Overview: In Part I of this project, the chaser agent simply moved around randomly on the ground. In this next phase of the design, the chaser will intelligently seek the traveler agent using a computational thinking pattern called “hill climbing.” Imagine the traveler agent emits a scent. Hill climbing is an algorithm to find the direction in which the scent is strongest. The scent will be propagated by the ground agents using a computational thinking pattern called “diffusion.” Diffusion is a fundamental physical process by which matter moves down a gradient from highest to lowest concentrations. The closer to the source of the scent, the greater its amplitude. This project will use a simplified form of the discrete diffusion equation. This phase of the project introduces the concept of an “agent attribute,” which is unique information that is stored within each occurrence of an agent. The typical computer science term is called a local variable. The ground agent will have the behavior below; the single action is to calculate and store the average of the four surrounding agents’ agent attributes. We have given the arbitrary name of the agent attribute “s” (for scent).

Ground agent has behavior:

The “set” action sets each ground agent’s attribute “s” to the average of the attributes in the agents above, below, and on each side:

$$s = 0.25*(s_{\text{up}}+s_{\text{down}}+s_{\text{right}}+s_{\text{left}})$$
Traveler behavior: **give the traveler a scent**: Add a rule to set the traveler’s agent attribute, “s”. Note the placement of this unconditional rule.

(Note: This is only a partial view of the traveler’s behavior. Refer to the first phase of the Journey project to see all the rules that precede the final one in the list.)
**Chaser revised behavior:** Chaser examines agent attributes of surrounding cells to determine which direction to move. Note the use of a method to make the decision. The figure below shows rules for the first two directions. The subsequent figure shows the entire behavior.
Chaser full behavior:
Agent attributes in ground cells allow chaser to determine next move using hill climbing computational thinking pattern:

Value of agent attribute “s” (‘scent’ of the traveler) in the cell above of chaser:
Value of agent attribute “s” (‘scent’ of the traveler) in the cell to the left of chaser:
Value of agent attribute “s” (‘scent’ of the traveler) in the cell to the right of chaser:
Cell below the chaser has largest value of agent attribute “s” (‘scent’ of the traveler):
Note that conversational programming color indicates chaser’s next move will be down.