MAU22C00: TUTORIAL 9 PROBLEMS
FORMAL LANGUAGES AND GRAMMARS

1) Let L be the language over the alphabet $A = \{0, 1\}$ consisting of all words where the string 00 occurs as a substring.

(a) Prove from the definition of a regular language that the language L is regular.

(b) Draw a finite state acceptor that accepts the language L. Carefully label all the states including the starting state and the finishing states as well as all the transitions. Make sure you justify it accepts all strings in the language L and no others.

(c) Write down the transition mapping of the finite state acceptor you drew in the previous part of the problem.

(d) Let $\equiv_L$ be the equivalence relation defined in Lecture 23 before the statement and proof of the Myhill-Nerode theorem. Determine the equivalence classes into which this equivalence relation partitions L.