Workshop on World Modeling・Workshop on Methods of Human Security Studies
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Lecture Eight: Selecting Agents (June 14th)

Today's Target:

Let's learn how to distinguish "the others" that you have selected. Furthermore, we will learn the method of selection in detail. Based on the information on the types and distance of the subjects under scrutiny, you will be able to choose just those that fall under your specific stipulations. With this, you can select trucks and passenger cars for ticketing parking offense from all the vehicles on the streets, such as; trucks, cars, bicycles, and pedestrians. This is a method of selecting between, near or far, allies or enemies.

●Drawing lines between agents

If you have created an AgtSet variable right below the agent, a line (arrow) can be drawn for each agent of the set on the two dimensional map. If you want to draw numerous types of lines, what you need to do is to create that many AgtSet variables and add that many display lists. In displaying numerous lines and agents, use an arrow on the right of the map element list to indicate which comes above or below.

Example ①

Now let's follow the procedure to make this condition:「myriad of agents scattered in space are connected by lines」Let's create the model again.

・We'll make a Space of 50×50 (dead end) and one type of agent (for example, five nattou)

・ With Univ_init of Universe, agents will be randomly allotted.

```
Univ_Init{
dim hachi as agtset                    ← Require AgtSet variable
MakeAgtSet(hachi, Universe.jutan.nattou) ← All nattou are stored in hachi
randomputagtset(hachi)                 ← Contents of hachi are scattered around
}
```

・ We will create one AgtSet variable right under the agent in the tree.
・ Using the agent rule we will store the agents of the same type in this AgtSet variable.

```
Agt_Step{
MakeAgtSet(my.HokaNoTubu, Universe.Jutan.nattou)
}
```

・ Add map output with「Set>Output Setting」We will add a map element list to the agent. By clicking「Delineate」,we can program the subject to have lines and select the type of line or arrow and the color. Now let's include the previously-made AgtSet variable as the subject of delineation. The setting is completed by simply pressing「OK」 It's a "piece of cake."

```
# If AgtSet variable is not right below the selected agent,
#  「Delineation」can not be selected.
```

● Selecting Agents

We have learnt the functions; MakeAgtSet() and MakeAllAgtSetAroundOwn(). Here I will explain the methods of selecting those that apply to specified conditions, by adding to and subtracting from AgtSet variable that was created by these functions. At present, the functions that can be used for these operations are listed below.

・ ClearAgtset(a)	empty set a.
・ CopyAgtset(a, b)	copy set a in set b.
・ DelAgtset(a, b)	delete elements included in set b from set a.
・ JoinAgtset(a, b)	add set b to set a(duplication allowed)
・ MergeAgtset(a, b)	add set b to set a(duplication not allowed)
・ PurifyAgtset(a, b)	of set b, those that do not duplicate is put in set a.
・ MakeDiffAgtset(a, b, c)	put in set a those that appear both in set b and set c.
・ MakeCommonAgtset(a, b, c)	put in set a those that appear in one of the sets b or c.

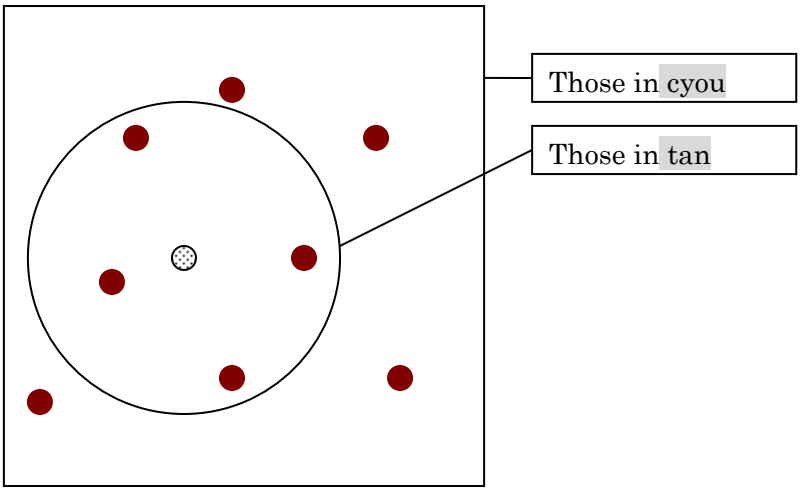
You don't need to memorize any of this. Just remember that things like this exist. That will do. When the need arises refer to Help. Now let's see an actual case in use.

Example ②

We will use the model created in Example ①.Let's make the model.「There are 20 or so agents. They are connected by lines. If the distance is within 20, the lines are dark brown. If there are more, the lines are light green」

・Make two cyou, tan AgtSet variables right under nattou

```
Agt_Step{
MakeAgtset(my.cyou, Universe.Jutan.nattou) ←store all nattou.
MakeOneAgtsetAroundOwn(my.tan, 20, Universe.Jutan.nattou, true)
        ↑ store only nattou with distance within 20.
DelAgtSet(my.cyou, my.tan)
        ↑ delete nattou of distance within 20 from the total set.
}
```



・Set output to make lines. Because there are two lines, two element lists must be made. If that works, now try to change the order of the lists.

・ At first take a random direction, and take steps, one at a time. With the change in distance, notice the change in color of the line.

●Assignment

・ Create a new model. Place one thousand agents at random within a space of 50×50.Create one separate agent and place it in the center of the space.

① Draw a line to separate agents within the range of 8 from the agent in the center.

② Use each of these; MakeOneAgtsetAroundOwn and MakeOneAgtsetAroundOwnCell

③ Set the range to gradually widen from 0 to 24,and return to 0 again.

④ Save the models under a separate name. This will make it possible to freely operate

the range with the control panel.

⑤ With the above model, let's try to make half the range a different color.

⑥ (If this is "piece of cake" for you) Play with the distance to be within range, within 2/3 of this, within 1/3 of this, and so forth. Make the line color darken in three shades.