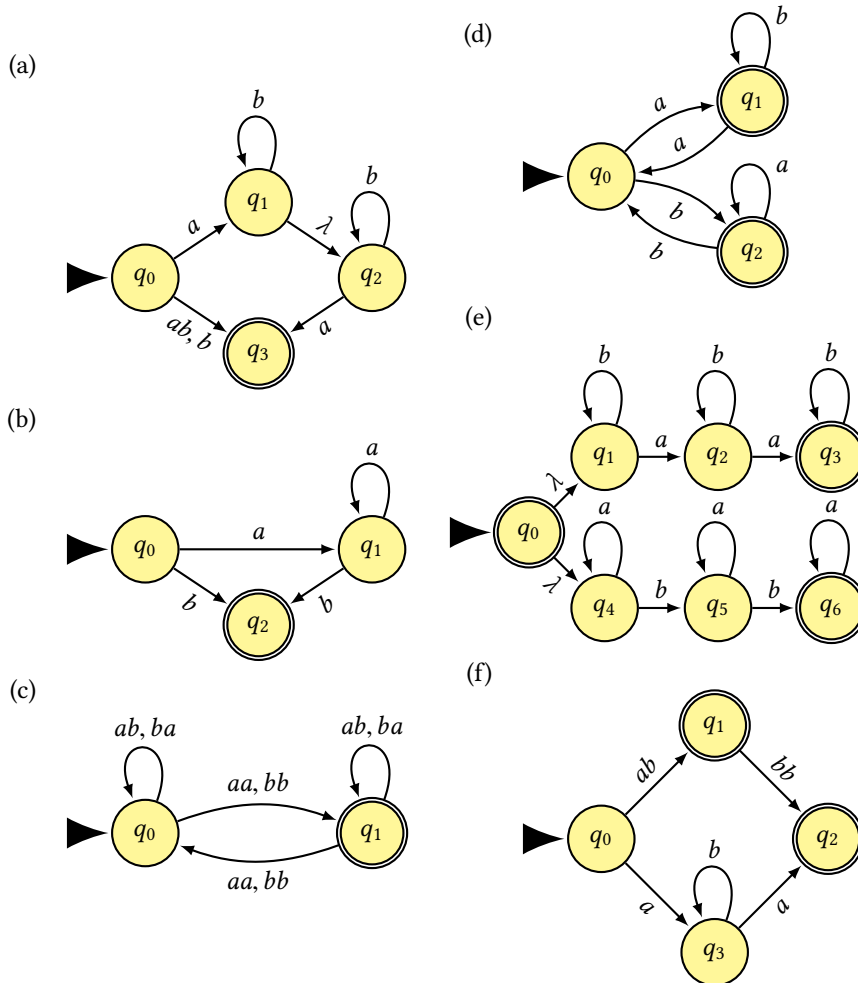


CSCI 340 – Homework 3

Professor Killian

Due: February 10, 2019 @ 11:59PM

1. For each of the ten following words, decide which of the 6 machines below accept the given word: λ a b aa ab aba $abba$ bab $baab$ $abbb$



- Build a TG that accepts the language L_1 of all words that begin and end with the same double letter, either of the form $aa \dots aa$ or $bb \dots bb$.
Note: aaa and bbb are not words in this language
- Prove that for every TG there is another TG that accepts the same language but only has one final/accepting state.
- Given a TG, called TG_1 , that accepts the language L_1 and a TG, called TG_2 , that accepts the language L_2 , show how to build a new TG (called TG_3) that accepts exactly the language $L_1 + L_2$.
- A student walks into a classroom and sees on the blackboard a diagram of a TG with two states that accepts only the word λ . The student reverses the direction of exactly one edge, leaving all other edges, labels, initial states, and final states the same. But now the new TG accepts the language a^* . What was the original machine?