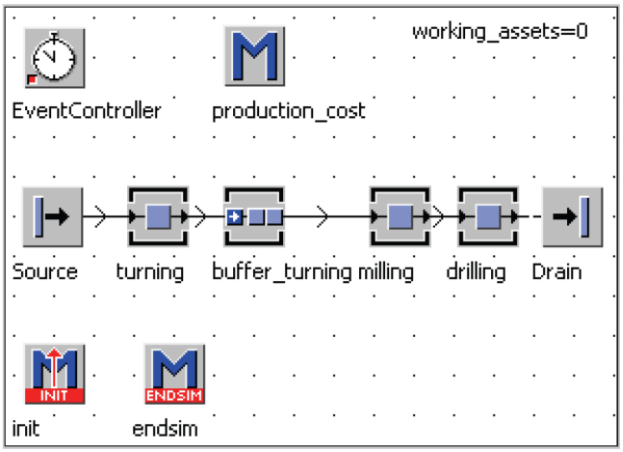
Part II: Intensive Programming

Simulation of Production Systems

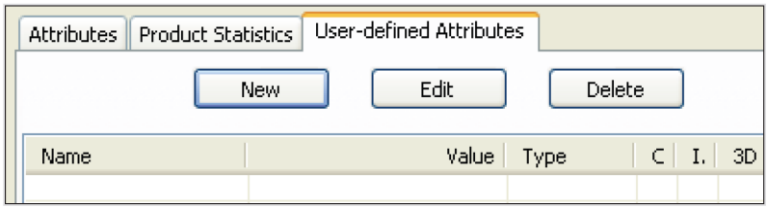
Production Costs and Working Assets

Create the following Frame:

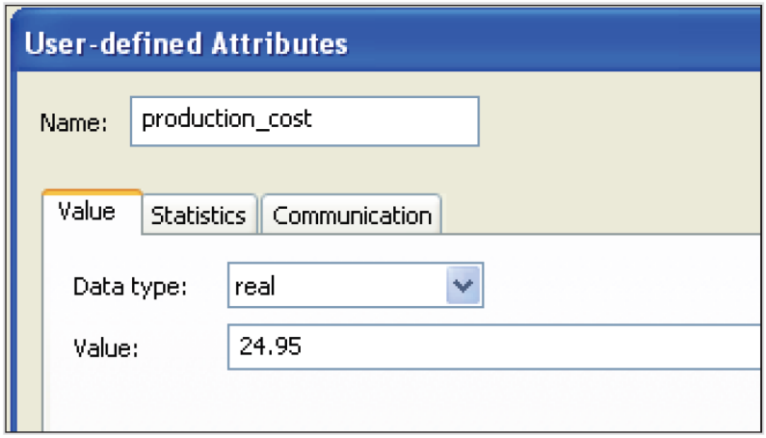


Material costs of unfinished part: €24.95, average manufacturing wage €/h36. First, the part is turned, then milled, and then drilled. Processing times: turning, milling, drilling 1 minute. The relevant entity (*Part*) is to have the property "production_cost" (data type *real*).

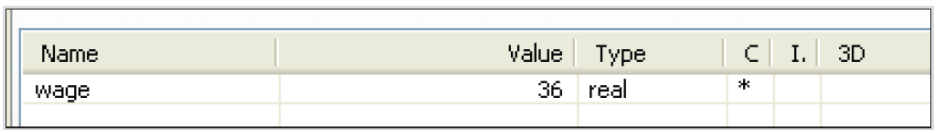
Procedure: Duplicate an entity. Rename it to "*part*". Open the entity by double-clicking it in the class library. Select *USER-DEFINED ATTRIBUTES – NEW*.



Enter the following values in the dialog:



The value of the attribute is initialized with the value of the raw material (at the beginning of processing). The machines need to have an attribute "wage", into which the hourly wage costs are entered.



The calculation of the production costs is relatively simple (e.g., exit control rear of the machines, method production_cost):

```
is

do

  @.production_cost:=

  @.production_cost+((?.procTime/3600)*(?.wage));

  -- procTime in seconds!

end;
```

Working Assets

To determine the working assets, you have to identify the existing entities and their cost (ideally within an *EndSim* method).

The values (costs) of the parts in the Frame are to be determined after the end of the simulation. For this purpose, you query the individual objects whether they are occupied or not. If they are occupied, then the costs of the parts are added to the global variable (*working_assets*).

The simulation runs for 24 hours without breaks.

Task 1: Program the endSim-Method to determine the working assets.

Task 2: Program the endSim-Method to determine all costs after the simulation runtime.