State Diagrams to State Tables

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- Traffic Light Controller
  - Traffic sensors (T_A, T_B) are true when there is traffic
  - The lights are denoted as L_A, L_B
  - Create an FSM "Black Box" with only inputs and outputs
    - Inputs: Clock, Reset, T_A, T_B
    - Outputs: L_A, L_B
  - FSM State Transition Diagram
    - Moore FSM: Outputs labeled in each state
    - States: Circles
    - Transitions: Arcs
- Three-Cycles High Laser Timer
  - Four states
  - Wait in "off" state while b is 0 (b')
  - When b is 1 (and rising clock edge), transition to On1
    - Sets x to 1
- Vending Machine
  - Releases item after 15 cents are deposited
  - Single coin slot for dimes, nickels
  - No change
  - Suitable Abstract representation
    - Tabulate typical input sequence
      - 3 nickels
      - nickel, dime
      - dime, nickel
      - two dimes
    - Draw state diagram
      - Inputs: N, D, reset
      - Output Open chute
    - Assumptions
      - Assume N and D asserted for one cycle
      - Each state has a self loop for $N = D = 0$ (no coin)
    - To minimize number of states, reuse states when possible
    - Also, always uniquely encode states
    - Then use K-Maps to map to logic
- In summary, keep track of inputs and outputs, minimize number of states through reuse, and use K-Maps to map logic