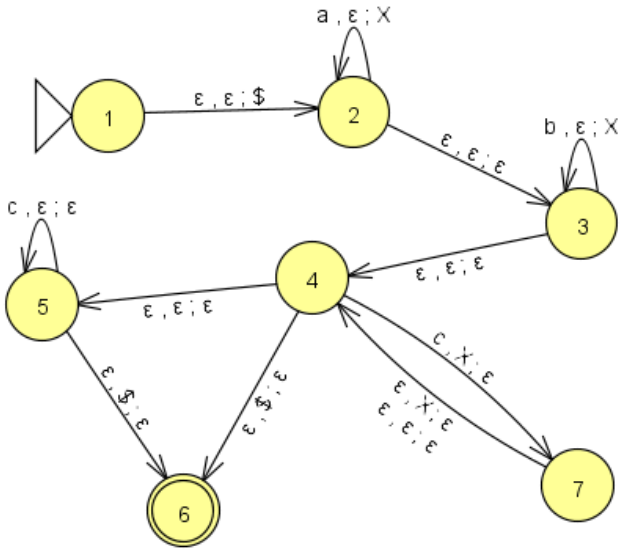
CS 361 – Homework 5

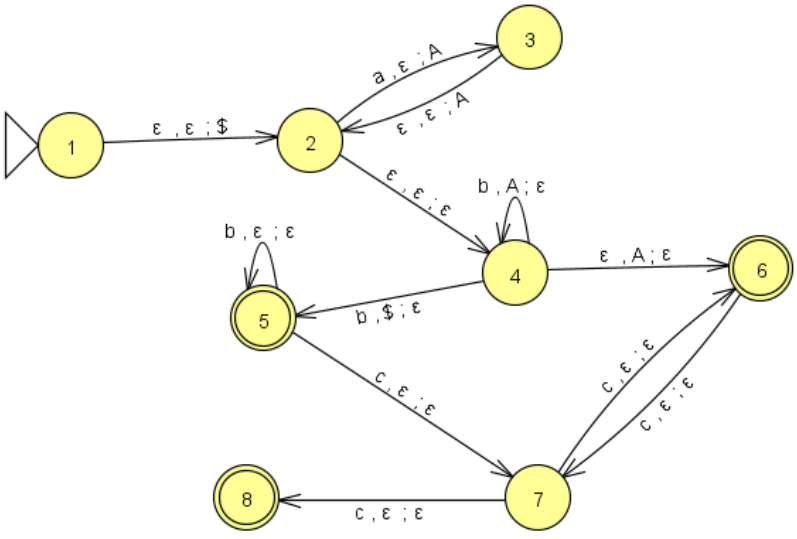
Total possible points: 60

1. (15 points) Construct a **pushdown automaton** for $A=\{a^n b^m c^i \mid 0 \le n+m \le 2i\}$

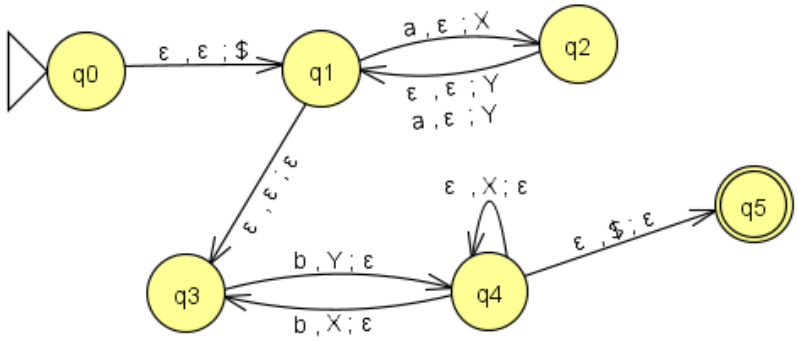
ε



2. (15 points) Design a **pushdown automaton** recognizing $B = \{a^n b^m c^i \mid i, n, m > 0, n \neq 2m, i \text{ is even}\}$.



3. (15 points) Design a **pushdown automaton** recognizing C= { $a^m b^n$ | m ≥ 0, 2m ≥ n ≥ m}



4. (15 points) Consider the following grammar G:

S→01Sba|A
A→abA10|ϵ |B
B->ccB| ϵ

a. What are the variables of G?

: V = {S, A, B}

b. What are the terminals of G?

: ∑ = {0, 1, a, b, c}

c. What is the start variable of G?

: start variable = S

d. Give 2 strings that are in L(G)

: ε, cc

e. Give 2 strings over the alphabet of G that are not in L(G)

: 0110, aaa

f. True or False: R⇒* 01abcc10ba

: True

g. True or False: R⇒* 01baccab10

: False

h. True or False: R⇒* 01ccba

: True

i. True or False: R⇒* ϵ

: True

j. Describe L(G) using set notation, i.e., which types of strings are generated using G

: L(G) = { $(01)^a\ (ab)^b$ | a, b is greater than 0 }