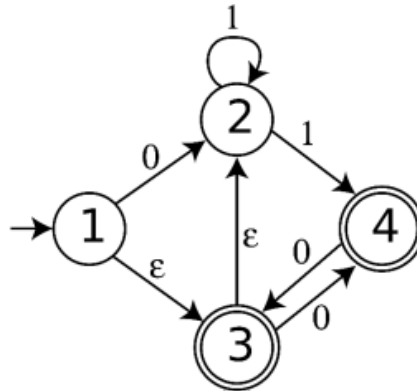# CSE 2233 Assignment - 1

Instructions:
- Use offset/normal white paper for writing the answer.
- You must write your student ID and name on the first page.
- On each page, clearly write the page number.

1. Convert the following ε-NFA over alphabet $\sum$ = {0,1} to an equivalent DFA.

2. Design DFAs that accepts the following languages:
   a) L = {w | w starts and ends with different symbols and the length of w is even | Σ= {0, 1}
   b) L = {w | w contains at least two 'a's and at most one 'b'} | Σ = {a, b}
   c) L = {w | w contains an even number of 0's or odd number of 2's over Σ = {0, 1, 2}

3. Design Regular Expression for the following languages where Σ={a,b}:
   a. All strings w having even length strings and starting with a or odd length strings starting with b.
   b. All strings w which begins and ends with b.
   c. All strings w where every a is followed by at least one b.

4. Design NFAs that accepts the following languages:
   a. L= starts and ends with the same symbol with total length at least 2 | $\sum$ = {0,1}
      Sample Valid: 00,11,010,1010101 Sample Invalid: 100, 0
   b. L= contains 'xx' or 'yx' or 'zz' and ends with 'yz' or 'y' | Σ = {x,y,z}
      Sample Valid: zyxy, zxxzzy Sample Invalid: xyzyz, yxxz
   c. L =starts with '0x0 and contains '0' or 'x' and ends with '0' | $\sum$ = {0,x,y}
      Sample Valid: 0x0,0x0yyy0 Sample Invalid: 0xx0, 0xy0x