COMP21111 Assignment 8
20 marks

Deadline: 3rd Dec., time 12:00, SSO

Show your working.

Problem 1 (6 marks)

Evaluate the following formula using the Splitting Algorithm:

$$\exists r \forall q \exists p (p \leftrightarrow ((p \rightarrow \neg r) \leftrightarrow q)).$$

Problem 2 (7 marks) Evaluate using DPLL

Evaluate the following formula using DPLL:

$$\forall p \exists q \forall s \exists r$$
$$q \vee \neg p \vee s$$
$$\neg q \vee \neg p \vee \neg r \vee \neg s$$
$$\neg q \vee \neg p \vee r \vee \neg s$$

Problem 3 (7 marks)

Evaluate the formula below using the following algorithm.
First, build an OBDD which represents the propositional part of the formula using the order $p > q > s$. Then apply the quantification algorithm to this OBDD to obtain nodes representing quantified subformulas of this formula, including the node representing the formula itself. Is this formula true or false?

$$\forall p \exists s \forall q((q \vee s) \rightarrow \neg p)$$