

Finite State Transducers (FSTs)

- See Probs. 1-24 thru 1-27
- Most real-world DFAs have “output”
 - Traffic Light Controller: color of lights
 - Door opener from book: door motor
- **Finite State Transducer**: DFA with “output” other than just accept/reject
 - Output changes with DFA operation
- Assume output from new alphabet Γ
- **Moore Machines**: output depends on current state
 - If in state q , always output some value $g(q)$ from Γ
 - In state diagrams, modify state names to “ q_i/r_j ” where
 - q_i is name of state; r_j is output character
- **Mealy Machines**: Current output a function of current state *and* current input (see problem 1.24)
 - If in state q , output depends on current input x
 - Typically redefine δ as $Q \times \Sigma \rightarrow Q \times \Gamma$
 - In state diagrams, modify transitions out of q_i to x/r where
 - x is input character from Σ causing transition
 - r is output character from Γ associated with $\delta(q_i, x)$