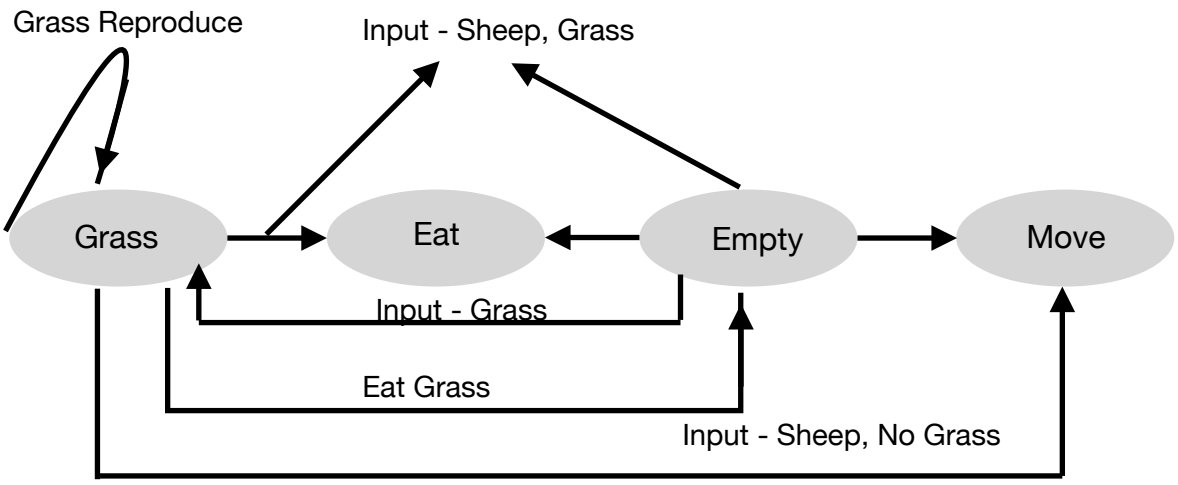
Predator Prey - Sheep Grass Cell Space



Variables Used:

sheepMoveT (Sheepmovetime) - Time after which the sheep will move to a neighboring cell.

sheepLifeT (Sheeplifetime)- Time after which sheep will die if the sheep doesn't eat grass.

sheepReproduceT (Sheepreproducetime) - Time after which the sheep will reproduce in the adjacent neighboring cell.

grassReproduceT (Grassreproducetime)- Time taken to reproduce grass in adjacent neighboring cell.

Testcase - To switch between the test scenarios.

Conditions:

- Grass - If there is no adjacent cell for grass to reproduce, No grass reproduction.
- Sheep - If there is no grass in the randomly selected adjacent cell, go to empty cell.
- Sheep - 2 sheep cannot move to same cell. If there are sheep in all 8 adjacent cells, move fails.
- Once sheep moves to cell, grass is immediately consumed.
- If sheep fails to eat grass for sheepLifeT, then the sheep dies.

Phases:

Grass, Grassreproduce, Sheep, Sheepmove, Sheepreproduce, Sheepdie, Empty.

Initialize Function:

Based on test scenarios, we will initialize the cells and update the two dimensional cell array depending on the cell state.

External Transition Function:

In the external transition function, get the phase value from the input port. If the phase received is Grassreproduce, update the cell space with grass and reproduces new grass in the random adjacent cell. If the phase received is Sheepmove, move the sheep only if there is grass in the neighboring cell. If there is no grass (ie., empty), move the sheep to that cell. If the phase received is Sheepreproduce, update the cell space with sheep. Update the variables accordingly.

Internal Transition Function:

In the internal transition function, check the phase value. If it is Grass or Grassreproduce, reproduce the grass in the cell. If the phase is Sheep or Sheepproduce, consider the minimal time between Sheepmovetime, Sheeplifetime, Sheepreproducetime and update the cell with the least value. If the phase is Sheepdie or empty, make the cell empty. Update the variable values by reducing sigma from those.

Output Function:

If the phase is Grass, make the cell appear with green color. If the phase is Grassreproduce, draw the cell with green color and check for the empty adjacent cell using cell phase array and send the message to neighboring cell. If the phase is Sheep, make the cell appear with red color. If the current phase is Sheepmove then check for neighbouring cell with grass or empty cell if there are no grass cells around, then we will move the sheep to that cell by sending the message to the neighbouring cell. If the phase is Sheepdie,make the cell empty. If the phase is Sheepreproduce then check for the empty neighbour cell and send message to change the state as sheep, if there is no empty cell it will do nothing.