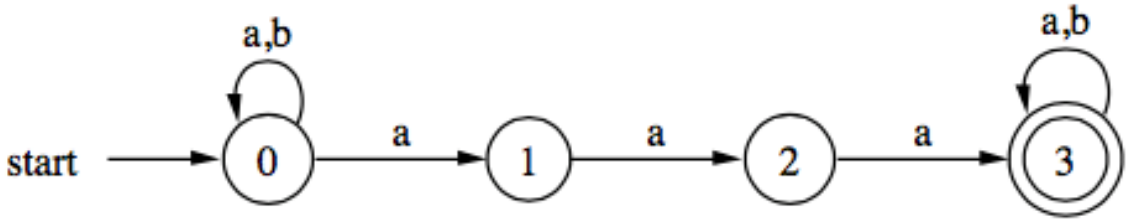
Practice Exam

1. Is the set A = { $a^{2n}b^{3m}$ | n,m ≥ 0 } regular ? If your answer is yes, construct a FSA that accepts A. If your answer is no, then use the pumping lemma to show that A is not regular.

2. Is the set B = { $a^{2n}b^{3m}$ | n, m ≥ 0 and n=m } regular ? If your answer is yes, construct a FSA that accepts B. If your answer is no, then use the pumping lemma to show that B is not regular.

3. (**Subset construction**) Transform the following FSA into a deterministic FSA that accepts the same language.



4. (**Pumping Lemma)** Show that L′ is not regular.

$$L' = \{a^n b^{2m} \mid n = m\}$$

5. Find a regular expression **α** such that the language of **α**, L(**α**), is the set of all strings over the alphabet {a,b} that contains the substrings aa and bb. For example baababba is in L(**α**) but baaba is not in L(**α**)

6. Transform the regular expression (000* + 111*)* into an automaton that accepts the same language.

7. Transform the following automaton into a regular expression that accepts the same language