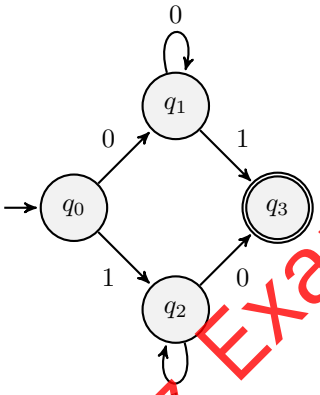
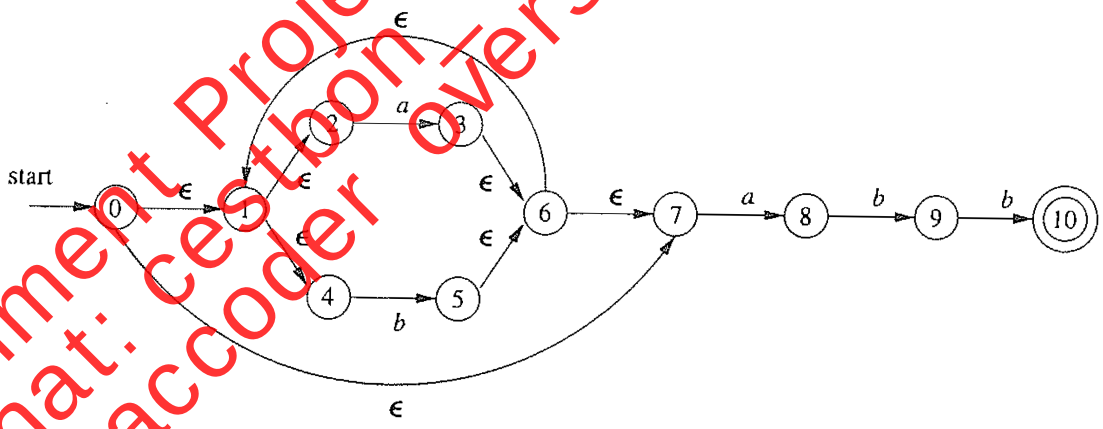
CSC 330 Programming Language Concepts

Assignment I

1. (1 point) Give the formal description of the machine below:



2. (1 point) Convert the following NFA to an equivalent DFA:



3. (1 point) Convert the following regular expressions to NFA:
   (a) $(0 \cup 1)^* \, 000 \, (0 \cup 1)^*$
   (b) $\Big(\big((00)^* \, (11) \big) \cup 01 \Big)^*$

4. (1 point) Give DFAs recognizing the following languages. In all parts, the alphabet $\Sigma = \{0, 1\}$.
   (a) $\{ w \mid w$ begins with a 1 and ends with a $0 \}$
   (b) $\{ w \mid w$ contains at least three 1s $\}$

5. (1 point) For each of the following languages, give two strings that are members and two strings that are not members. Assume the alphabet $\Sigma = \{ a, b \}$.
   (a) $a \, (ba)^* \, b$
   (b) $\Sigma^* \, a \, \Sigma^* \, b \, \Sigma^* \, a \, \Sigma^*$