Workshop on World Modeling・Workshop on Methods of Human Security Studies
2005 Summer Semester

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Lecture Four: Agents Can Make A Judgment! (May 17th)

●Outline

○Previous assignment（spin,drunk,skater）
○Variable Description
○Variable Type
○Assortments of "if" sentences
○Assignment

●Previous Assignment（spin,drunk,skater）

Seven students have responded.

●Variable Description（variables in the tree and in the rule）

At large there are two classes of variables. One would be「official」variables, as those displayed in the tree.「Speed」which was created in the previous lecture, would be one of them. The other would be the「temporary」variable which is defined in the rule. These are variables created in response to needs that arise in writing rules. They will not appear on the tree.

Official Variable：
This is defined in the tree. Variables where each respective agent needs to carry different values after its rule is executed.

Temporary Variable：
Variables that are defined by 「dim （name） as （type）」in the rule. After having used the variable in the rule, those variables that do not need to be stored, will be considered as temporary.★

Greatest difference:

「Official Variable」 Here, each agent(e.g. each red turtle)will store each value of each variable as permanent.

「Temporary Variable」 In this case, the value of a variable is determined solely for the agent being processed at that moment . This means that when it is the turn of the next agent to process, that value will be initialized.

Both variables have their features. A well-thought-out use of these variables is required. Keep in mind that written rules will apply to all the voluminous number of agents. If the value needs to be stored, set the variable inside the tree. If not, define it in the rule.

●Variable Type

All variables have a「Type」(They were established when the variables were created)There is the need to limit what type of value is to be taken beforehand. Most easy to image and typical are「Integer」or「Double」Other types of variables can be established as follows;

Type	Name	Content	Value
Pool	Booleam	True or false	True,False
Characters	String	Alphabets	Suzuki,Yamamoto
Whole Numbers	Integer	Whole numbers	365.1,2,3
Real Numbers	Double	Real numbers	3.145...,1.1415...
Space	Space	Space Name	space K, Town
Agent Type	AgtType	Aengt type	red turtle/blue turtle
Agent	Agt	Agent value	red turtle 01.red turtle 02
Agent set	AgtSet	Set of agents	{red turtle01,red turtle02},{red turtle00,red turtle01}

☆We will concentrate on the top four today.

☆As to threshold of values, refer to Help.

☆Either it be a variable in the tree or in the rule, it needs a type.

●if sentence

☆Basic **if** sentence 「if～～then,——do it」

```
if  [conditioning～～]  then
            [rule to be executed――]
end if
```

How to write a basic if sentence: This is used when the agent needs to make various judgments. Premise; This agent never becomes friends with a penniless person. Study his actions! This is how it is done by writing in these rules in the step (Agt_Step)

```
if  <friend's income = = 0>          then
                    <no match>
end if
```

Note of caution; Be careful in using ==. As I explained earlier, = indicates a substitution or replacement, so the indication of equals is==. (easily mistaken)

☆**if else** sentence 「if～～then,< 1 >do this.
If not,< 2 >do that」

```
if  [conditioning～～]  then
            [rule to be executed<1>]
else
            [rule to be executed<2>]
end if
```

☆**elseif** sentence 「if～ 1 ～then,< 1 >do this.
If not this and if～ 2 ～then,< 2 >do that.
If not,< 3 >do some other.」

```
if  [conditioning～1～]    then
            [rule to be executed<1>]
elseif  [conditioning～2～]          then
            [rule to be executed<2>]
else
            [rule to be executed<3>]
end if
```

●Assignment

☆Download＜Agenda Initial Model＞from Yamakage HP and write the following rules.
☆Initial model has space of 100*100, the Walkers start walking their ways from the center at a predetermined random speed and direction（maximum 5,minimum 0）.
☆There are no correct answers to these assignments. It is up to the creator of the model how it will appear. (The creator's sense? talent? Is at stake?)

（1）The Walkers who are too fast, slow down. The Walkers who are too slow, speed up.
Eventually all go at the same speed of「3」.
（2）Slow ones go clockwise. Fast ones go anti-clockwise.
（3）At 10% probability,your direction and speed is re-determined at random.
（4）Some Walkers go in circles against the wall of space.
（5）The direction of walk is determined（for example 45°）At first the walk is unsettled but gradually it takes the determined direction.
（6）The direction to be taken by each is determined（it is randomly set）At first, all walk is separate directions but gradually each starts to walk in the determined「own」direction that it is meant to take.
（7）Walker that start walking and head towards the closest of the four corners of the space.
（8）When hitting the space wall and changing directions, Walkers that try not to make a loop
（9）Walkers that take the determined route at the fastest speed.