COMP21111 Assignment 9
20 marks

Deadline: 10th Dec., time 12:00, SSO

Show your working.

Problem 1 (6 marks)

Let x be a variable with the domain $\{a, b, c, d\}$ and p be a boolean variable. Consider the following formula:

$$\neg((p \rightarrow \neg x = a) \rightarrow x = b \vee x = c \vee \neg p).$$

Transform this formula to propositional logic.

Problem 2 (7 marks)

A variable x in propositional logic of finite domains has the domain $\{a, b, c, d\}$. Using the tableau method, check whether the formula

$$\neg x \in \{a\} \rightarrow (x \in \{a, b, d\} \rightarrow x \in \{b, c, d\} \wedge x \in \{d\})$$

is valid.

Problem 3 (7 marks)

Consider the transition system with the state transition graph shown on the right.

1. Find sates symbollicaly represented by the formula $x \rightarrow y$.
2. Find a symbolic representation of the set of states $\{s_2, s_3\}$.
3. Find a symbolic representation of the set of transitions $\{(s_2, s_1), (s_2, s_3)\}$.