Bonus Assignment 1
Programming Theory

This assignment is worth 1 point and the deadline is at 18:00 23/9, 2009. Hand in your assignment on paper in Ahmed’s mailbox (number 53 in building 1, 4th floor). If you write by hand, make sure your handwriting is clear and unambiguous. If you hand in a printed solution, make your expressions are nicely formatted using a formula editor (for best results, use LATEX) - do not hand in your solution in plain text.

It is not necessary to show the steps involving application of commutativity and associativity. Any questions about the assignment should be directed to Johannes (joam1915@student.uu.se). Glhf!

Assignment 1 (25%) Using only the axioms and inference rules of section 1, prove the theorem

\[(p \lor (p \Rightarrow q)) = (q \Rightarrow p)\]

Assignment 2 (25%) Using the axioms and inference rules of section 1, as well as the derived theorems of section 2, prove the theorem

\[((p \land (p \Rightarrow q)) \Rightarrow r) \land p \land q) \Rightarrow r\]

Assignment 3 (50%) Using the axioms, inference rules and theorems of sections 1, 2, 4 and 8, prove the theorem

\[m_1 \leq m_2 \leq m_3 \Rightarrow \left( x \in b[m_1 : m_2] \lor x \in b[m_2 : m_3] \Rightarrow x \in b[m_1 : m_3] \right)\]