

CS3133
HW #3 SOLUTIONS

1. b) i) $[q_0, abaa] \mapsto [q_0, baa] \mapsto [q_1, aa] \mapsto [q_2, a] \mapsto [q_2, \lambda]$
 ii) $[q_0, bbbabb] \mapsto [q_1, bbabb] \mapsto [q_1, babb] \mapsto [q_1, abb] \mapsto [q_2, bb] \mapsto [q_0, b] \mapsto [q_1, \lambda]$
 iii) $[q_0, bababa] \mapsto [q_1, ababa] \mapsto [q_2, baba] \mapsto [q_0, aba] \mapsto [q_0, ba] \mapsto [q_1, a] \mapsto [q_2, \lambda]$
 iv) $[q_0, bbbaa] \mapsto [q_1, bbaa] \mapsto [q_1, baa] \mapsto [q_1, aa] \mapsto [q_2, a] \mapsto [q_2, \lambda]$

c) $\{abaa, bababa, bbbaa\}$

d) $(a \cup b)^* bb^* aa^*$ That is, any string over $\{a, b\}^*$ which ends in a nonempty string of b 's followed by a nonempty string of a 's.

2. $Q = \{q_0, q_1, q_2, q_3\}, F = \{q_0, q_1, q_2\},$

δ	a	b	c
q_0	q_0	q_1	q_2
q_1	q_3	q_1	q_2
q_2	q_3	q_3	q_2
q_3	q_3	q_3	q_3

3. $Q = \{q_0, q_1, q_2, q_3\}, F = \{q_0, q_1, q_2\},$

δ	a	b
q_0	q_1	q_0
q_1	q_2	q_0
q_2	q_3	q_0
q_3	q_3	q_3

4. $Q = \{q_0, q_1\}, F = \{q_0\},$

δ	a	b
q_0	q_1	q_0
q_1	q_0	q_1

5. $Q = \{q_0, q_1, q_2\}, F = \{q_2\},$

δ	a	b
q_0	\emptyset	$\{q_1\}$
q_1	$\{q_1\}$	$\{q_1, q_2\}$
q_2	\emptyset	\emptyset