

Chapter 6 – Advanced Process Panel

6.1 Modules

We will use Sample Model 2 in Figure 6.1 and Figure 6.4 to discuss both the Modules and Data Modules used from the Advanced Process panel in this course.

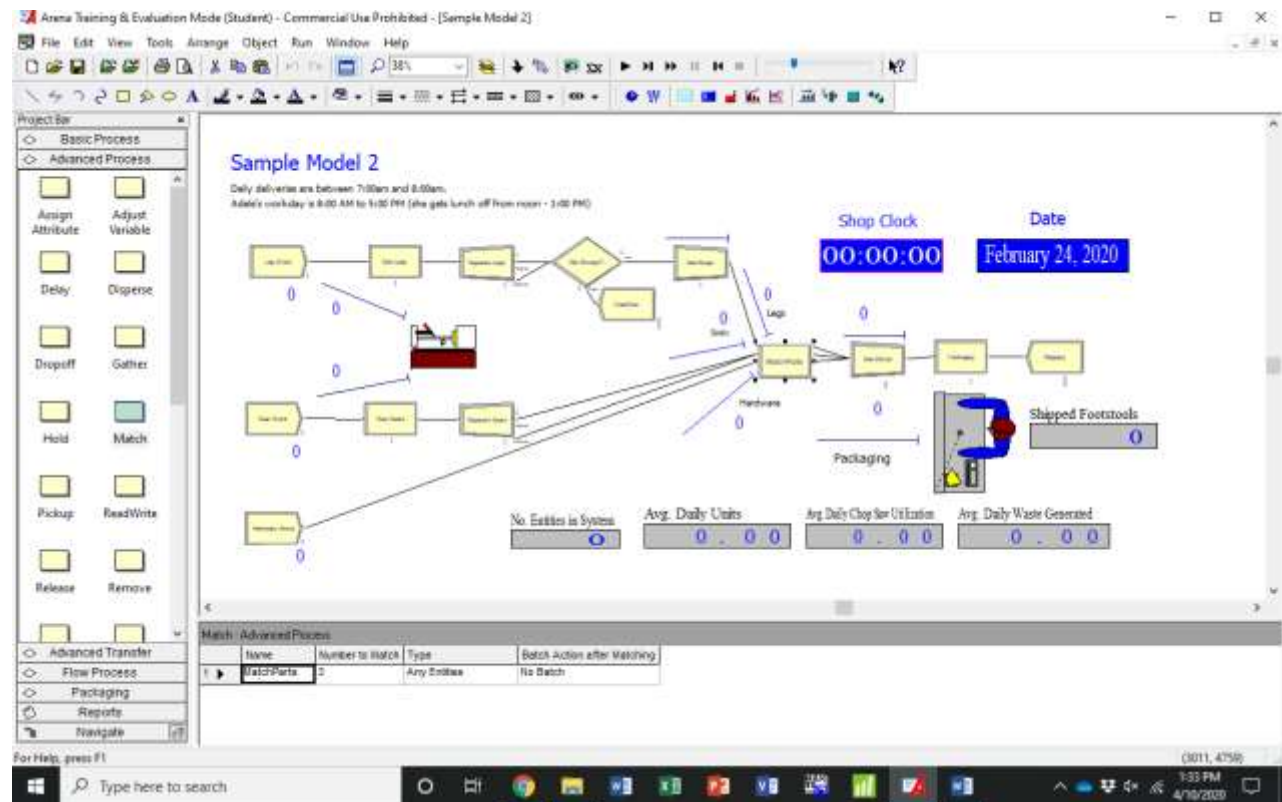


Figure 6.1. Sample Model 2.

6.1.1. The Match Flowchart Module

The Match module in Figure 6.2 matches different entities into a batch, or group.

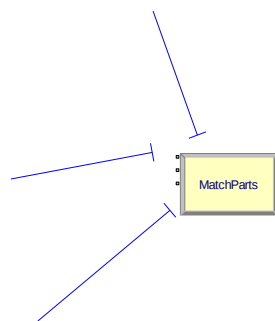


Figure 6.2. The Match module.

Double-click it to open the dialog box (see Figure 6.3).

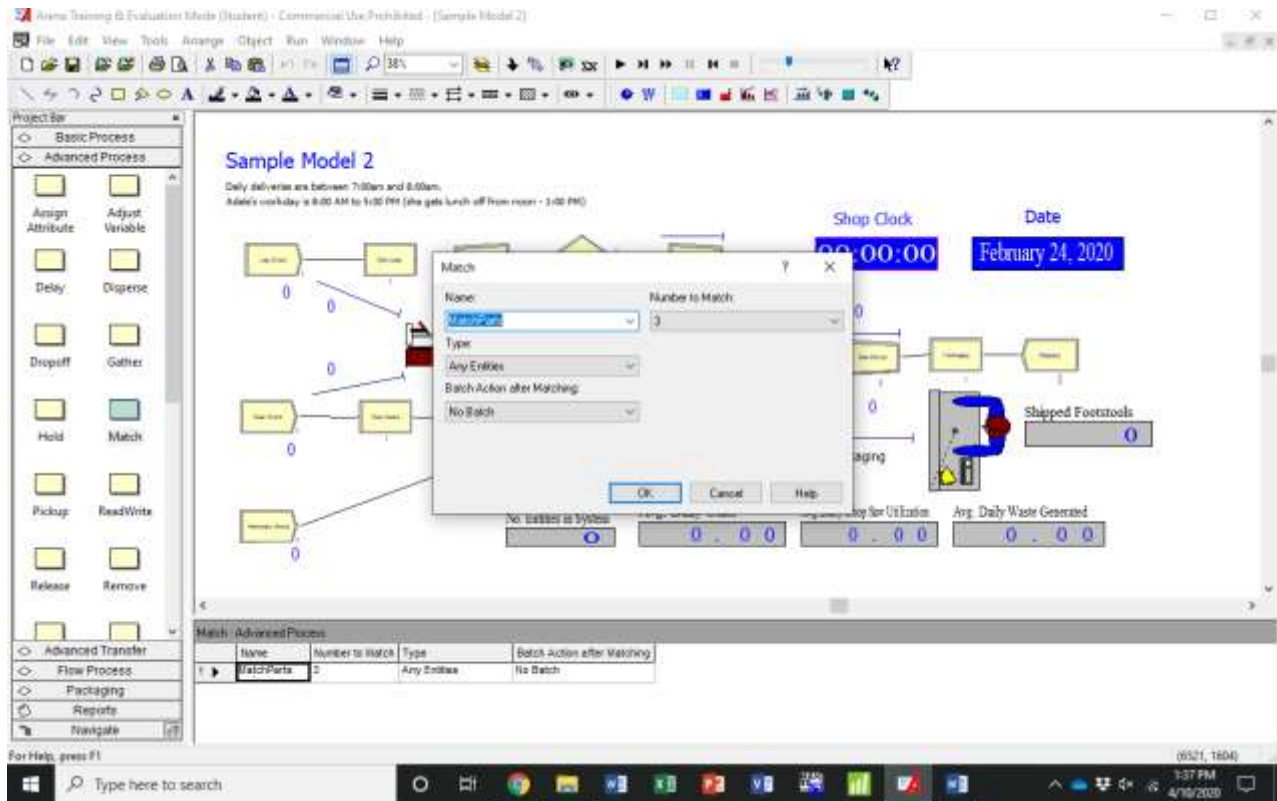


Figure 6.3. Dialog box for the Match module.

Simply enter a descriptive name in the Name field. This will become the label on the face of the Match module. In the Number to Match field, enter the number of different entities you want to match into a batch, or group. Arena will automatically generate the number of queue lines for the Match module that correspond to the number to match and you can click and drag each queue line where desired in the model. In the Type field, two options are given: Any Entities and Based on Attribute. Make the appropriate selection. In the Batch Action after Matching field, three options are given: No Batch, Temporary Batch, or Permanent Batch. These same options are given in the Batch module, which is added to the module sometime after the Match module is added. You can make the appropriate selection in either the Match or Batch modules.

6.2 Data Modules

Data modules define the characteristics of various process elements, such as entities, resources, and queues. They can also be used to set up variables and other types of numerical values and expressions that pertain to the entire model. The icons for data modules look like small spreadsheets in the Project Bar below the Modules section.

Data modules that we will use in this course for the Advanced Process panel include Failure to build in a failure mechanism that resembles a real-life production situation. Other panels contain different sets of data modules. Data modules exist “behind the scenes” and define different kinds of values, expressions, and conditions. To edit a data module, click on it in the Project Bar and it will automatically appear in the Spreadsheet view of the Model Window, below the Flowchart view. If the Flowchart view takes up the entire Model Window, move your cursor down to “grab” the top of the spreadsheet view and pull it up into view. Unlike Modules that may be used more than once in the Flowchart, there is only one of each type of data module in every model. Within each data module, however, there may be any number of rows that correspond to what is included in the model for that type of data module.

Flowchart and data modules in the model are related by the names for objects that they have in common, for example, queues, resources, entity types, and variables. Arena stores in memory the names of objects the analyst defines and then presents these names in a drop-down menu in the appropriate places in the flowchart and data modules. This helps the analyst to remember what you’ve named things and maintains consistency in the model development.

6.2.1 Failure Data Module

We will continue to use Sample Model 2 to discuss the Failure data module in the Advanced Process panel.

By clicking on the Failure data module in the Project Bar, the Station Data spreadsheet opens up at the bottom of the Model Window, as shown in Figure 6.4.

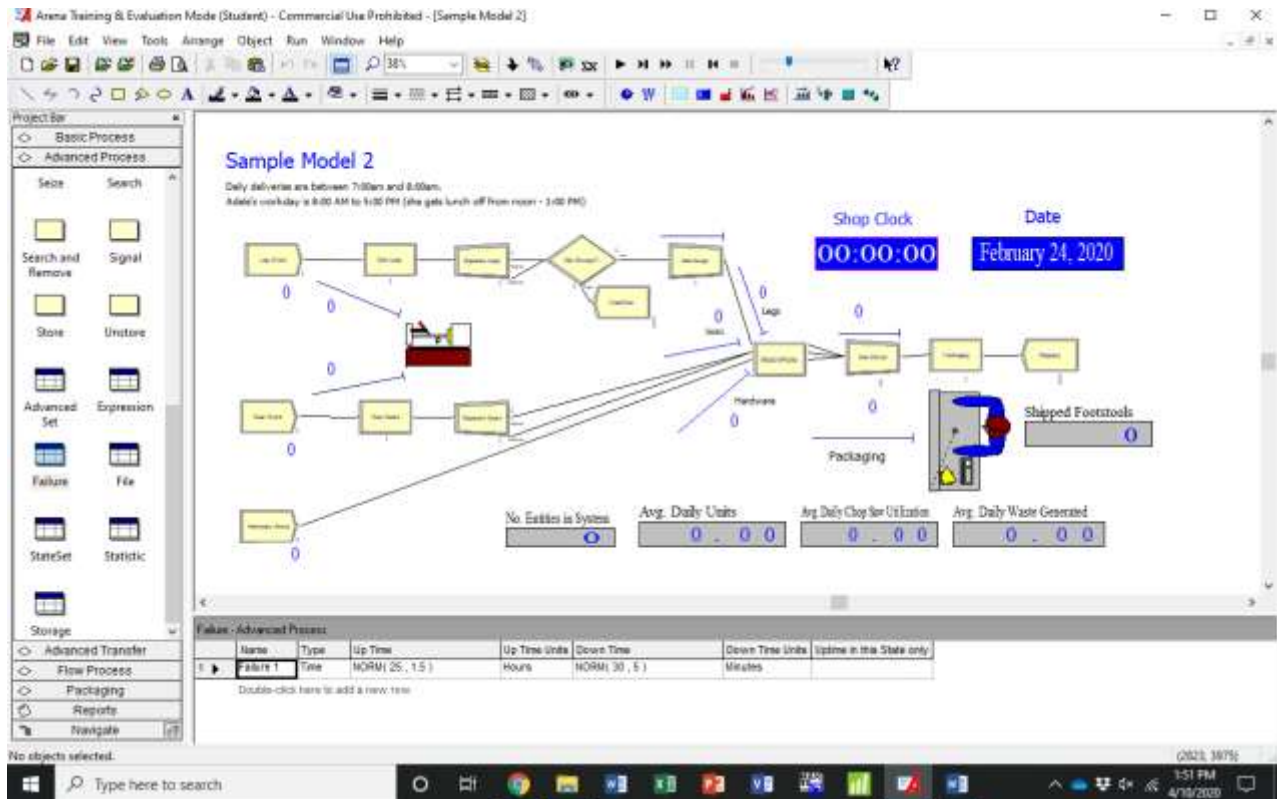


Figure 6.4. Spreadsheet view of the Failure data module.

In this example, we observe only one row in the Failure data module, but we can add as many failures as necessary to model a real production system. In the Name field, the Default name is Failure 1; however, the analyst can change this to a more descriptive name. In the Type field, there are two options: Count and Time. Count would be selected if the failure occurred after so many cycles or number of units processed. Time would be selected if failures occurred following a probability distribution or after a known run time period.

In the Up Time column, a drop-down menu provides many probability distributions, as shown in Figure 6.5.

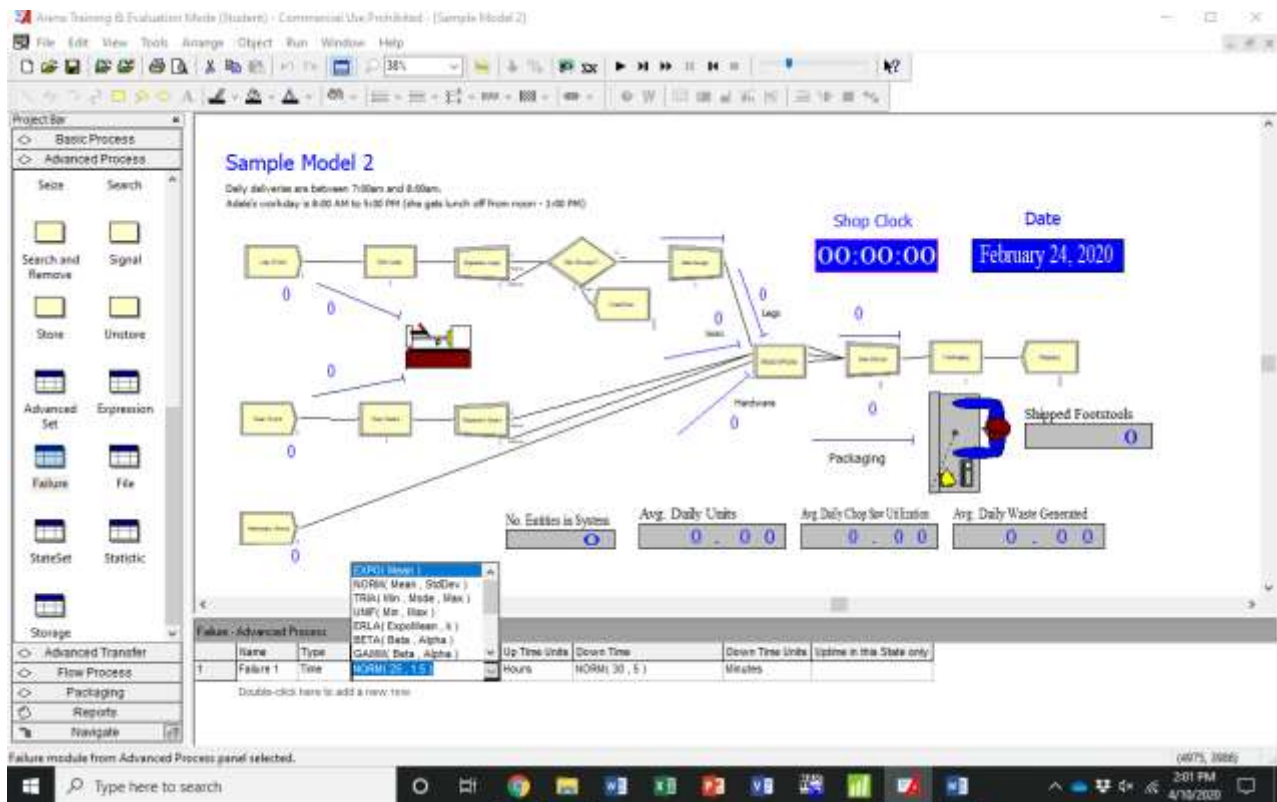


Figure 6.5. Drop-down menu for Up Time column in Failure data module.

The analyst would select the appropriate distribution and manually enter parameter values in the parentheses where indicated. In the Up Time Units column, make the appropriate selection from the options Seconds, Minutes, Hours, or Days.

In the Down Time column shown in Figure 6.6, the analyst would make the appropriate selection for the probability distribution and then manually enter parameter values in the parentheses where indicated. In the Down Time Units column, make the appropriate selection from the options Seconds, Minutes, Hours, or Days.

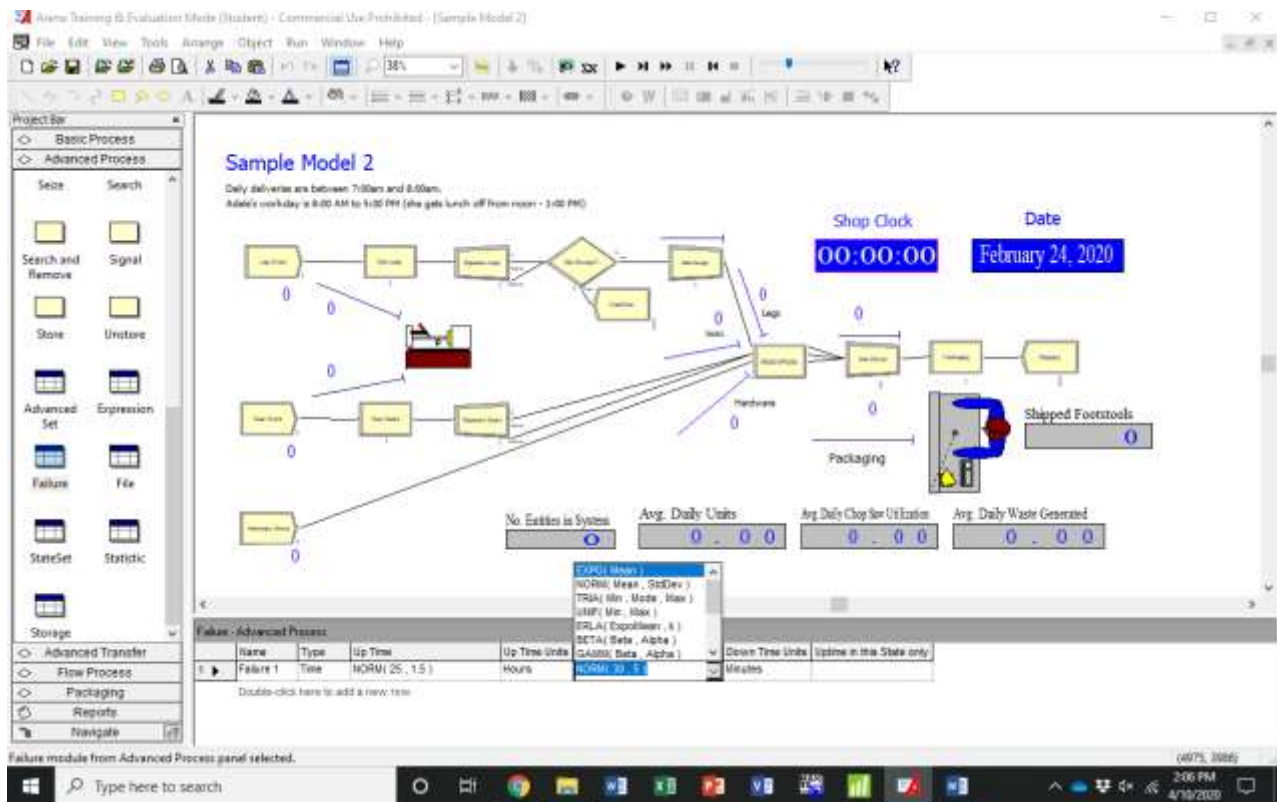


Figure 6.6. Drop-down menu for Down Time column in Failure data module.