1. Design a DFA for the language L = {w∈{0,1}\* | w contains both 01 and 10 as substrings}.
2. Design a NFA within four states for the language {a}\*∪{ab}\*.
3. Design regular expressions for language over Σ = {0,1}.

(1). All strings contain the substring 001.

(2). All strings expect the string 001.

1. Prove that L = {0m1n | m/n is an integer} is not regular with pumping lemma.
2. Convert the following NFA into DFA with subset construction.
3. Give a context-free grammar for L = { aibjci+j|i,j>=0}
4. Let L be the language generated by the grammar G below

S->AB|BBB A->Bb|ε B->aB|A

(1). Eliminate ε-productions.

(2). Eliminate any unit productions in the resulting grammar.

(3). Convert to CNF.

1. Design a PDA for L = {w∈{a,b}\*|w has more a’s than b’s}
2. Prove : for every context free language L, the language L’ = {0|w||w∈L} is also context free.
3. Design a Turing Machine that computes the following function f:0n->Binary(n). Where integer n>=1 and binary(n) is the binary representation of n. For example: f(03) = 11 f(05) = 101.