CMSC330 Fall 2023 Quiz 2

This is a culmination of 4 quizzes.

Proctoring TA: ______________________ **Name:** ______________________

Section Number: ______________________ **UID:** ______________________

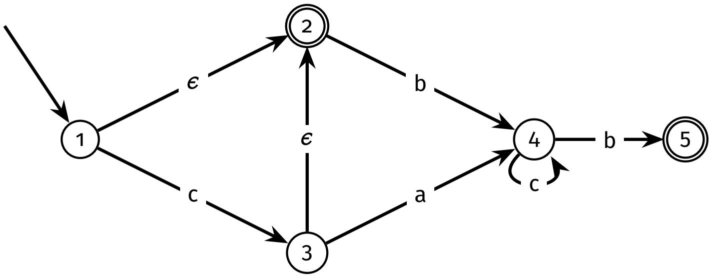
Problem 1: Basics

[Total 4 pts]

	True	False
Checking to see if an **arbitrary string of size 5** is a palindrome can be calculated with a FSM.	T	F
Checking to see if an **arbitrary string of any size** is a palindrome can be calculated with a FSM.	T	F
FSMs can represent regular languages	T	F
Every regular expression has **exactly one** corresponding DFA.	T	F
On average, compared to a DFA, checking acceptance with an NFA is more computationally expensive	T	F
NFAs have exactly one path during a graph traversal for any given input	T	F
All DFAs are NFAs.	T	F
A DFA can have a **only one** start state and final state	T	F

Problem 2: Finite State Machine Analysis

[Total 4 pts]



Which strings would the above Finite State Machine accept? Select all that apply.

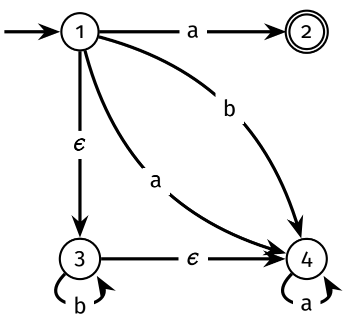
A bb   B cab   C caccccab   D baccccb   E cb
F c   G cabb   H the empty string   I cbcb   J cbb

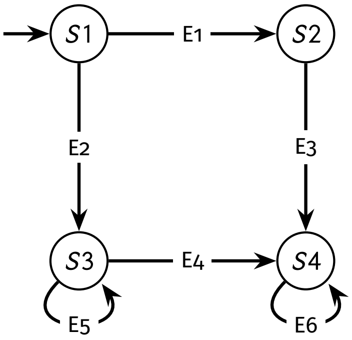
Write a regular expression that is equivalent to the above Finite State Machine:

Problem 3: NFA to DFA

[Total 12 pts]

Consider the NFA and fill in the blanks of the equivalent DFA. Use the subset construction (on-demand) algorithm we gave in lecture/discussion. We will only be checking state names for partial credit.





S1: □ S2: □ S3: □ S4: □

E1: □ E2: □ E3: □

E4: □ E5: □ E6: □

What state(s) are final states? Select all that apply:

Ⓐ $S1$ Ⓑ $S2$ Ⓒ $S3$ Ⓓ $S4$

Scratch Space: