Additional Topics for Troubleshooting and Debugging

Tips, anomalies, ‘features’, quirks ,et al ...

Missing methods -- inadvertent renaming of "while running": It is not uncommon for a student to accidentally rename the “while running” method. This, unfortunately, is not difficult to do because selecting the method type makes it easy to change and the change may go unnoticed.

Differences between AC-O and AC-D: There are several differences between AC-O and AC-D, some of which are enhancements in AC-O that do not apply to AC-D, such as increased precision in arithmetic calculations and the ability to play MIDI musical sounds. There are some features, however, in AC-D that have not been ported to AC-O. One example is the internal coordinate position attributes (self.row, self.column, self.layer), which exist in AC-D but not in AC-O. Reference to these in AC-O will not cause an error; however, the value returned will always be zero.

Plot Window limited to 6 variables: If you specify more than six variables among plot-to-window actions, only the first six will be plotted and tracked, even though additional variables are listed in the window; no error or warning is issued.

Key queuing anomaly: If an agent (e.g., frog) responds to key conditions and if it is erased and regenerated (by a generating agent), and if the player has entered keystrokes quickly, there may still be keystrokes in the queue to be examined by all agents when the new agent is generated. As a consequence, the new agent will then "see" the keystrokes. To mitigate this, use a Wait action between erasing the original agent and creating the new agent. This allows time for key queue to drain.

Switch-to-world anomaly: This is similar to the key queuing anomaly. If an agent switches to another world and the current simulation cycle has not yet completed for all other agents, the cycle may complete in the switched-to world. This can result in unexpected agents appearing in the destination world if an agent in the sending world was generating an agent as the switch occurred.

Need for perceive-act: Especially in models with highly dense worlds in which collisions can "cascade" during a single simulation cycle, it may be necessary to implement the perceive-act computational thinking pattern in order for the model to operate in an expected way. A common example is a wildfire models with trees covering world nearly completely. Without implementing perceive-act using a monitor or controller agent driving the model, trees that are not next to a burning tree may “catch fire” in a single cycle. This is because of the sequential way in which agents are “polled” (processed) by the AgentCubes simulation engine. So, an agent that is next to a burning tree may catch fire; then, during the same simulation cycle, the next agent processed might be a tree next to the newly inflamed tree. Because the second agent processed would “see” a burning tree (the newly inflamed tree), the former may also catch fire. In a valid model, only trees immediately next to a burning tree could catch fire within the same simulation cycle. Using a monitor/controller agent and perceive-act methodology to control the
model, rather than allowing trees to independently make decisions in their “while running” methods, precludes this problem.

** Plot window not synchronized with simulation property or agent attribute.** The plot window runs asynchronous to the world window. Especially if plotting is done in a subordinate method or if simulation termination occurs in a subordinate method (vs. While Running), the plot window may be one simulation cycle "behind" the simulation property window. To ensure synchronization, ensure that simulation termination occurs in the While Running behavior of an agent.

** Browser refresh anomalies:** During agent shape editing and world construction, depending on the browser and the platform (e.g., Chromebook vs. Windows), the changes may not be reflected accurately in the world. Refreshing the browser window usually corrects this. Sometimes quitting and reloading the browser is needed.

** Switch to non-existent world:** If a designer creates a world, creates a rule to switch to that world, then deletes the world, the (now) non-existent world name will still appear in the switch-to-world action. As a consequence, if the rule with this action is invoked, an error will occur.

** Duplicate variable names:** There may appear in the variable list the same variable name with and without initial capitalization. This is primarily due to uploading an AC-D project. In such situations, AC-O may not recognize the desired variable. If multiple versions with and without capitalization are visible in the agent list, usually re-selecting or re-enter the variable name in the test or set action will ensure desired variable name is selected.

** Other outstanding issues:**

** 8-way (Moore) hill climbing fails to work properly.** Until this is resolved, using 4-way (Von Neuman) hill-climbing should be used.

** Variables with invalid characters (special characters, spaces):** Currently, AC-O permits defining or implicitly defining (in a set action or test condition) a variable name (agent attribute or simulation property) with spaces or invalid characters. However, subsequent attempts to reference the variables results in either zero being returned or an error. Take care when defining and referencing simulation properties and agent attributes to use only letters (first character must be a letter), numbers, and the underscore (“_”) character.

** Infix negative number sign is not supported.** AC-O will flag as an error certain expressions with a leading (infix) negative number sign (e.g., “-c + 6”) in a set action. Example acceptable alternative forms for such expressions are "0 - c + 6" and "-1 * c + 6".

** The multiline tool does not place agents when drawing beyond the boundaries of the world grid:** When using the multi-agent (rectangle) tool to place agents in a world, if the tool is dragged beyond the boundary of the world, no agents will be placed. Care must be taken to limit the area selected when using the tool to the world boundaries. (#2307)
**The “show-message” action second line not displayed:** Work is underway to resolve a problem with the Show-Message action and the Chrome Browser pop-up disabling option. Currently, the Show-Message does not display the secondary message line. Until/unless this problem is resolved, ensure that all information desired in a show-message statement is in the primary message line.