

# Implementing the Control

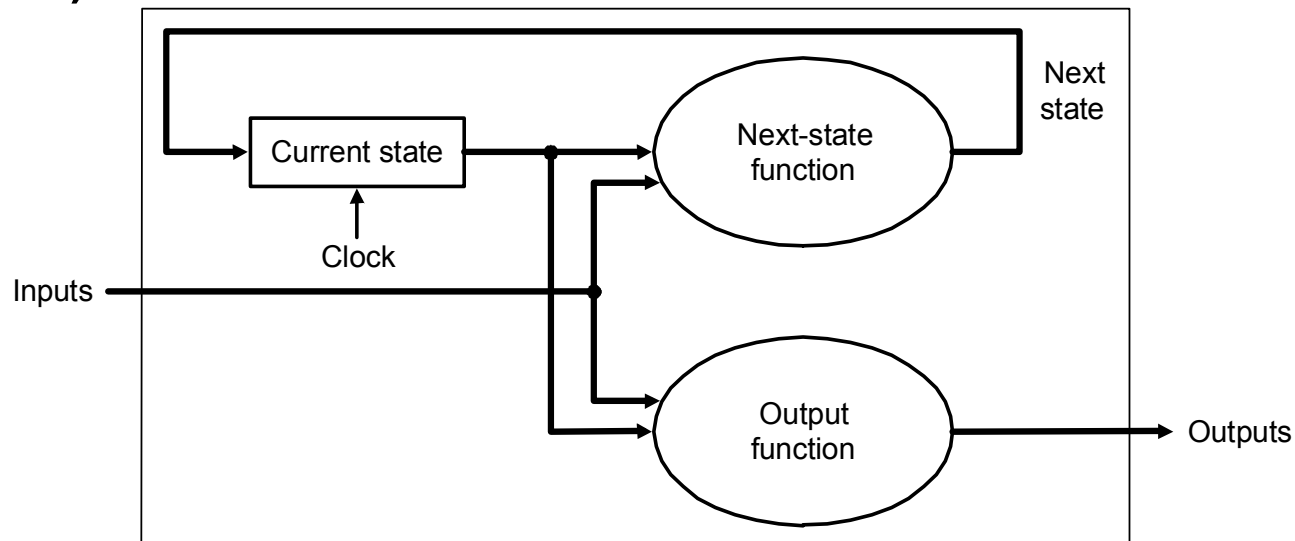
---

- ❑ **Value of control signals is dependent upon:**
  - what instruction is being executed
  - which step is being performed
  
- ❑ **Use the information we've accumulated to specify a finite state machine**
  - specify the finite state machine graphically, or
  - use microprogramming
  
- ❑ **Implementation can be derived from specification**

# Review: finite state machines

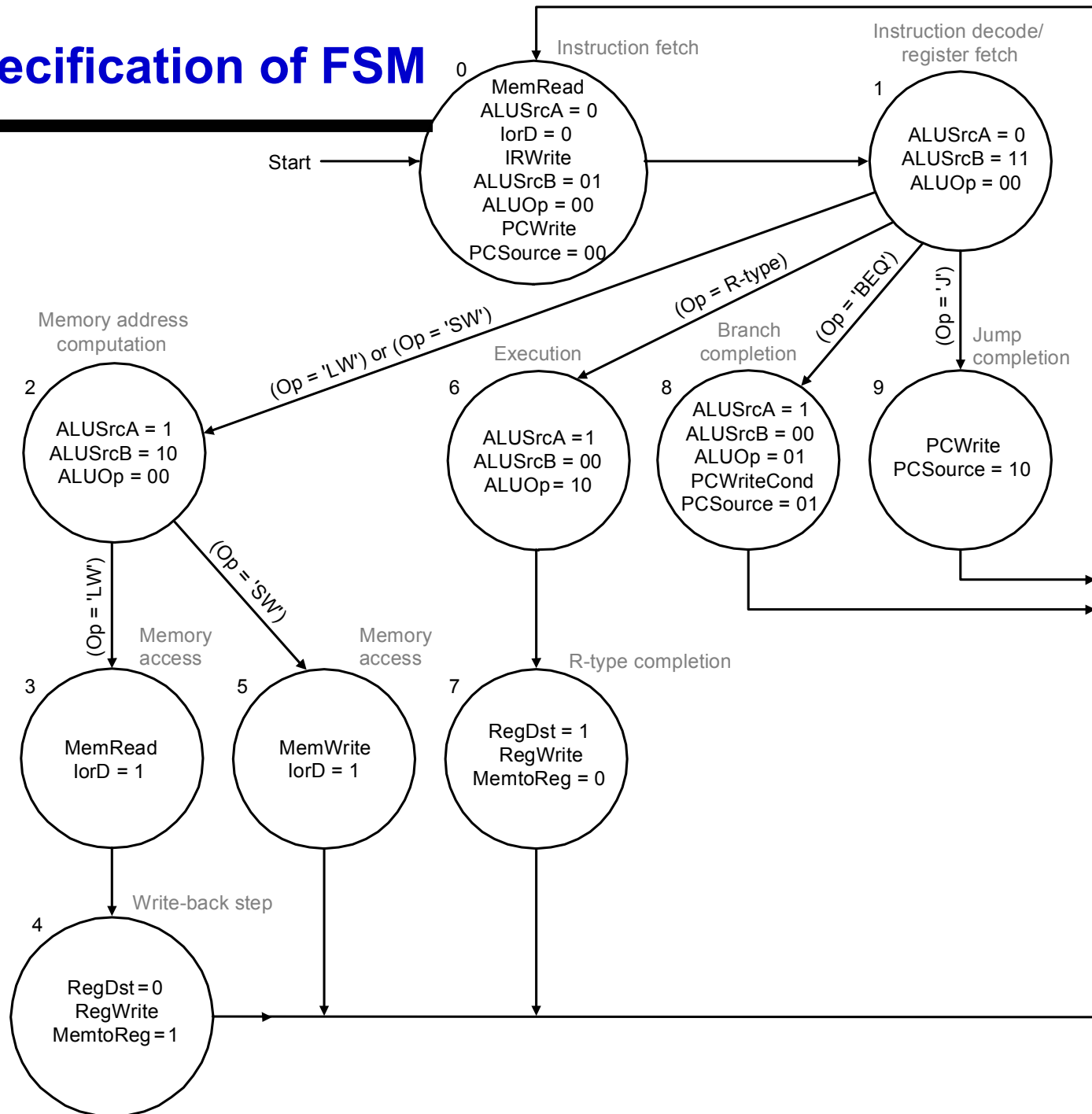
## □ Finite state machines:

- a set of states and
- next state function (determined by current state and the input)
- output function (determined by current state and possibly input)



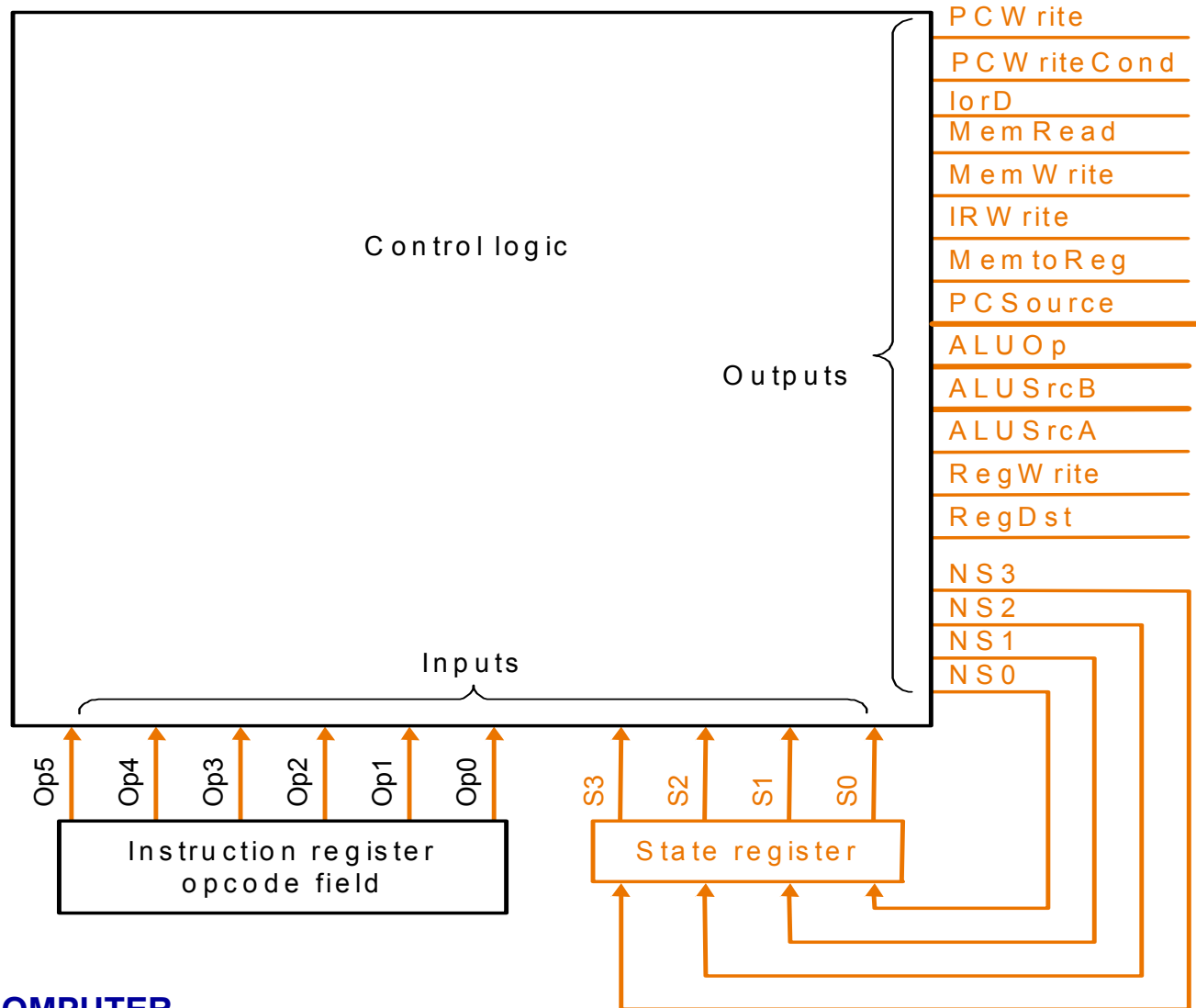
- We'll use a Moore machine (output based only on current state)

# Graphical Specification of FSM

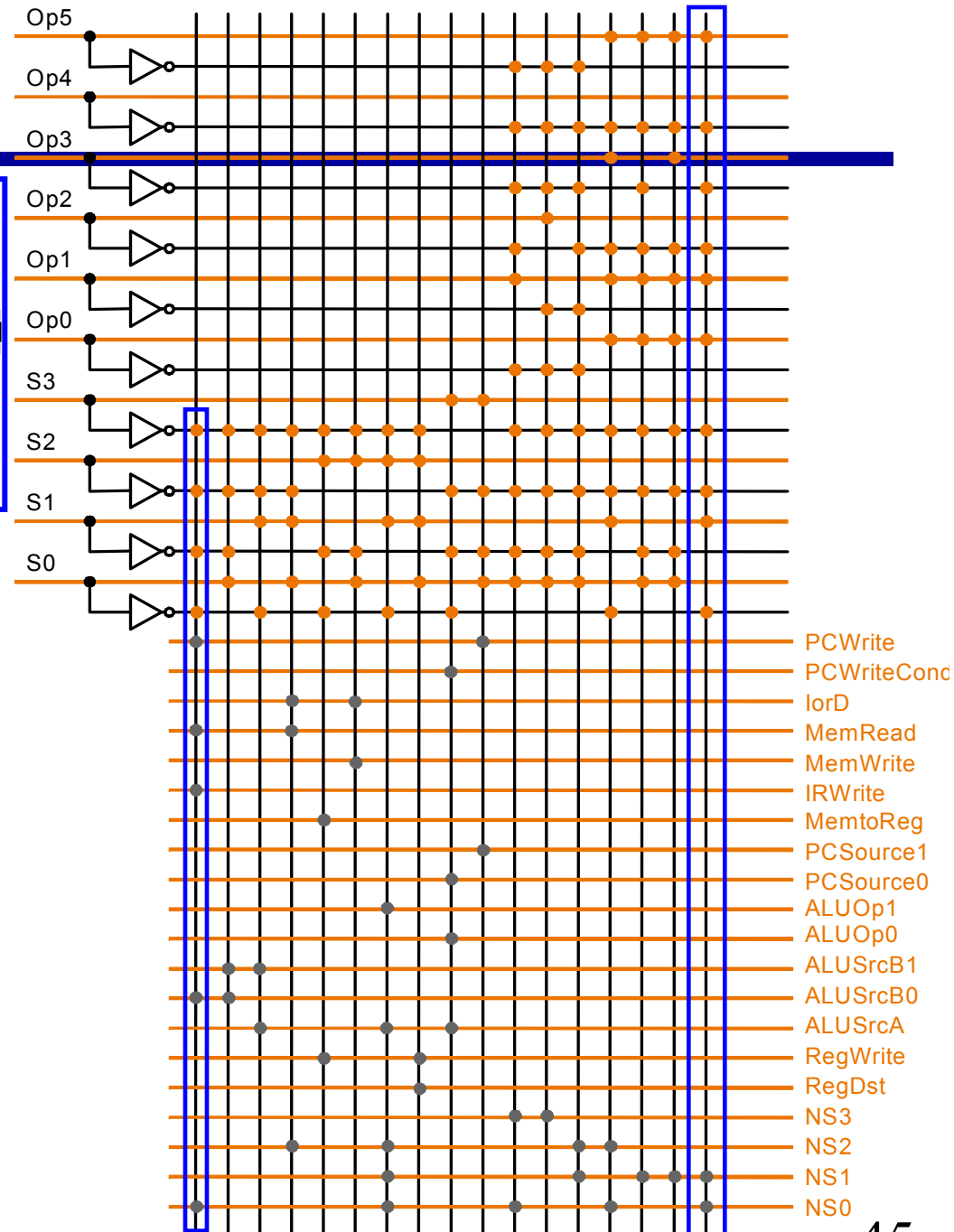
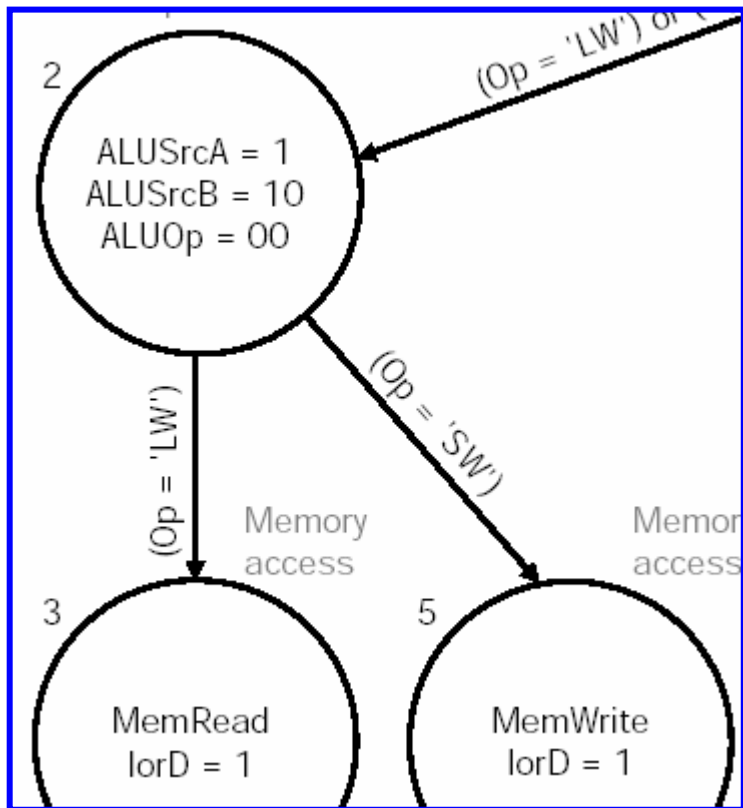
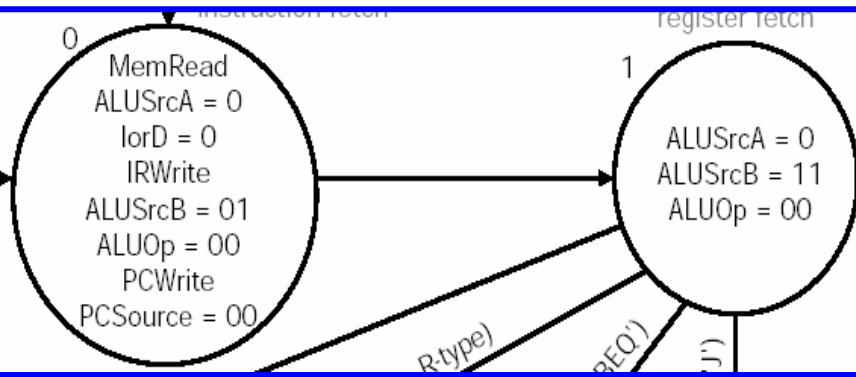


# Finite State Machine for Control

## Implementation:



# PLA Implementation



# Other Implementation

---

## ❑ ROM (read only memory)

- Stores the truth table of inputs, states and outputs
- PLA is much smaller in the amount of logic

## ❑ Microprogramming

- Executes microinstructions to generate signals
- Suitable for large number of opcodes and complex control signals.