Recitation Guide for April 14th, 2008

I. Housing Keeping
    a. Quiz 4 – in class Friday April 18th
    b. Homework 8 – due Friday April 25th
    c. Will try to have exam 2s graded this week.
    d. All homeworks HW1 – HW5 should be graded. If not, talk to your grading TA.

II. State Machines
    a. A state machine is composed of an initial or starting state, new states, transitions between states and some cases ending states. State machines are usually represented with state diagrams.

    General state diagram:
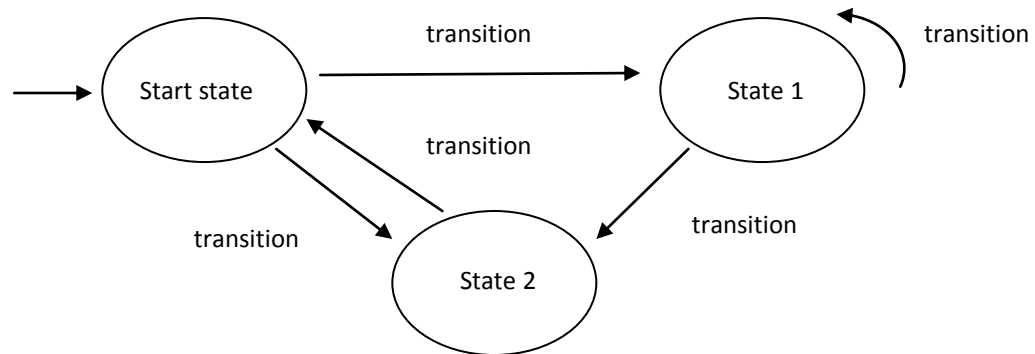
    The start state is indicated by an arrow that does not originate from a state. You cannot switch to a different state without a transition. It is a possible to have a transition back to the current state

    b. Consider the WolfDeerSimulation:
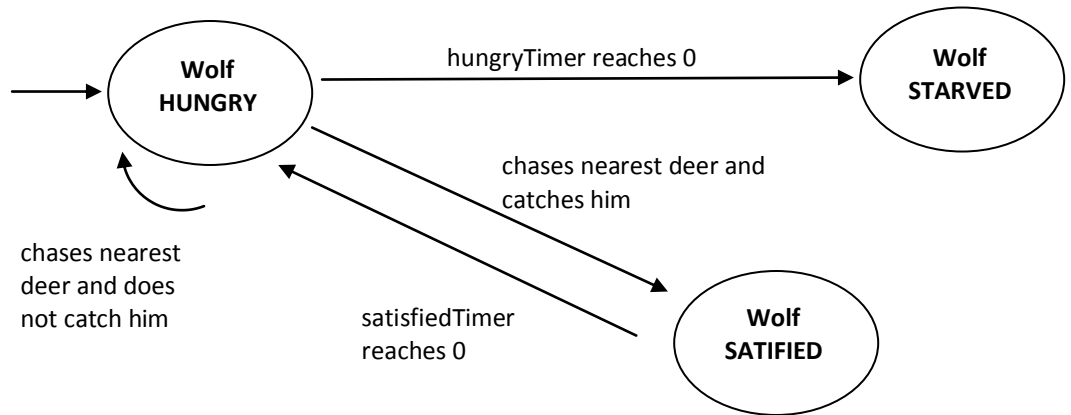   i. Wolf states
            1. HUNGRY – The wolf is hungry and wants food
            2. SATISFIED – The wolf is not hungry
            3. STARVED – The wolf has starved and is now dead
        ii. Wolf Transitions
            1. If in HUNGRY state and hungryTimer reaches 0, the wolf will become STARVED.
            2. If in SATIFIED state and satisifedTimer reaches 0, the wolf will become HUNGRY
            3. If in HUNGRY state, the wolf will try to chase the nearest deer. If the wolf catches and eats the deer, the wolf will become SATISIFIED. If the wolf does not catch the deer, he will stay HUNGRY.

iii. Wolf state diagram:

iv. Deer states
   1. HUNGRY – The deer is hungry and wants food
   2. SATISFIED – The deer is not hungry
   3. STARVED – The deer has starved and is now dead
   4. SCARED – A wolf is too close to the deer

v. Deer transitions
   1. If a wolf is too close to the deer, the deer will become SCARED.
   2. If in SATIFIED state and satisifedTimer reaches 0, the deer will become HUNGRY.
   3. If in HUNGRY state, the deer will look for corn. If deer finds and eats corn, he will be SATSFIED.
   4. If the hungryTimer reaches 0 before the deer finds corn, he will become STARVED.
   5. If the deer escapes from the wolf, the deer returns to its old state based on the hungryTimer and satisifedTimer.

vi. Deer state diagram
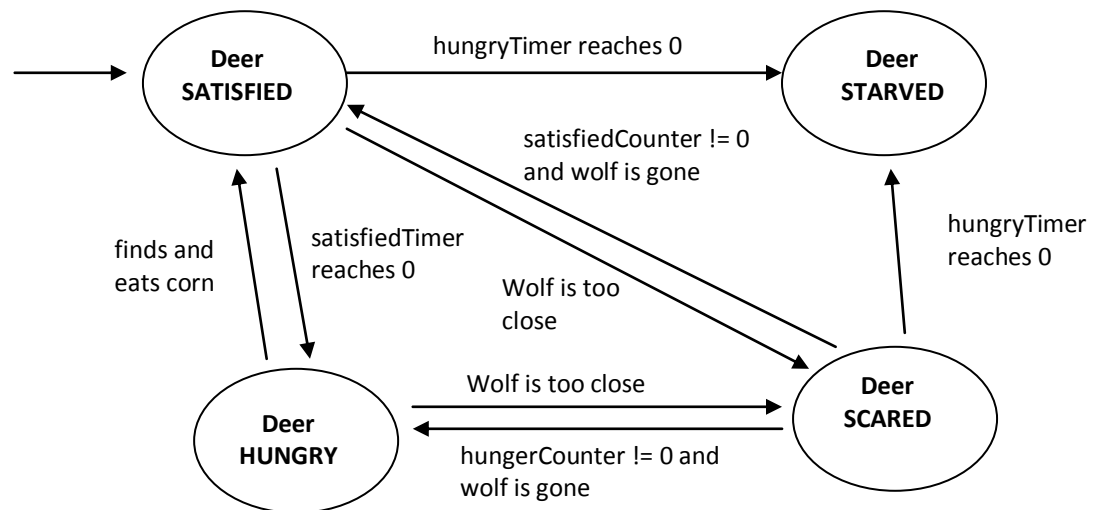
Does this diagram enforce precedence? The instinct to run away from a wolf is strong than the instinct to eat when hungry. Does the diagram show this?

c. Practice: Coke Machine
A coke machine is defined by the following rules:

1. start -> ready
2. ready -> not enough (coin)
3. not enough -> return change (coin return)
4. ready -> enough (coin)
5. not enough -> enough (coin)
6. enough -> dispense (drink selected)
7. dispense -> return change
8. dispense -> ready (done)
9. return change -> ready (done)

Draw the state diagram for the coke machine:

III. Go over Pre-Quiz 4
IV. Go over Exam 3 solutions