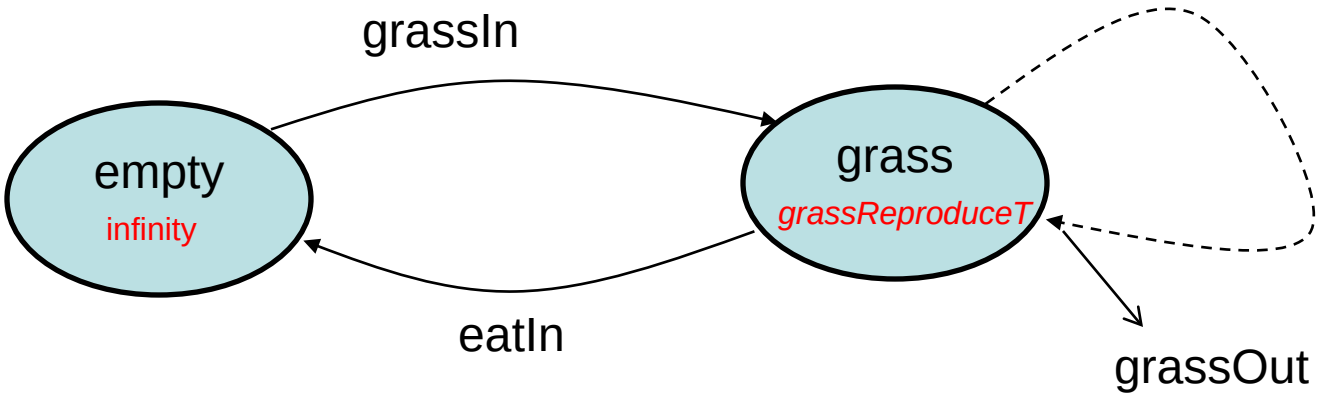
Homework 2 Discussion

Empty and Grass Cell

What events can an “empty” cell schedule?
Nothing
holdIn(“empty”, infinity)

What events can a “grass” cell schedule?
Reproduce grass
holdIn(“grass”, *grassReproduceT*)



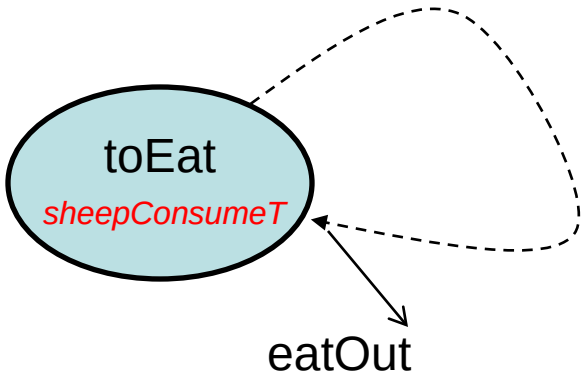
Sheep

What events can a “sheep” cell schedule?
Eat, move, die, reproduce sheep

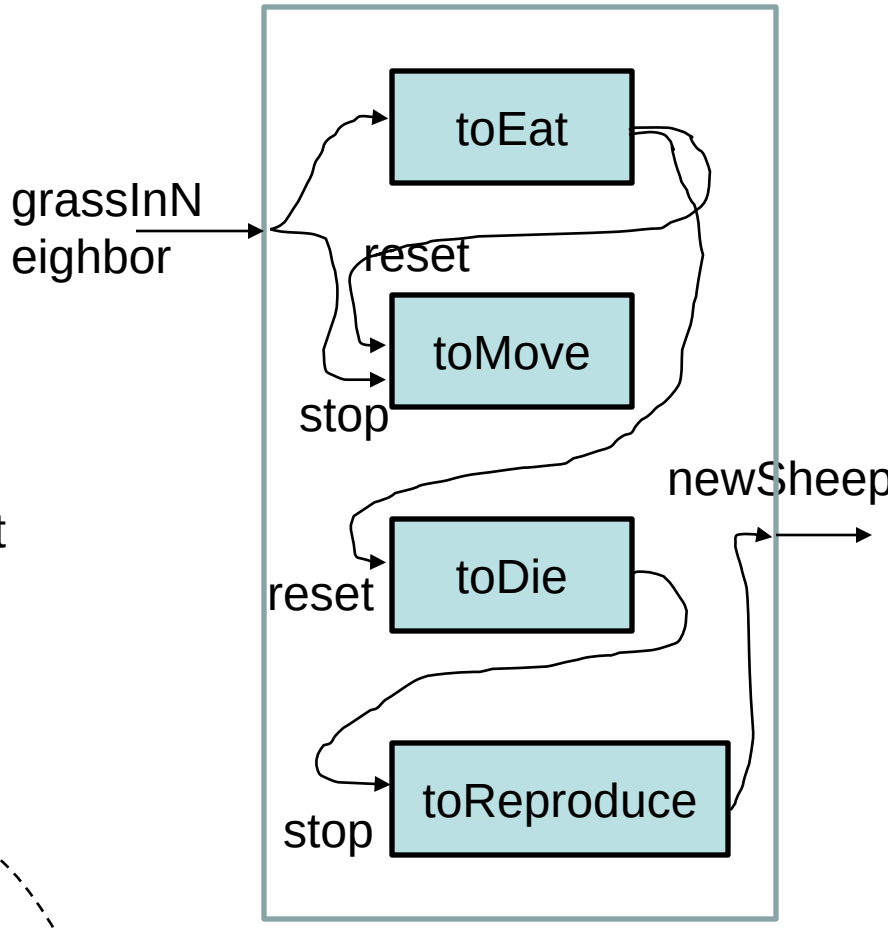
Note the elapse time for these events overlaps. For example, when a sheep moves, the elapse time for “die” and “reproduce” increases too. In other words, the sheep needs to schedule multiple “current” events at the same time.

A DEVS atomic model is allowed to be at one and only one state at any time point.

How to model this?



Sheep Coupled Model



How to represent that using states?

Define four remaining time variables and their initial values:

toEatTime = *sheepConsumeT or infinity based on if there is grass around*

toMoveTime = *sheepMoveT* or infinity based on if there is grass around

toDieTime = *sheepLifeT*

toReproduceTime = *sheepReproduceT*

In deltext() and deltint() update the remaining time correspondingly (Need to understand sigma and e).

For example, in deltint(), after eating,

toEatTime = *infinity* *// because grass has been eaten*

toMoveTime = *sheepMoveT* *// need to move because there is no grass*

toDieTime = *sheepLifeT* *// reset toDieTime because just finish eating*

toReproduceTime = toReproduceTime

– sigma (or toEatTime) *// decrease by toEatTime*

Then decide the next state based on smallest remaining time:

if(minimalTime ==toEatTime) holdIn(“toEat”, toEatTime)

else if(minimalTime == *toMoveTime*) holdIn(“toMove”, *toMoveTime*)

else if(minimalTime == toDieTime) holdIn(“toDie”, toDieTime)

else if(minimalTime == toReproduceTime) holdIn(“toReproduce”, toReproduceTime)

Sheep Moves

When a sheep moves form one cell to another, its *toDieTime* and to *toReproduceTime* is contained in the message passed from the source cell to the destination cell.

After that, the source cell becomes an empty cell.