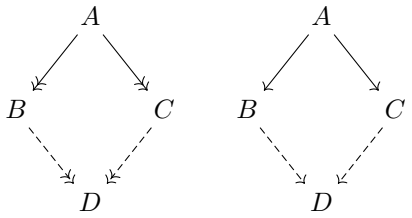
March 4, 2014

Problem

We say that a system is *Church-Rosser* (CR, also known as *confluent*) if: forall paths $A \to^* B$ and $A \to^* C$, there exists paths $B \to^* D$ and $C \to^* D$.

We say that a system has *diamond property* (DP) if: forall steps $A \to B$ and $A \to C$, there exists steps $B \to D$ and $C \to D$.

Visualized:



(a) CR (b) DP

It is clear that DP $\not\Rightarrow$ CR. But what about the other way around?

Prove CR $\Rightarrow$ DP or disprove it by constructing a lambda term that does not satisfy DP (Lambda Calculus is CR).