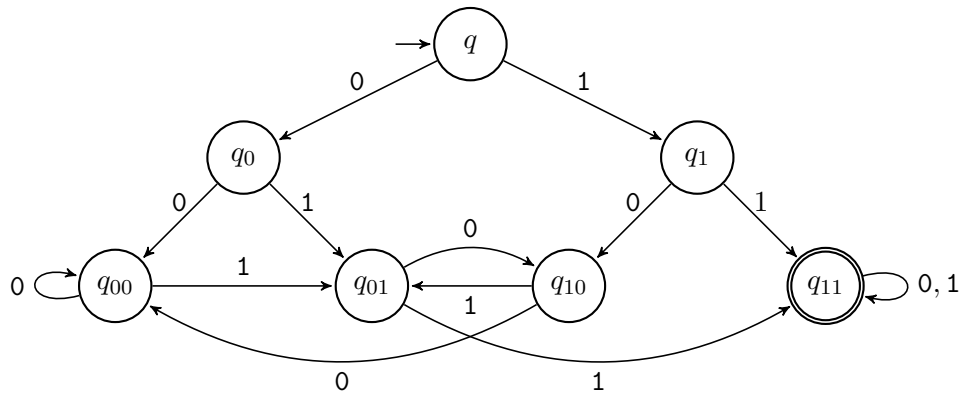**Week 6 Tutorial Session**

1. This problem concerns the following DFA.

   (a) Run the minimization algorithm on this DFA. Show the table of pairs of distinguishable states at the end of the algorithm. Also draw the minimized DFA.

   (b) Show that every pair of states in the minimized DFA is distinguishable.

   (c) Convert the minimized DFA into a regular expression using the conversion algorithm from class. Show the preprocessing step and how the NFA changes after each state is eliminated.

2. Show that the following language is irregular using the pumping lemma.

   $L = \{w \in \{0,1\}^* \mid w$ contains the same number of 0s and 1s$\}$