Problem:

I want to be able to write entity specific output information to an output data table at the end of the simulation run. **Simio Professional and RPS (Enterprise) edition only**

Categories:

Data Tables

Key Concepts:

Add-On Process, Assign Step, AddRow Step, Data Table, Output Table, Real State Variable, Run.TimeNow, State Assignments, String State Variable, Maximum Arrivals

Assumptions:

All data is added to the output table when the entity is about to leave the system. Both functions and state variable information is used to write the appropriate state information to the output table.

Technical Approach:

An output data table is utilized to write out information regarding an entity to a table at the end of the simulation run. The AddRow step is used to add a new row to the table with each entity leaving the system, while the Assign step will assign values to the various columns in the table for that given entity instance.

Details for Building the Model:

<u>Simple System Setup</u>

- Place a Source, two Servers and a Sink in the Facility window. Use paths to connect the Source to each of the Servers, and each of the Servers to the Sink.
- Within the Source, open the Stopping Conditions section and change the *Maximum Arrivals* property to '20'.
- Within the Run Setup section of the Run ribbon, change the *Ending Type* to 'Unspecified (Infinite)' so the simulation will stop when there are no more entities in the system.

<u>Defining an Entity State</u>

- Within the Navigation window, click on the ModelEntity. Go to the Definitions window, States panel and add a String state variable with the *Name* 'WhichServer'. This will be used to store (with the entity) which of the two servers it utilized. This state can be referenced as ModelEntity.WhichServer.
- Within the Navigation window, click on the Model and place a ModelEntity from the Project Library into the Facility window.

<u>Defining the Output Table</u>

- Still within the Model, open the Data window, select the Tables panel and add an Output Table.
- Still within the Data window, click on the States ribbon to add several states to the output table. First, add a Real state variable and change the *Name* to 'TimeEntered'. This will store the simulation time that the entity entered the system.
- Then, add a String state variable with the *Name* 'EntityName'. This will store the entity name, such as DefaultEntity.94.

- The next column added should be another Real state variable with the *Name* 'TimeLeaving' that will store the simulation time that the entity finished in the system.
- Finally, add another String state variable with the *Name* 'ServerName' that will indicate which of the two Servers through which the entity was processed.

Adding a Row to an Output Table During the Run

- Because output tables are tables with no data at the start of the simulation run, data must be added during the run through the use of object states. To add a row to an output table, the AddRow step is used.
- In the Facility window of the model, within the input node of the Sink (Input@Sink1), double click directly on the *Entered* add on process trigger so that it automatically creates a process within the Processes window named 'Input_Sink1_Entered'. This should reference the process from within the input node, as well as place you within the Processes window to begin defining the process.
- Within the process, add an AddRow step with a *Table Name* of 'OutputTable1'. Each time an entity goes through the Sink, a new row will be added to the output table.
- Next, add an Assign step and make the following assignments to the states in the table:
    - *State Variable Name* – 'OutputTable1.TimeEntered', *New Value* – 'ModelEntity.TimeCreated'
    - *State Variable Name* – 'OutputTable1.EntityName', *New Value* – 'ModelEntity.Name'
    - *State Variable Name* – 'OutputTable1.TimeLeaving', *New Value* – 'Run.TimeNow'
    - *State Variable Name* – 'OutputTable1.ServerName', *New Value* – 'ModelEntity.WhichServer'

Assigning the ModelEntity.WhichServer Value

- Within Server1, under the State Assignments section of properties, click on *On Entering* to enter an assignment through the repeating property editor. Assign the *State Variable Name* 'ModelEntity.WhichServer' to the *New Value* of 'Server1.Name'.
- Within Server2, do the same thing, except assign the *State Variable Name* 'ModelEntity.WhichServer' to the *New Value* of 'Server2.Name'.

Running the Model

- You will notice that the output table, while it has column headers, does not include any data. Once the simulation has been run, the output table will be filled with data upon clicking the Stop button.