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

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Lecture Five: Agent Looks Around! (May 24th)

●Outline

○Previous Assignment
○Variable Type（Agt, AgtSet）
○Agent Set Function
○Assignment

●Previous Assignment

Four students presented.

● Review Last Lecture

☆Variable Class

Keep in mind there are two classes of variables.「Official 」variables that are displayed in the tree.「Temporary」variables that are established in the rule.

☆Variable Type

Variables always have a type. Be sure to determine the type of value beforehand.

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}

☆Conditioning Sentence

Basic **if** sentence 「if～～then,—— do this」

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

●Explanation of the Initial Model and Today's Work

The initial model I want you to download today from the HP is about a Walker hurrying home. The homes of Walkers A are east（Direction0）The homes of Walkers B are west（Direction180）Each walker has a destination to return to（Destination）Even if the direction taken is different, they will eventually move towards the direction of their homes.

In previous models, we have created agents that did make judgments but their judgments were self-centered. There was no exchange with the outside world. This time we will acquire several new grammar language and learn how to be a part of the world that surrounds us.

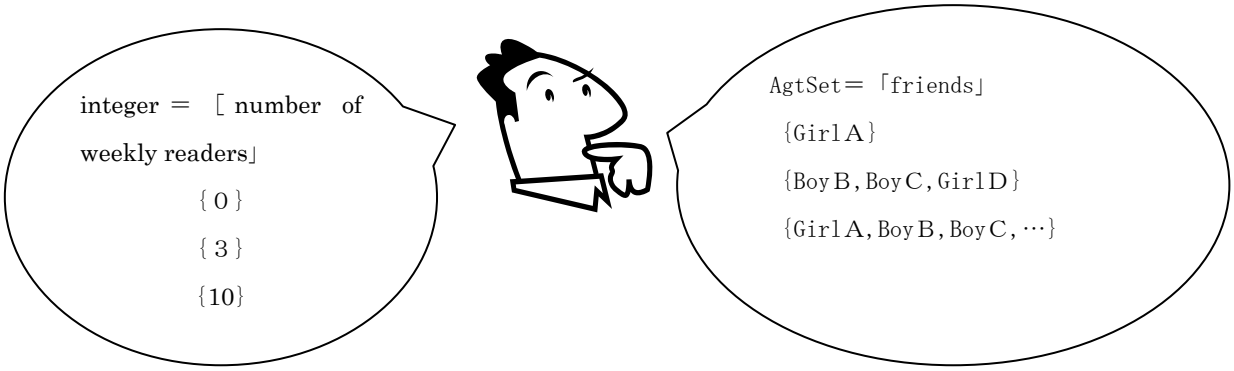
Specifically, let's create a Walker model that avoids being hit by another Walker that is coming close and toward it.

●Agent Set (AgtSet)

We talked about the types of variables last time. Numbers are stored in types for whole numbers (Integer) and real numbers (Double). Letters are stored in String. This time we will learn about AgtSet variables.

☆ AgtSet Variables

This variable can store a set of agents. A bit confusing but…let's say integer variables took numbers 1 or 2.The variable of AgtSet takes value of set of agents.



＞Choose「AgtSet」to define in tree

（＞In order to define in rule,Dim ＜name of variable＞ As AgtSet ）

★Now establish AgtSet variable named「(Neighbors)」for Walker A.

●AgtSet Function

In KK-MAS, there are numerous rules (function) to operate AgtSet variables. (Refer to help) Each one of these tools are helpful but let me show you two of these.

☆**MakeOneAgtSetAroundOwn** Be aware of what surrounds you!

This is a function that stores a list of an agent's surroundings (within the coverage of its vision) the axis of oneself in the AgtSet variable. This is how you would write it in. Four conditions are established. (＝This would be argument)

MakeOneAgtSetAroundOwn(AgtSet variable, Scope, AgentCategory, Is self included or not)

Ex. MakeOneAgtSetAroundOwn(My.Neighbors, 1, Universe.Space_K.Walker, False)

★Now write in the rule that stores those that came within a distance of less than one among the Walkers (B incase of A) that came walking to the AgtSet (Neighbors) variables which were established just now.

☆**CountAgtSet** Count

This is a function that counts the number of agents stored inside the AgtSet variable. This is how it works .One condition is established.

CountAgtSet(AgtSet variable)

Ex. My.Num_Neighbors = CountAgtSet(My.Neighbors)

★Now let's write in the rules that makes it possible for walkers to count the number of neighbors coming close.

★Let's check it out. (Method of information output)

●Complete the Model

（１）Write in the rule that makes the Walker turn right by 20 degrees if there is even one neighbor.

（２）Write in the same rule for the Walker B heading west.

（☆）With this, the model is complete. What will happen?

（☆）Local interactive exchange (bottom-up)

（☆)Motive of the agent （micro-motives） and the behavior of the system. (macro-behavior)

（３）What will happen if the Walkers turn just 10 degrees?

（４）What will happen if only the Walkers heading west turn just 10 degrees.