HW (due Wed. Nov. 7)

Let's formalize the following state machine for blackjack. We begin in a state called START, in which only one action is available (called DEAL). We are dealt a hand with two cards, each of which has a value from 1 to 10 (we assume aces always count as 1). This puts us in state A_k, where k is the total value of the two cards. We can then either STAND, in which case we enter state WIN, LOSE, or DRAW (depending on what the dealer gets) or we HIT to receive a new card. Assume $[x, y]$ is the set of ints from x to y (inclusive).

$$Q = \{\text{START}, \text{WIN}, \text{LOSE}, \text{DRAW}\} \cup \{\underline{\quad ? \quad}\}$$

$$\Sigma = \{\text{DEAL}, \underline{\quad ? \quad}, \underline{\quad ? \quad}\}$$

$$\Delta = \{(\text{START}, \underline{\quad ? \quad}, \underline{\quad ? \quad}) \mid A_k \in [\underline{\quad ? \quad}, \underline{\quad ? \quad}]\}$$
$$\cup \{(A_k, \text{STAY}, q) \mid k \in [2, 20], q \in \underline{\quad ? \quad}\}$$
$$\cup \{(A_{21}, \text{STAY}, q) \mid q \in \underline{\quad ? \quad}\}$$
$$\cup \{(A_k, \text{HIT}, \underline{\quad ? \quad}) \mid k \in \underline{\quad ? \quad}, m \in [1, 10], \underline{\quad ? \quad}\}$$
$$\cup \{(\underline{\quad ? \quad}, \underline{\quad ? \quad}, \underline{\quad ? \quad}) \mid k \in \underline{\quad ? \quad}\}$$

$$F = \{\underline{\quad ? \quad}\} \qquad q_0 = \underline{\quad ? \quad}$$