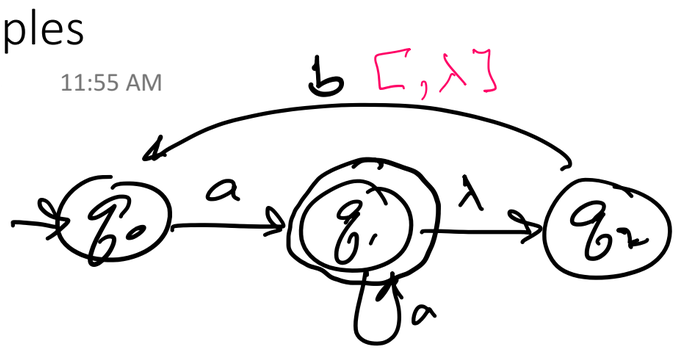
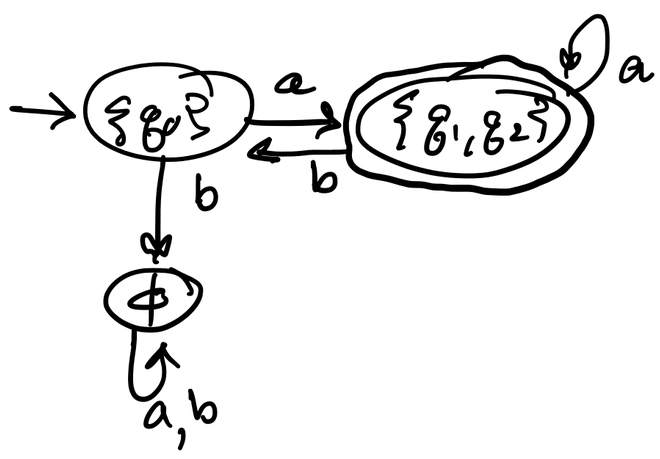
nfa -> dfa examples

Thursday, September 19, 2024 11:55 AM

nfa :



dfa :



✓

$\delta^*_n(q_0, a) = \{q_1, q_2\}$

1. $q_0\ a\ q_1$
2. $q_0\ a\ q_1\ \lambda\ q_2$
3. ~~$q_0\ a\ q_1\ \lambda\ q_2\ \lambda\ q_0$~~
4. ~~$q_0\ a\ q_1\ \lambda\ q_2\ \lambda\ q_0\ a\ q_1$~~

$\delta^*_n(q_0, b) = \phi$

$\delta^*_n(\phi, a) = \phi$

$\delta^*_n(\phi, b) = \phi$

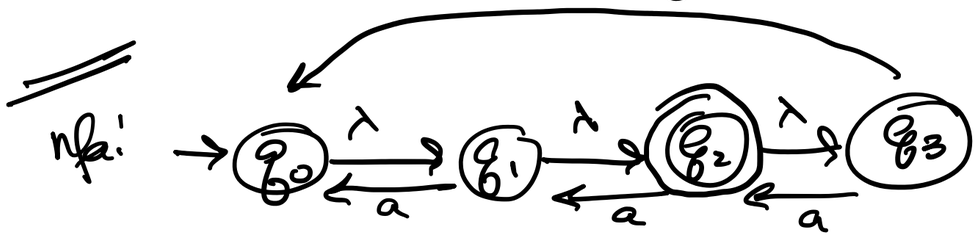
$\delta^*_n(\{q_1, q_2\}, a) = \delta_n^*(q_1, a) \cup \delta_\lambda^*(q_2, a)$

$= \{q_1, q_2\} \cup \phi = \{q_1, q_2\}$

$\delta^*_n(\{q_1, q_2\}, b) = \delta_\lambda^*(q_1, b) \cup \delta_n^*(q_2, b)$

$= \{q_0\} \cup \{q_0\} = \{q_0\}$

nfa:



$\Sigma = \{a, b\}$

dfa :

- $(q_0, a) = \{q_0, q_1, q_2, q_3\}$ ✓ $(q_0, b) = \{q_0, q_1, q_2, q_3\}$ ✓
- $(q_1, a) = \{q_0, q_1, q_2, q_3\}$ ✓ $(q_1, b) = \{q_0, q_1, q_2, q_3\}$ ✓
- $(q_2, a) = \{q_1, q_2, q_3\}$ ✓ $(q_2, b) = \{q_0, q_1, q_2, q_3\}$ ✓
- $(q_3, a) = \{q_2, q_3\}$ ✓ $(q_3, b) = \{q_0, q_1, q_2, q_3\}$ ✓

- $(\{q_0, q_1, q_2, q_3\}, a) = *$ $(\{q_0, q_1, q_2, q_3\}, b) = \{q_0, q_1, q_2, q_3\}$
- $(\{q_1, q_2, q_3\}, a) = \{q_0, q_1, q_2, q_3\}$ $(\{q_1, q_2, q_3\}, b) = \{q_0, q_1, q_2, q_3\}$
- $(\{q_2, q_3\}, a) = \{q_1, q_2, q_3\}$ $(\{q_2, q_3\}, b) = \{q_0, q_1, q_2, q_3\}$

$* (q_0, a) \cup (q_1, a) \cup (q_2, a) \cup (q_3, a)$

$= \{q_0, q_1, q_2, q_3\} \cup \{q_0, q_1, q_2, q_3\} \cup \{q_0, q_1, q_2, q_3\} \cup \{q_2, q_3\}$

$= \{q_0, q_1, q_2, q_3\}$

dfa