Solutions for Assignment 2

1(a)

NFA - aabba:

S0 = {1}

S1 = ε-closure({1}) = {1, 2, 6}

S2 = ε-closure(move({1, 2, 6}, a)) = ε-closure({2, 3, 7}) = {2, 3 ,7 ,10}

S3 = ε-closure(move({2, 3, 7, 10}, a)) = ε-closure({2, 3, 5}) = {2, 3, 5, 6, 8}

S4 = ε-closure(move({2, 3, 5, 6, 8}, b)) = ε-closure({4, 8, 9}) = {4, 5, 6, 8, 9}

S5 = ε-closure(move({4, 5, 6, 8, 9}, b)) = ε-closure({2, 8, 9}) = {2, 8, 9}

S6 = ε-closure(move({2, 8, 9}, a)) = ε-closure({2, 3, 9}) = {2, 3, 9}

{2, 3, 9} ∩ {9, 10} = {9} => Accept

1(b)

NFA - aabab:

S0 = {1}

S1 = ε-closure({1}) = {1, 2, 6}

S2 = ε-closure(move({1, 2, 6}, a)) = ε-closure({2, 3, 7}) = {2, 3, 7, 10}

S3 = ε-closure(move({2, 3, 7, 10}, a)) = ε-closure({2, 3, 5}) = {2, 3, 5, 6, 8}

S4 = ε-closure(move({2, 3, 5, 6, 8}, b)) = ε-closure({4, 8, 9}) = {4, 5, 6, 8, 9}

S5 = ε-closure(move({4, 5, 6, 8, 9}, a)) = ε-closure({7, 9}) = {7, 9, 10}

S6 = ε-closure(move({7, 9, 10}, b)) = ε-closure({10}) = {10}

{10} ∩ {9, 10} = {10} => Accept

2(a)

DFA - aabba

S0 = 1

S1 = move(S0, a) = move(1, a) = 2

S2 = move(S1, a) = move(2, a) = 2

S3 = move(S2, b) = move(2, b) = 4

S4 = move(S3, b) = move(4, b) = 7

S5 = move(S4, a) = move(7, a) = 7

7 is in {7, 8} => Accept

2(b)

DFA - aabab

S0 = 1

S1 = move(S0, a) = move(1, a) = 2

S2 = move(S1, a) = move(2, a) = 2

S3 = move(S2, b) = move(2, b) = 4

S4 = move(S3, a) = move(4, a) = 8

S5 = move(S4, b) = move(8, b) = 8

8 is in {7, 8} => Accept