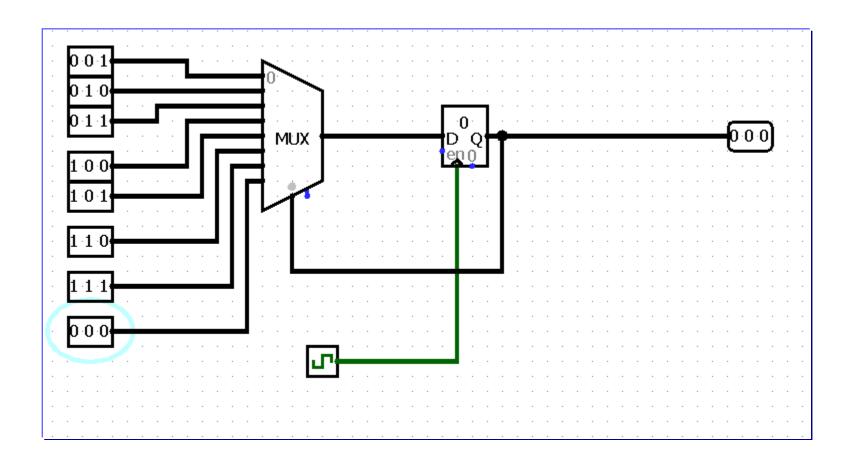
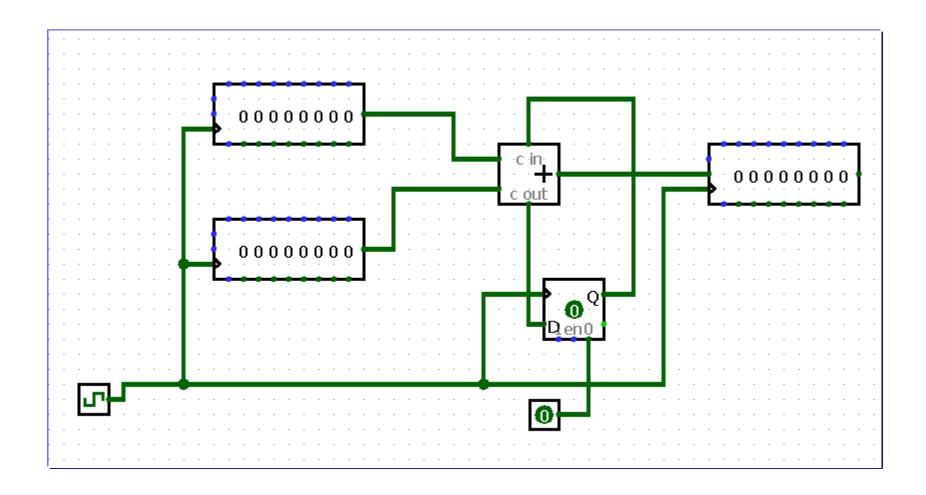
# Finite-State Machines (FSMs) and Controllers

# FSM design -examples



# FSM design -examples

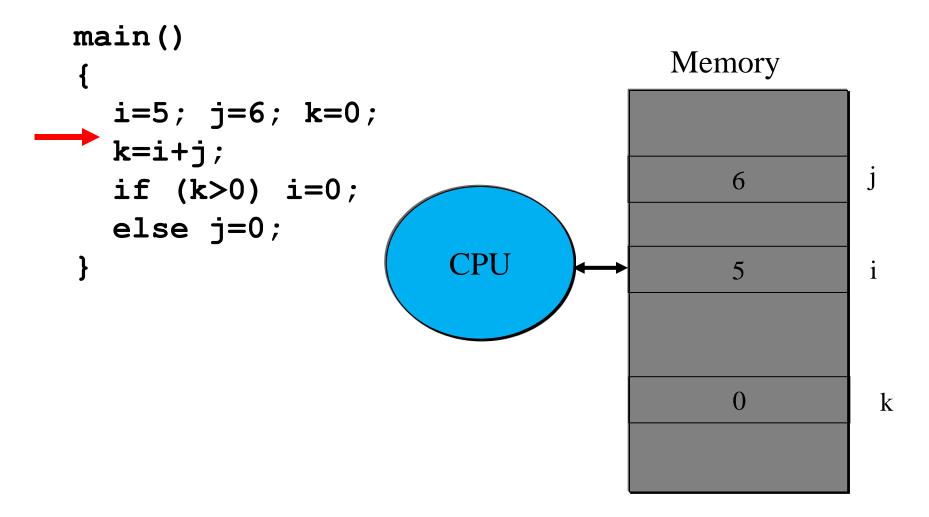


## Consider the Program

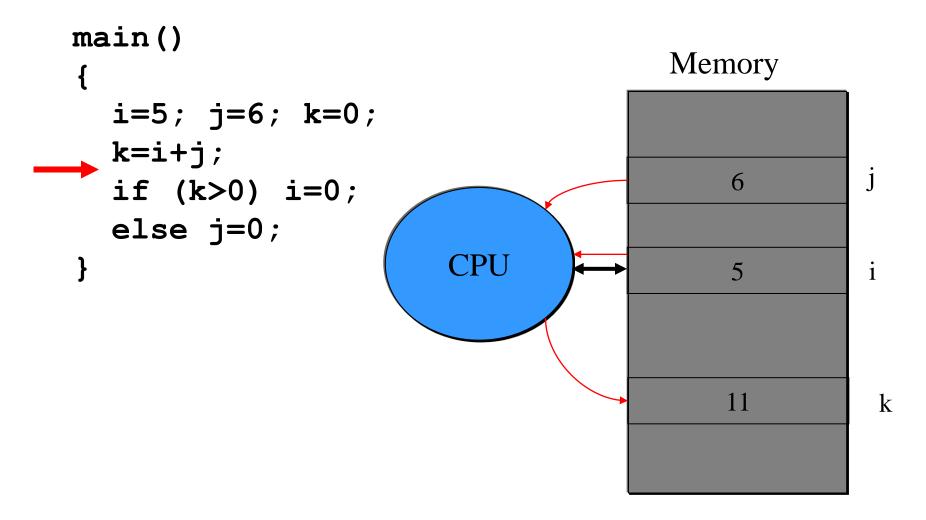
```
main()
{
    i=5; j=6; k=0;
    k=i+j;
    if (k>0) i=0;
    else j=0;
}
```

Can this program be modeled with a FSM?

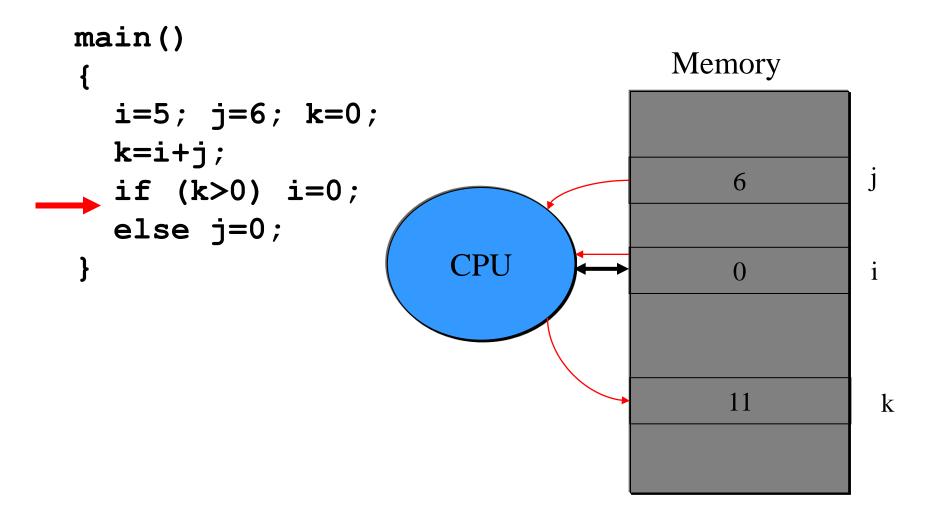
#### **Initial State**



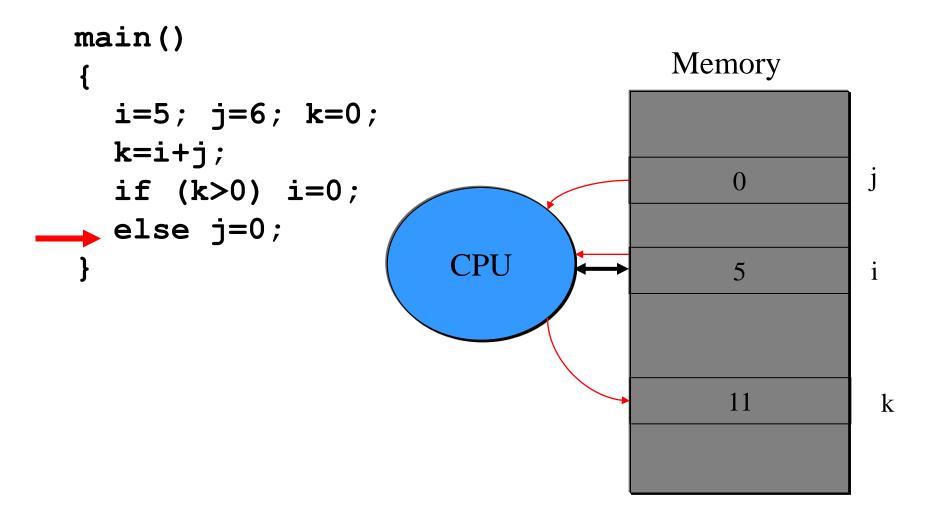
### State 1



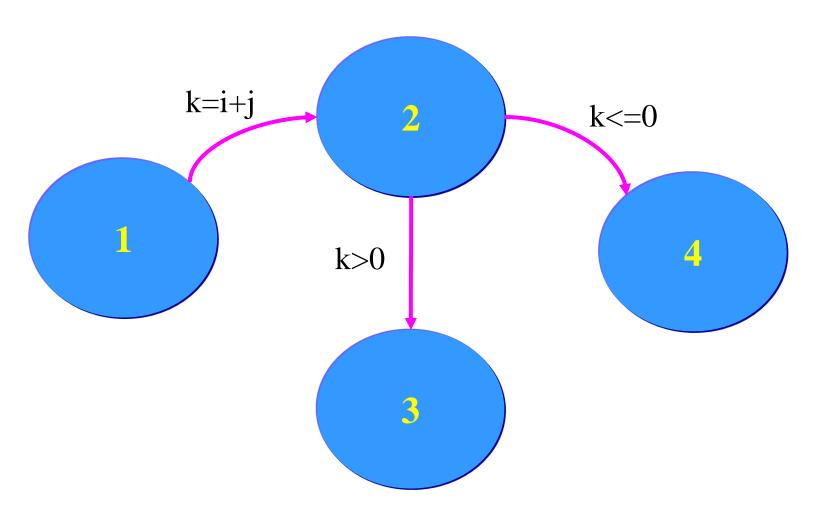
#### State 2



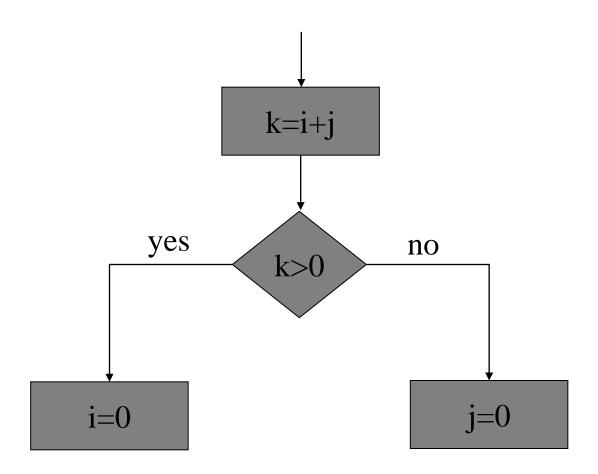
### State 3



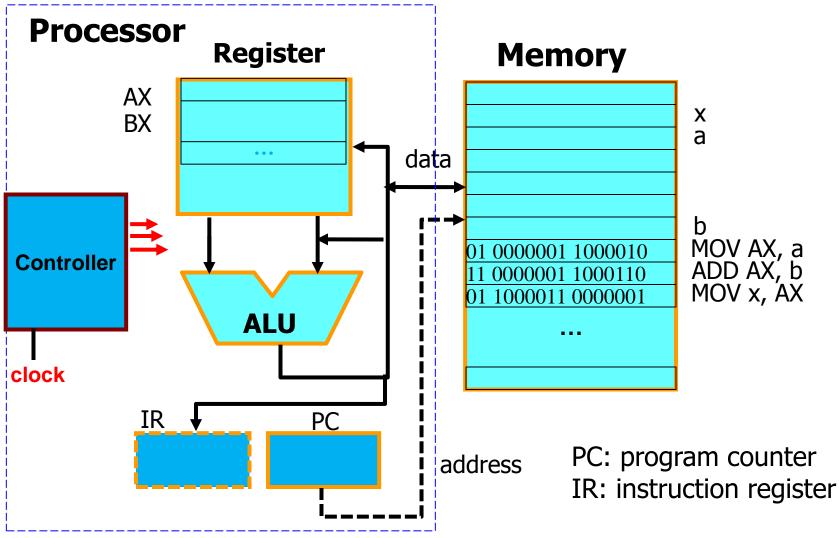
# FSM Representing the Program



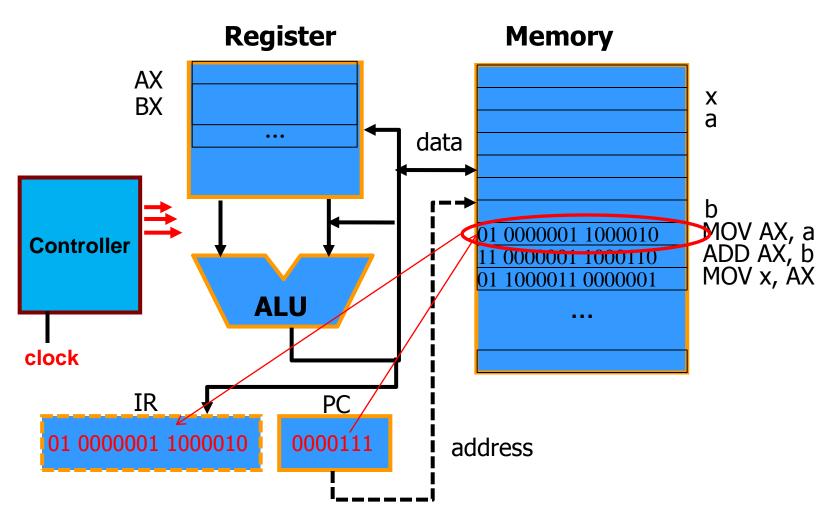
# Compare with Flow Chart



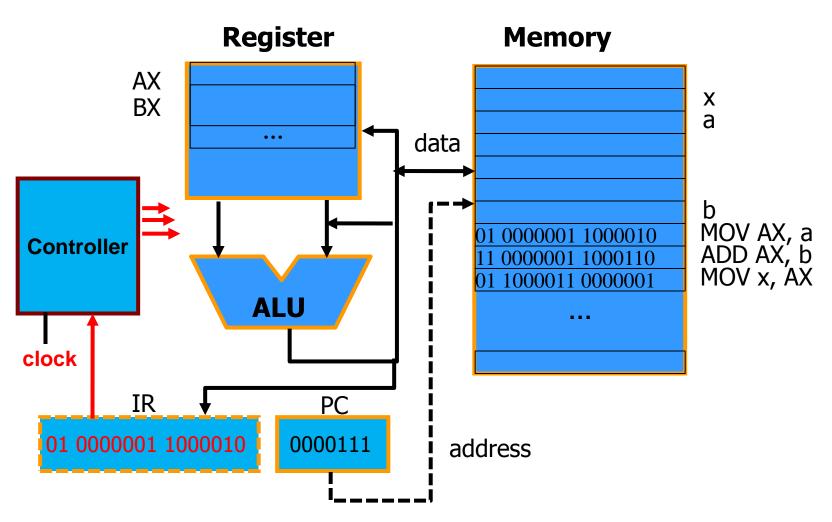
#### **FSM**



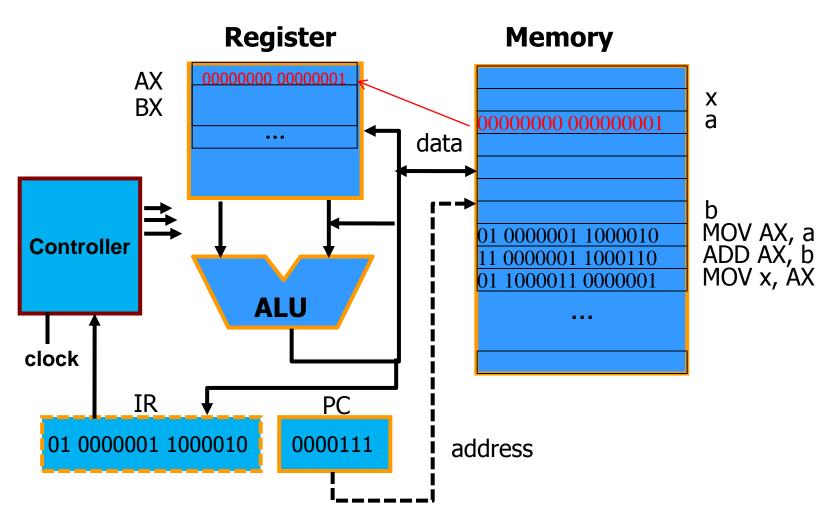
# Step 1: Fetch (MOV AX, a)



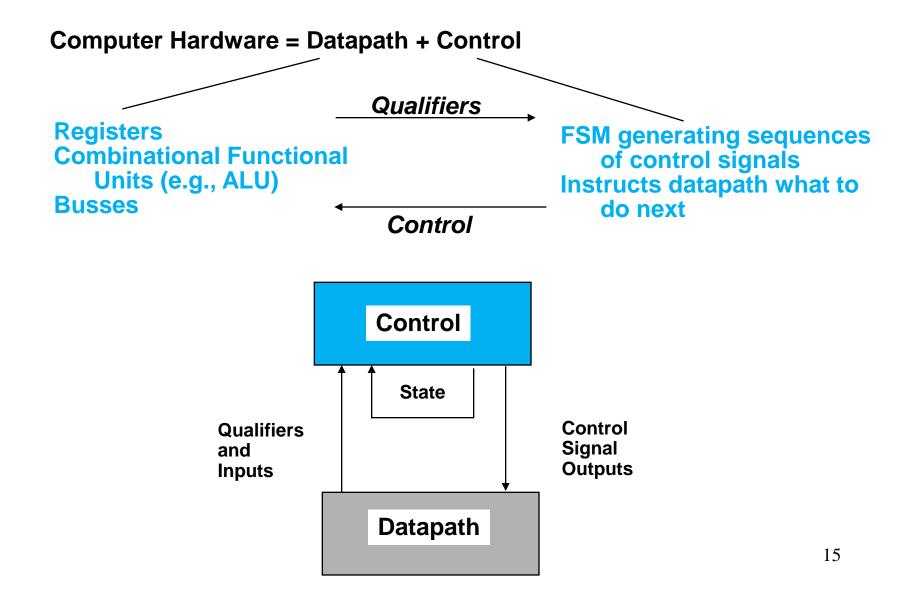
## Step 2: Decode (MOV AX,a)



## Step 3: Execute (MOV AX,a)

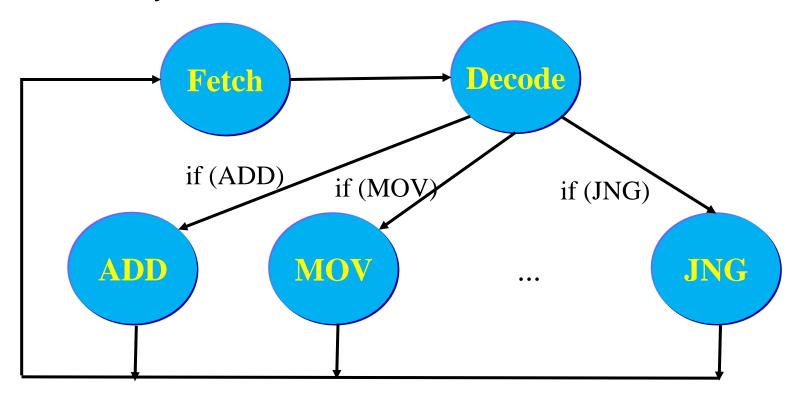


## Concept of the State Machine



## FSM of the Computer

 For this highly simplified computer, the controller can be described by a FSM



Each state will generate certain control signals to control the datapath 16