Final Exam
Theory of Computation (CSCI 3500), Fall 2021

Name: _____

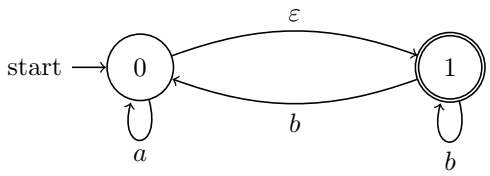
Score: _____

The following are several long answer questions. Please write legibly, and clearly mark your solution.

0. Define a Turing Machine that accepts the following language:

$$L = \{w \in \{!, \square\}^* \mid w = vw'v \text{ where } v, w' \in \{!, \square\}^*, |w'| = 2, \text{ and } |v| = 3\}$$

1. Convert the following NFA into an equivalent NFA using the NFA-to-DFA algorithm:



2. Define a context-free grammar that generates the following language:

$$L = \{w \in \{a, b\}^* \mid w = ab^i c^j a \text{ where } i \leq j\}$$