Universidad Zaragoza
1542

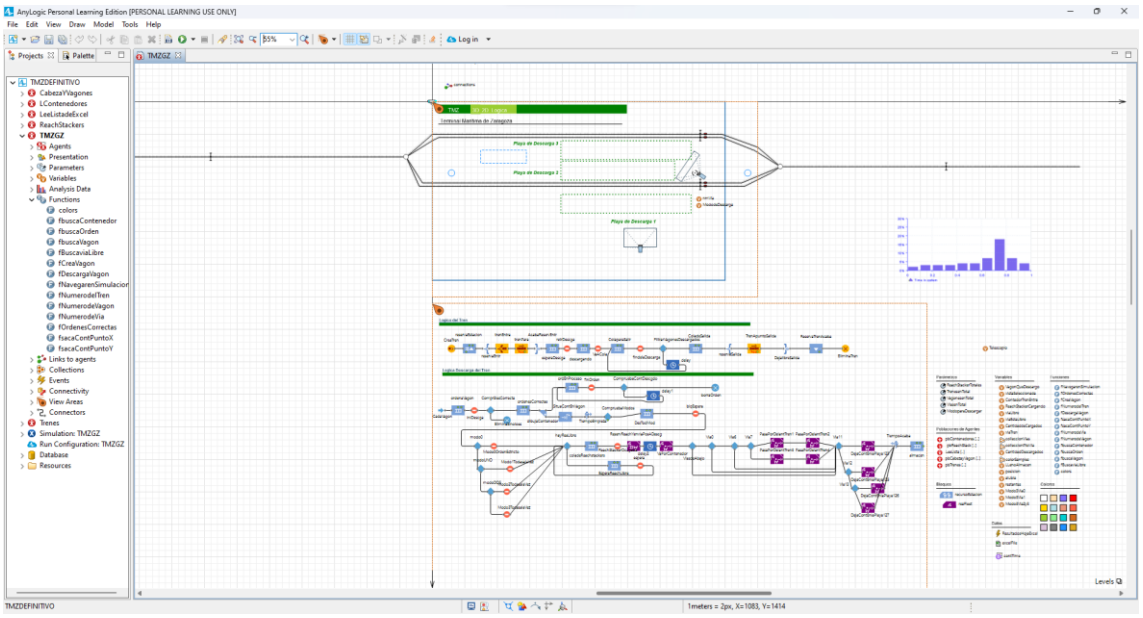
ANEXOS

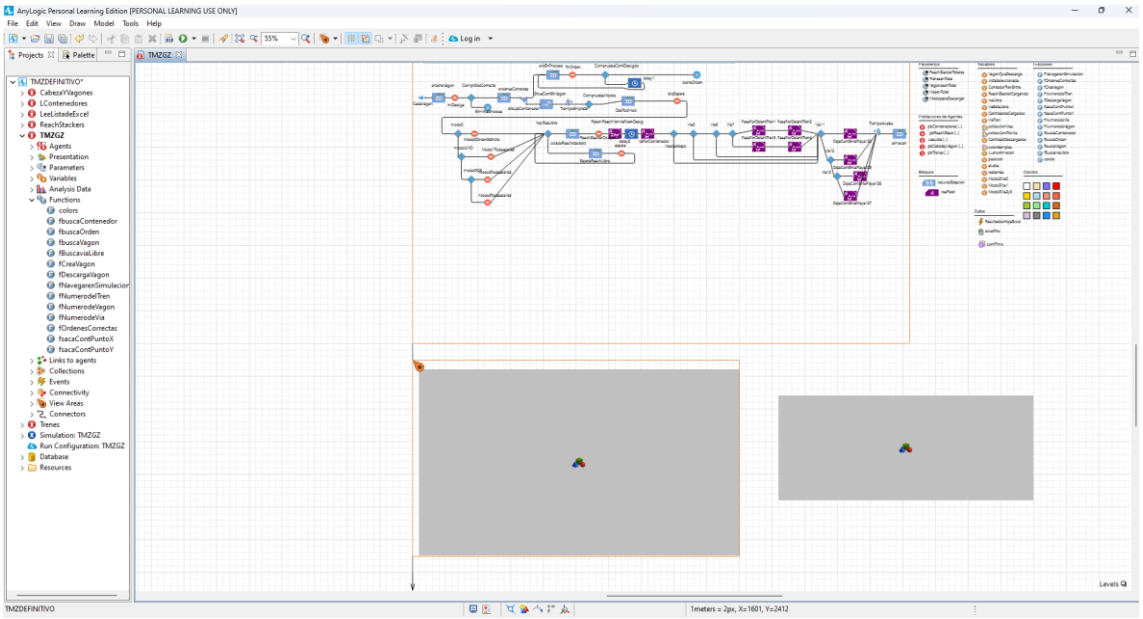
Análisis y simulación de la operativa de equipo de manutención en la terminal intermodal ferroviaria de transporte de mercancías para contenedores de Zaragoza

Escuela de Ingeniería y Arquitectura

2023

ANEXO I: AGENTE MAIN TMZGZ



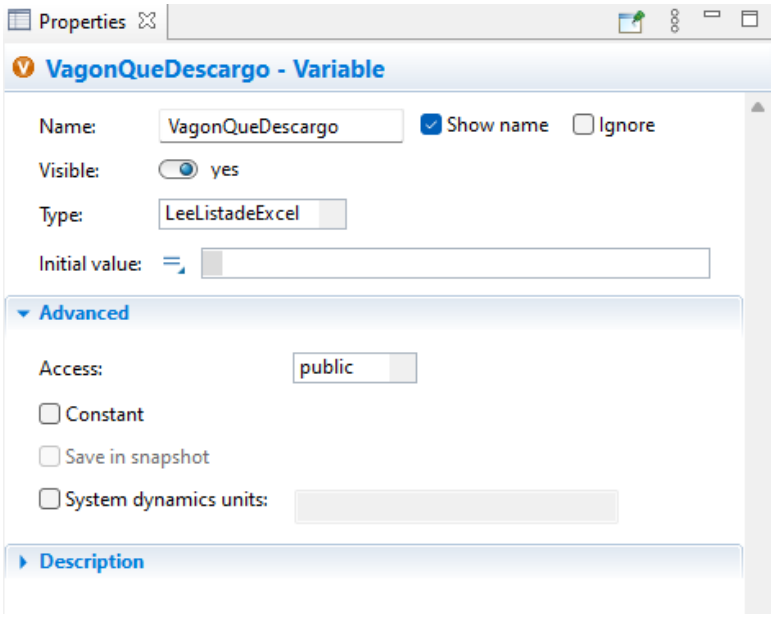


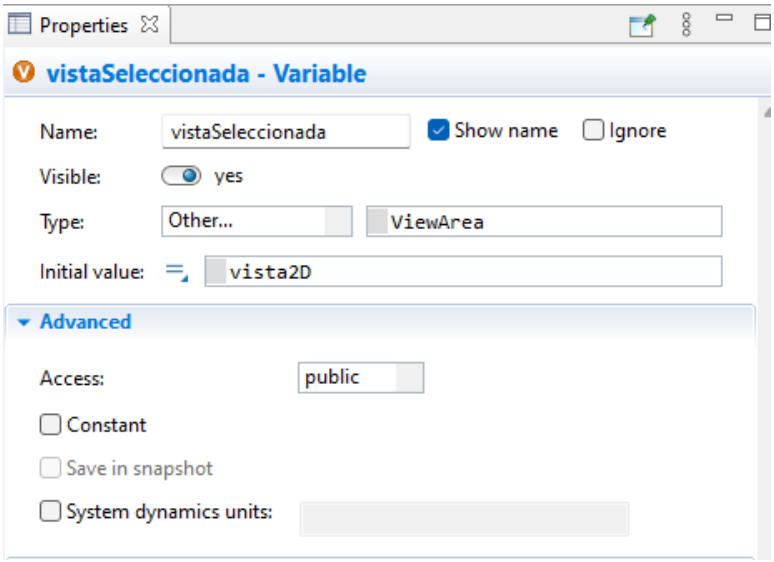
En estas dos imágenes tenemos el agente TMZGZ al completo con todo lo que contiene en su interior. En la primera imagen vemos el modelado de la terminal, la lógica de la terminal y sus distintos parámetros, variables y funciones

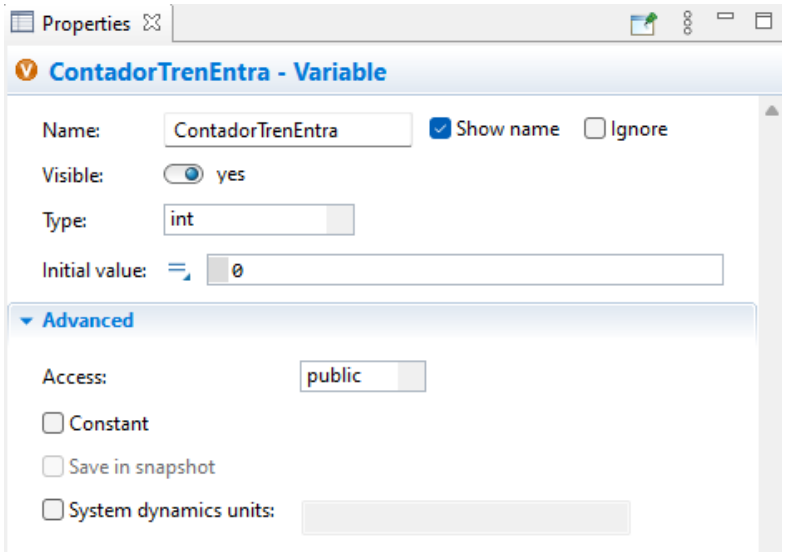
Las dos ventanas de abajo se utilizan únicamente para poder ver en 3D la terminal.

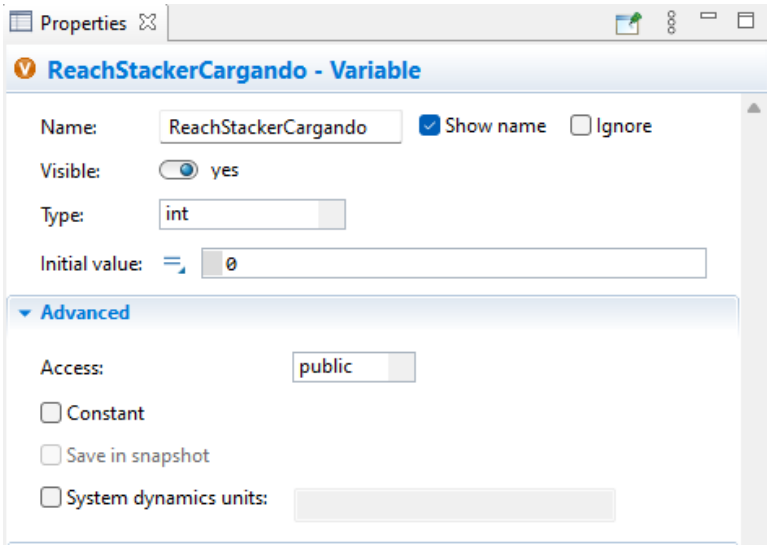
En esta imagen podemos ver los distintos parámetros que contiene todo el agente Main del programa.

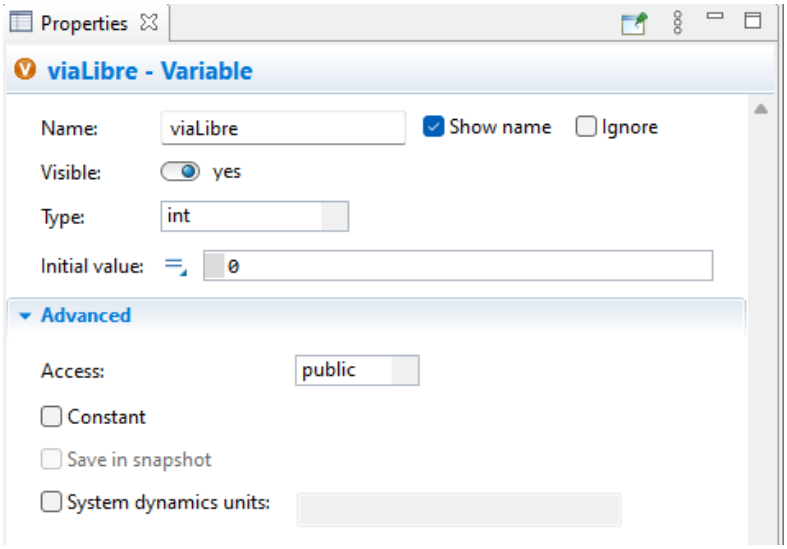
ANEXO 2: VARIABLES DE LA TERMINAL.

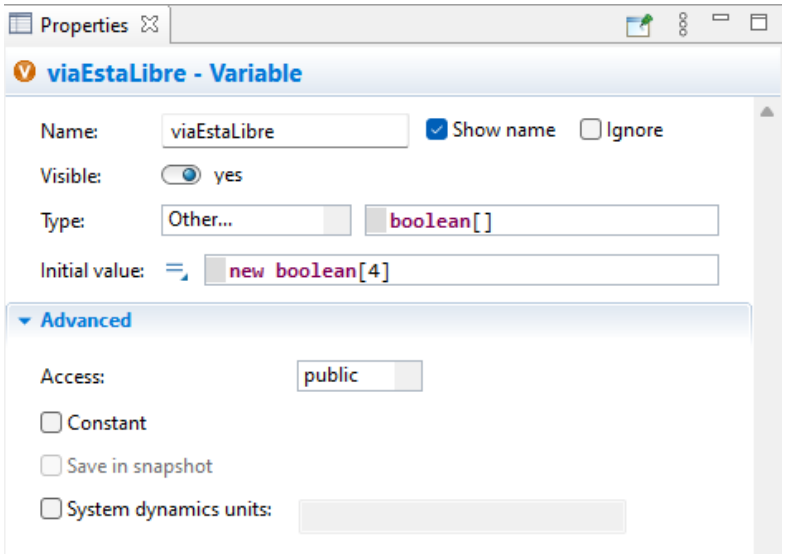


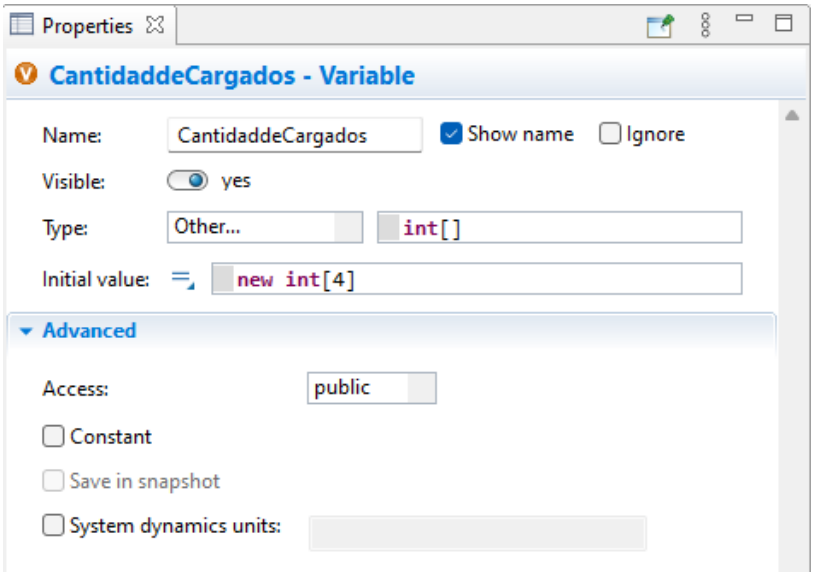


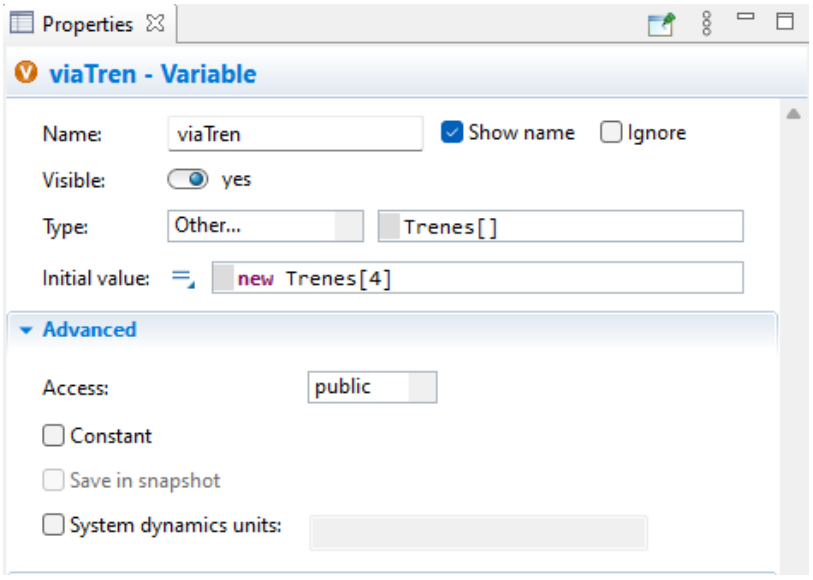

Properties
ContadorTrenEntra - Variable
Name: ContadorTrenEntra
Show name
Ignore
Visible: yes
Type: int
Initial value: 0
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:

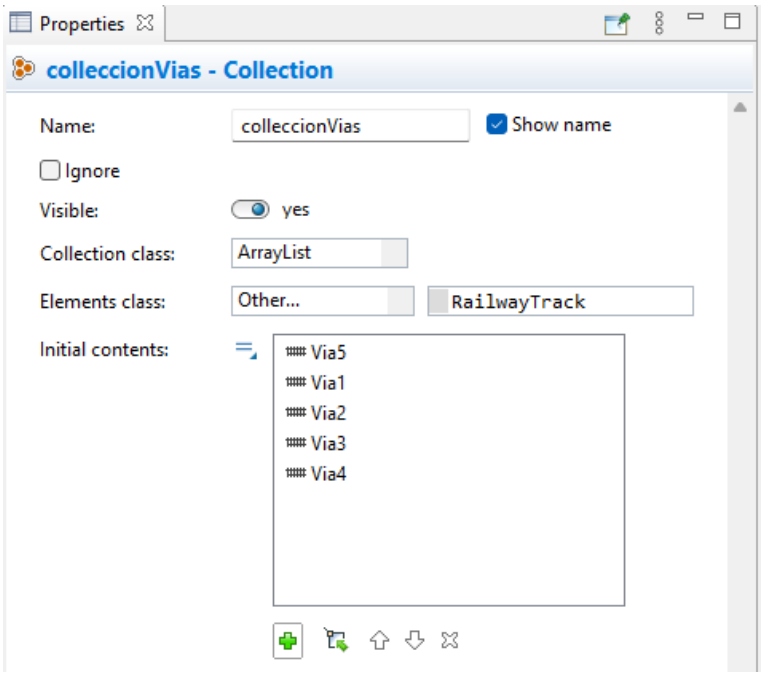

Properties
ReachStackerCargando - Variable
Name: ReachStackerCargando
Show name
Ignore
Visible: yes
Type: int
Initial value: 0
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:

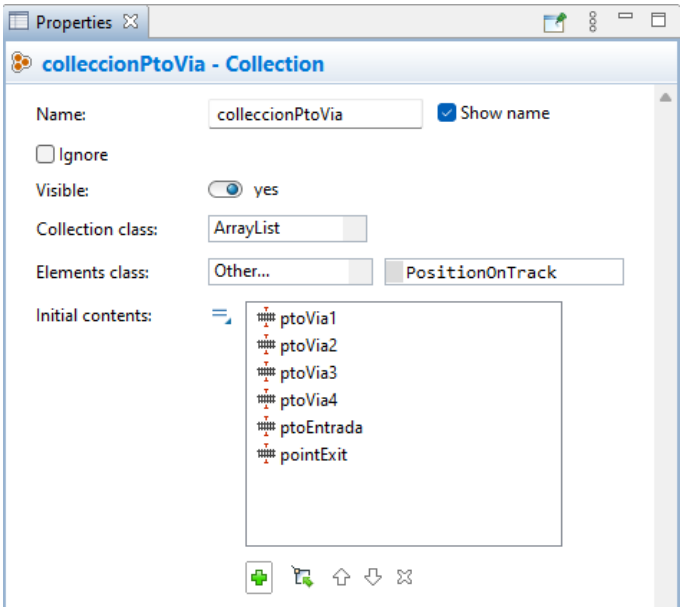

Properties
viaLibre - Variable
Name: viaLibre
Show name
Ignore
Visible: yes
Type: int
Initial value: 0
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:

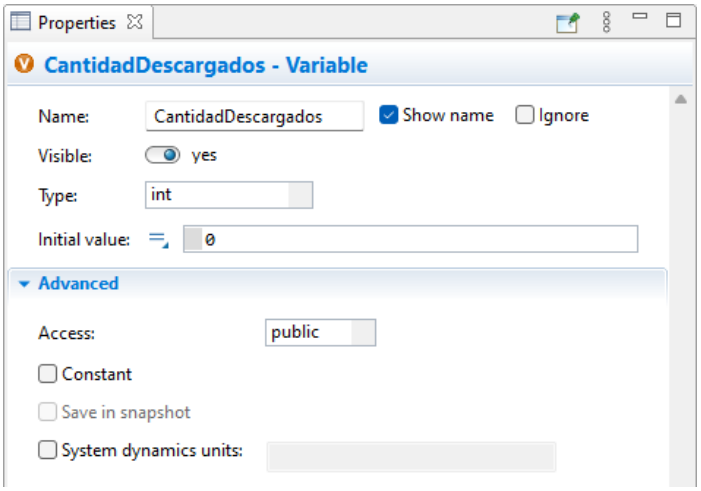

Properties
viaEstaLibre - Variable
Name: viaEstaLibre
Show name
Ignore
Visible: yes
Type: Other...
boolean[]
Initial value:
new boolean[4]
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:

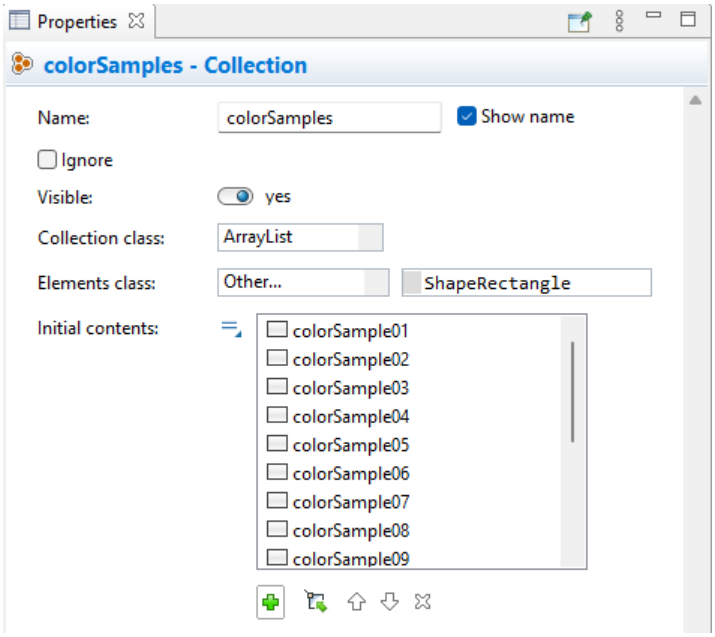

Properties
CantidaddeCargados - Variable
Name: CantidaddeCargados
Show name
Ignore
Visible: yes
Type: Other...
int[]
Initial value:
new int[4]
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:

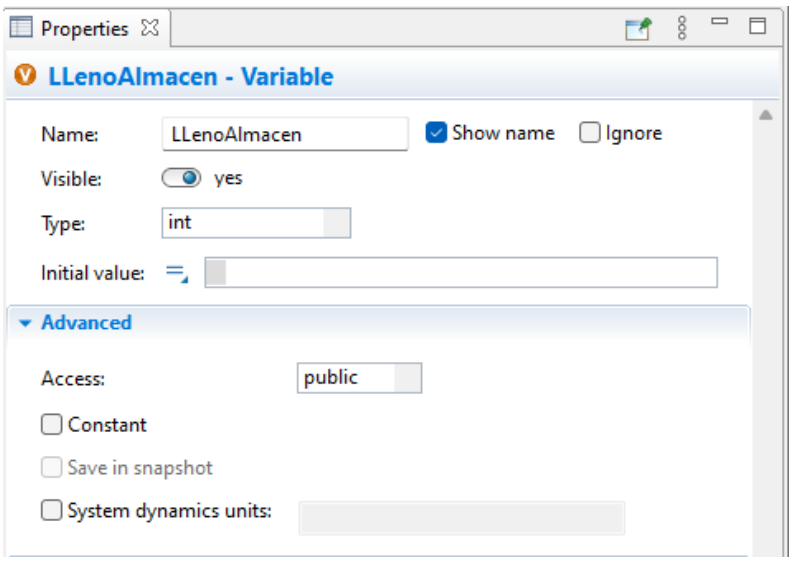

Properties
viaTren - Variable
Name:
viaTren
Show name
Ignore
Visible:
yes
Type:
Other...
Trenes[]
Initial value:
new Trenes[4]
Advanced
Access:
public
Constant
Save in snapshot
System dynamics units:

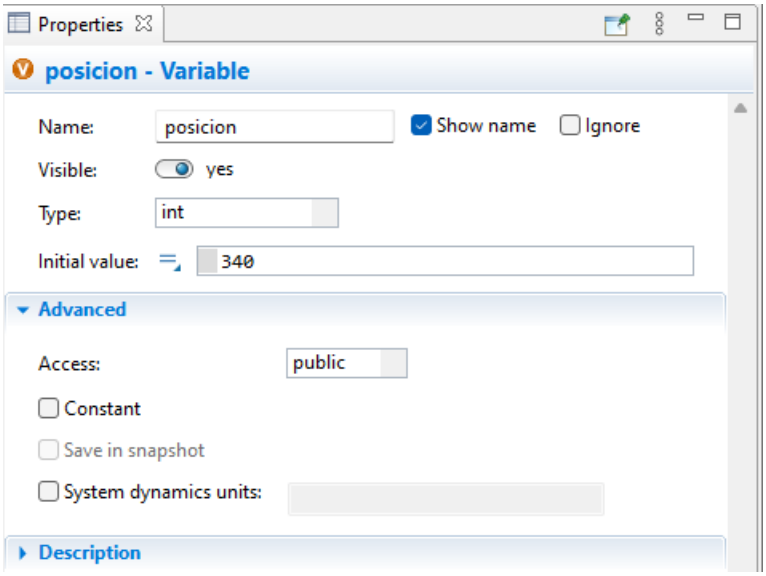

Properties
colleccionVias - Collection
Name:
colleccionVias
Show name
Ignore
Visible:
yes
Collection class:
ArrayList
Elements class:
Other...
RailwayTrack
Initial contents:
Via5
Via1
Via2
Via3
Via4

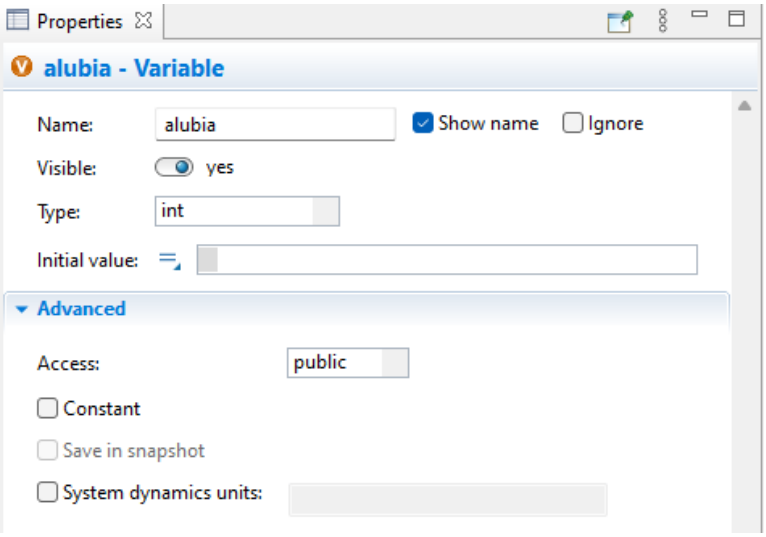

Properties
colleccionPtoVia - Collection
Name:
colleccionPtoVia
Show name
Ignore
Visible:
yes
Collection class:
ArrayList
Elements class:
Other...
PositionOnTrack
Initial contents:
ptoVia1
ptoVia2
ptoVia3
ptoVia4
ptoEntrada
pointExit

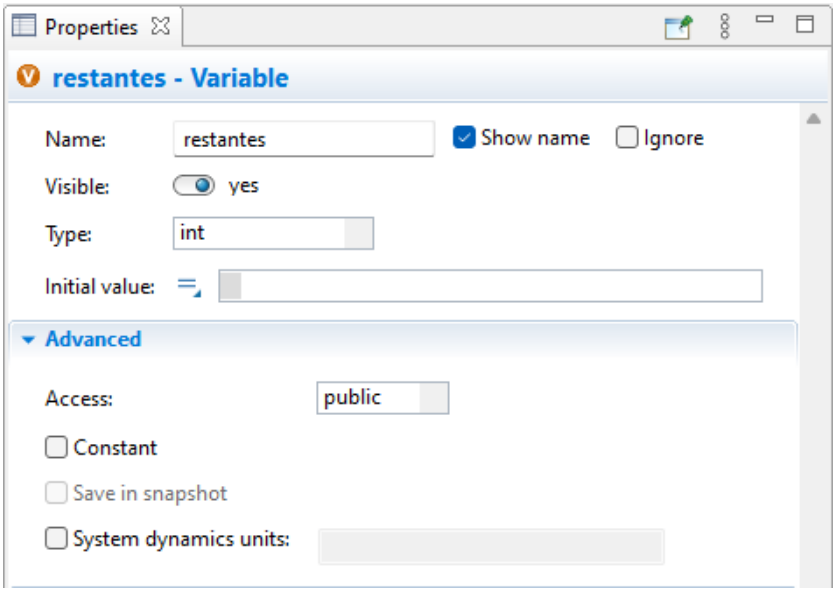

Properties
CantidadDescargados - Variable
Name:
CantidadDescargados
Show name
Ignore
Visible:
yes
Type:
int
Initial value:
0
Advanced
Access:
public
Constant
Save in snapshot
System dynamics units:

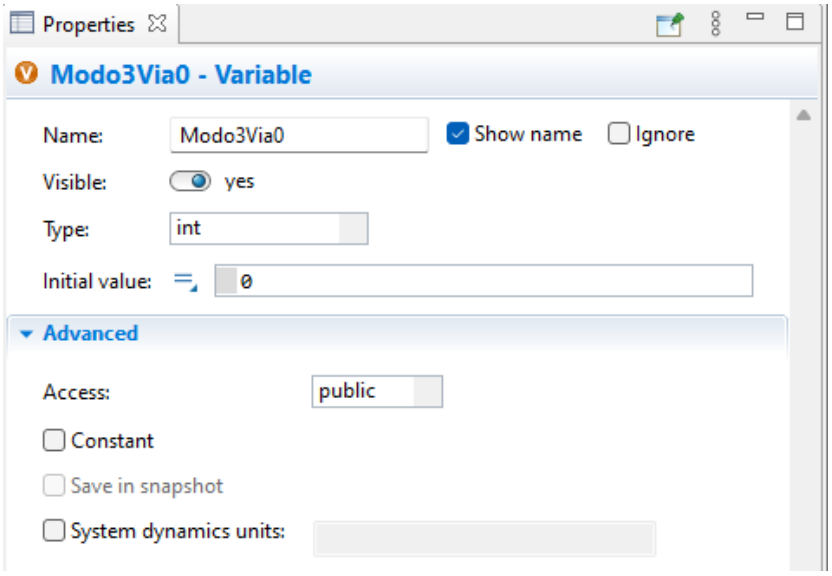

Properties
colorSamples - Collection
Name:
colorSamples
Show name
Ignore
Visible:
yes
Collection class:
ArrayList
Elements class:
Other...
ShapeRectangle
Initial contents:
colorSample01
colorSample02
colorSample03
colorSample04
colorSample05
colorSample06
colorSample07
colorSample08
colorSample09

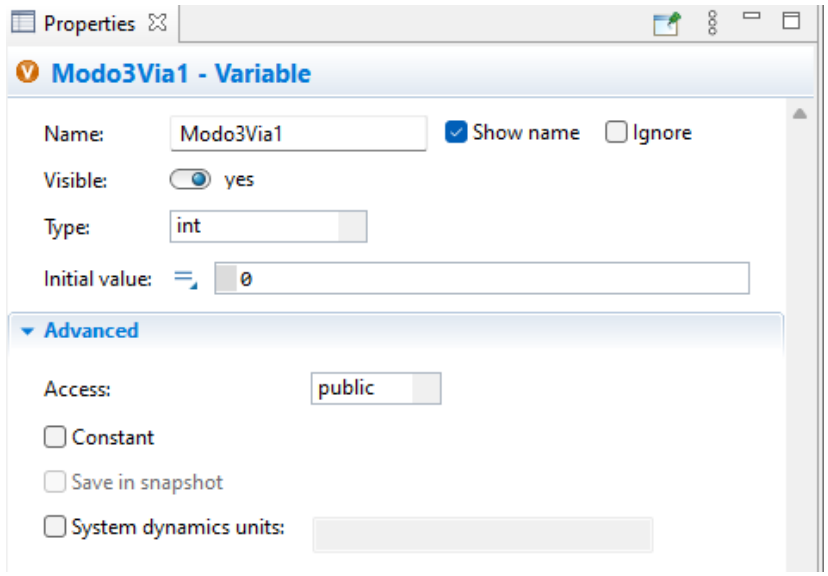

Properties
LLenoAlmacen - Variable
Name:
LLenoAlmacen
Show name
Ignore
Visible:
yes
Type:
int
Initial value:
Advanced
Access:
public
Constant
Save in snapshot
System dynamics units:

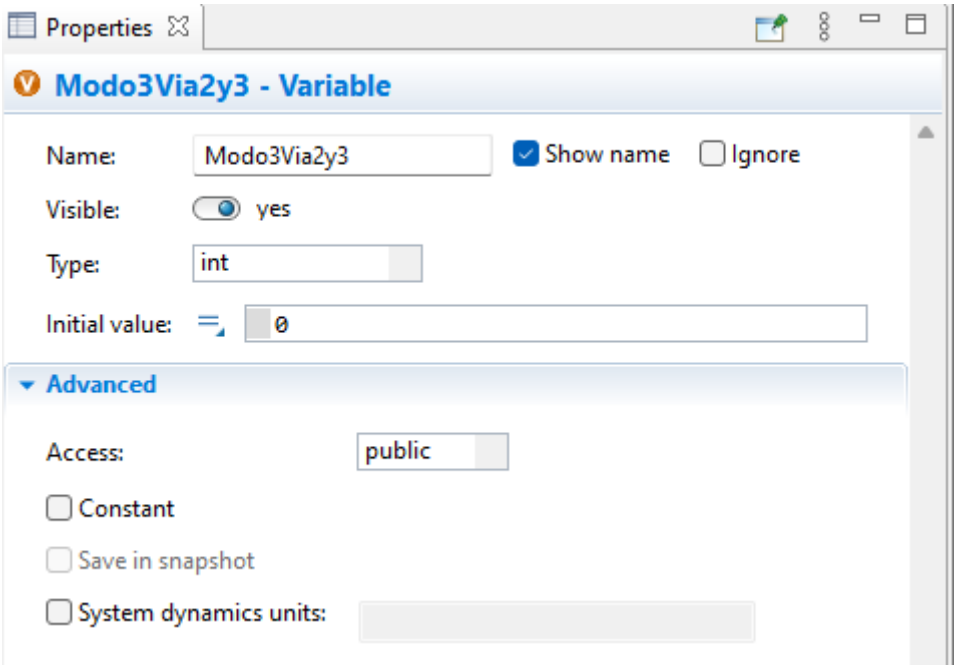

Properties
posicion - Variable
Name: posicion
Show name
Ignore
Visible: yes
Type: int
Initial value: 340
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:
Description


Properties
alubia - Variable
Name: alubia
Show name
Ignore
Visible: yes
Type: int
Initial value:
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:

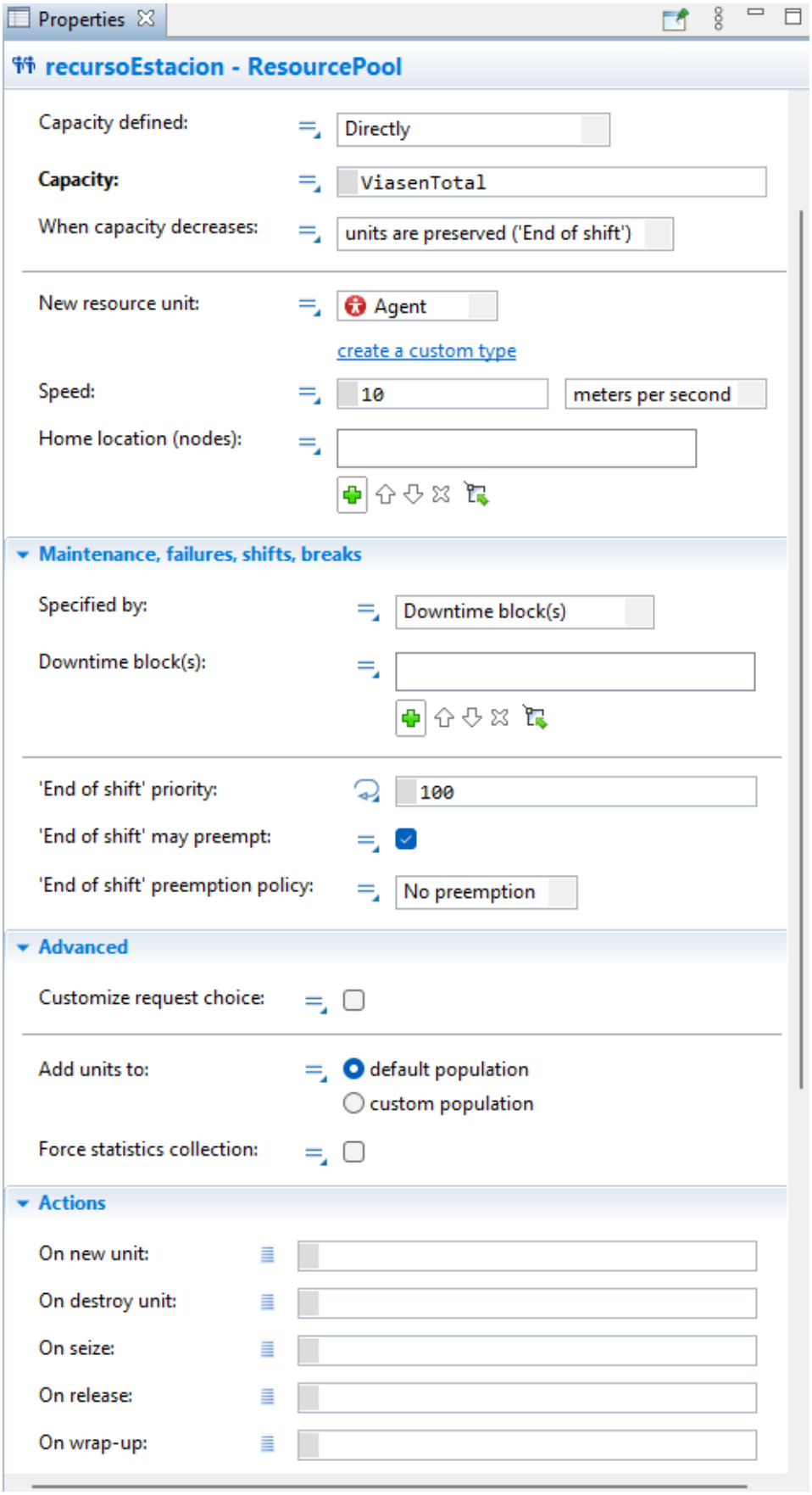

Properties
restantes - Variable
Name: restantes
Show name
Ignore
Visible: yes
Type: int
Initial value:
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:

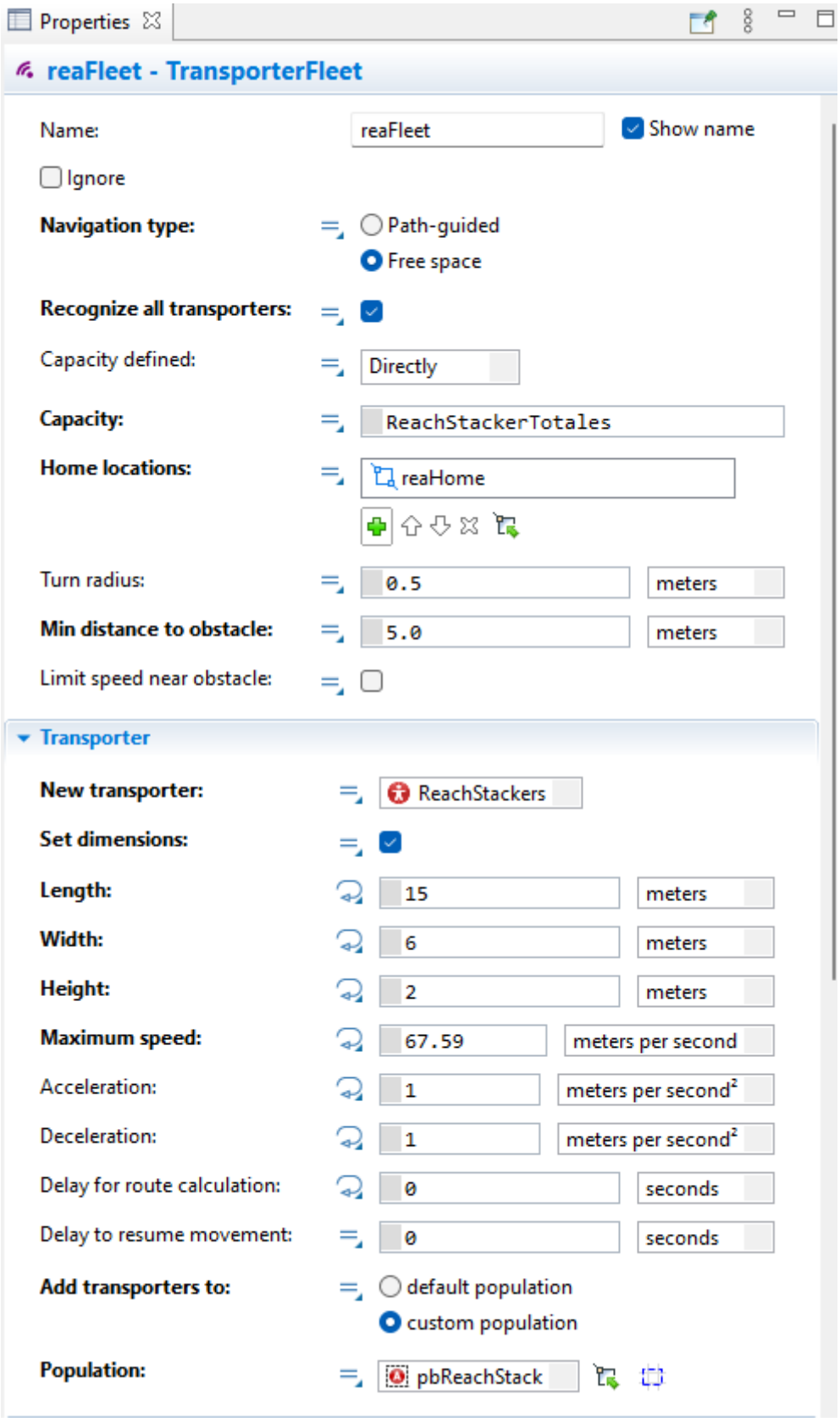

Properties
Modo3Via0 - Variable
Name: Modo3Via0
Show name
Ignore
Visible: yes
Type: int
Initial value: 0
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:

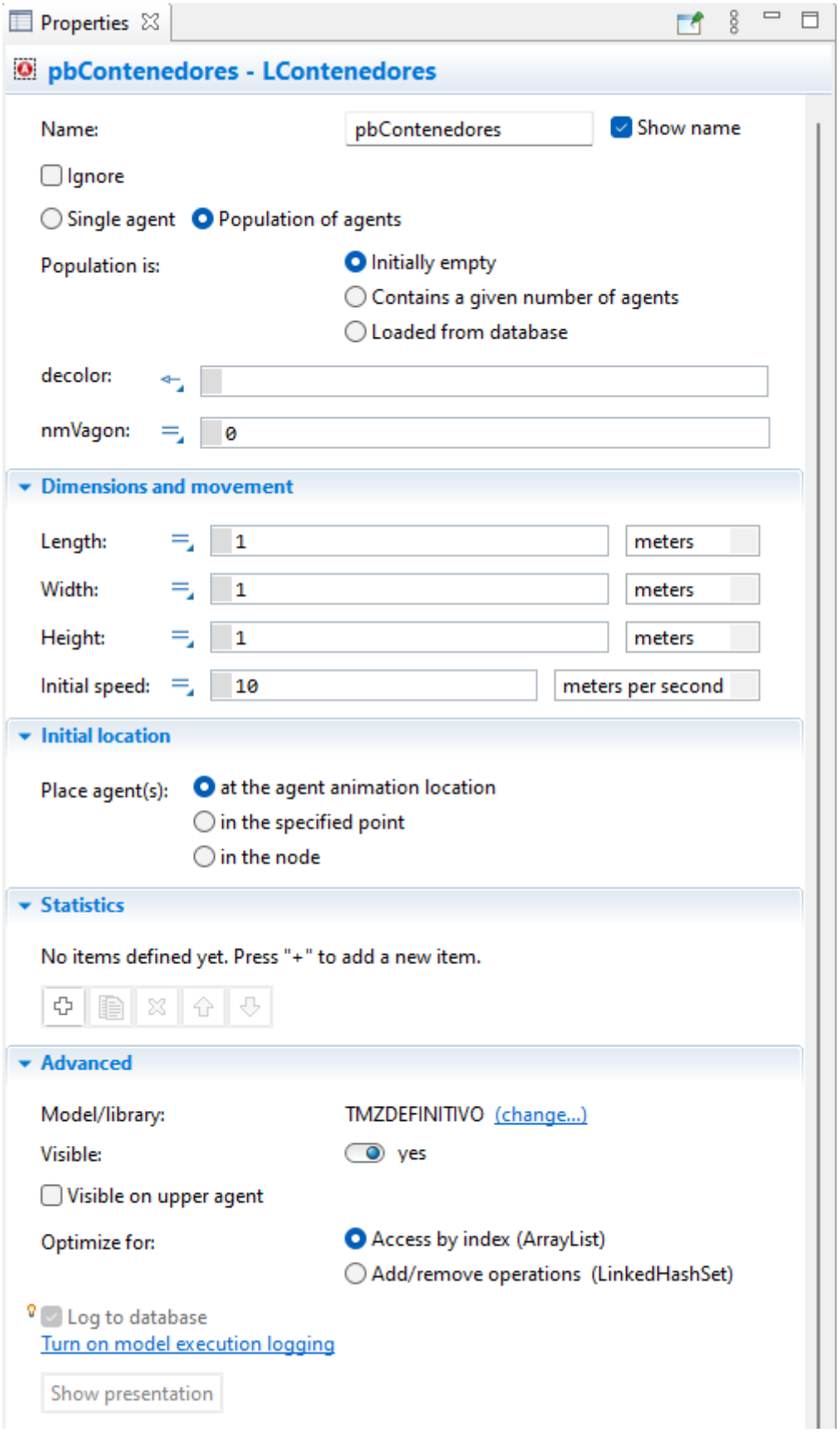

Properties
Modo3Via1 - Variable
Name: Modo3Via1
Show name
Ignore
Visible: yes
Type: int
Initial value: 0
Advanced
Access: public
Constant
Save in snapshot
System dynamics units:

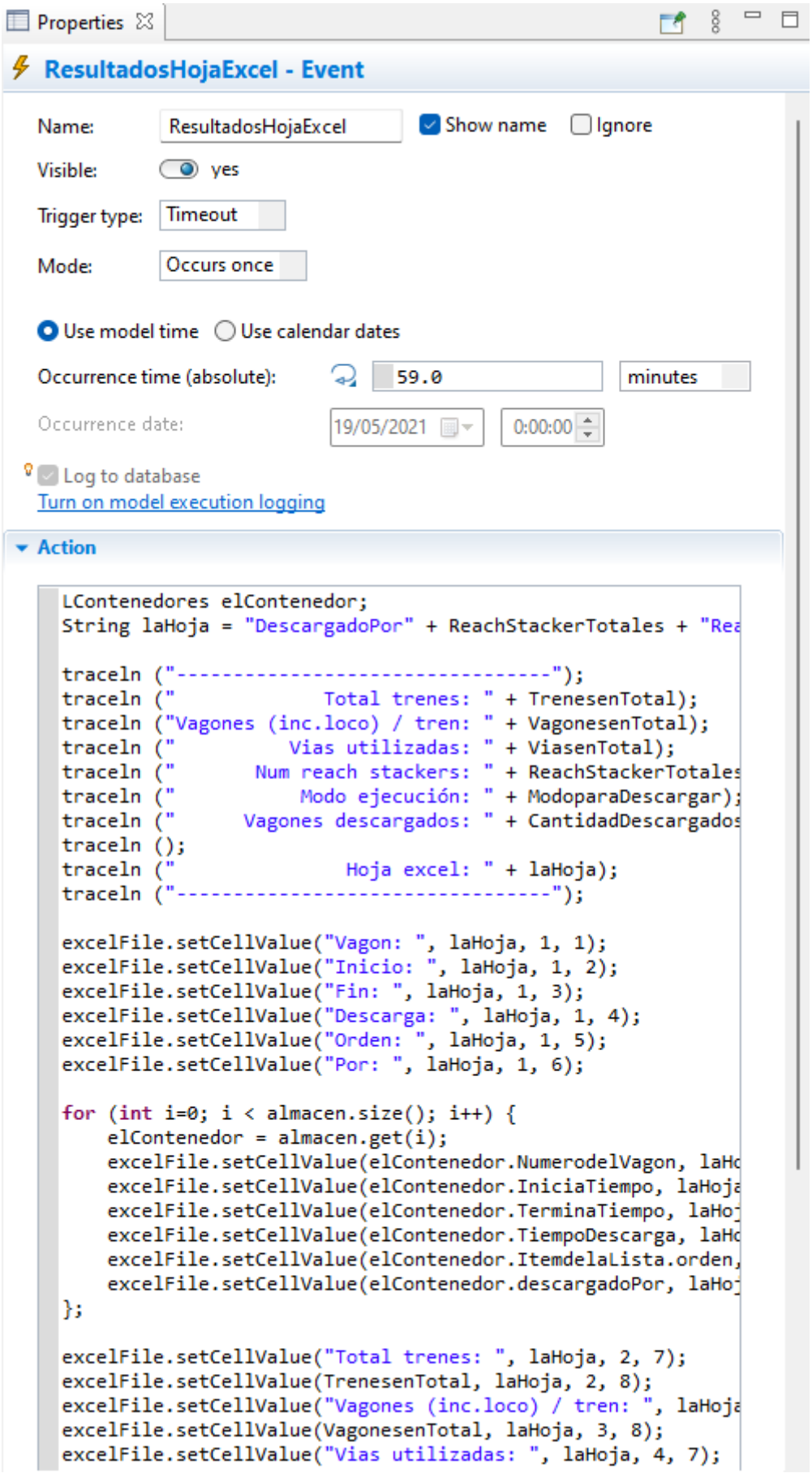

Properties
Modo3Via2y3 - Variable
Name:
Modo3Via2y3
Show name
Ignore
Visible:
yes
Type:
int
Initial value:
0
Advanced
Access:
public
Constant
Save in snapshot
System dynamics units:

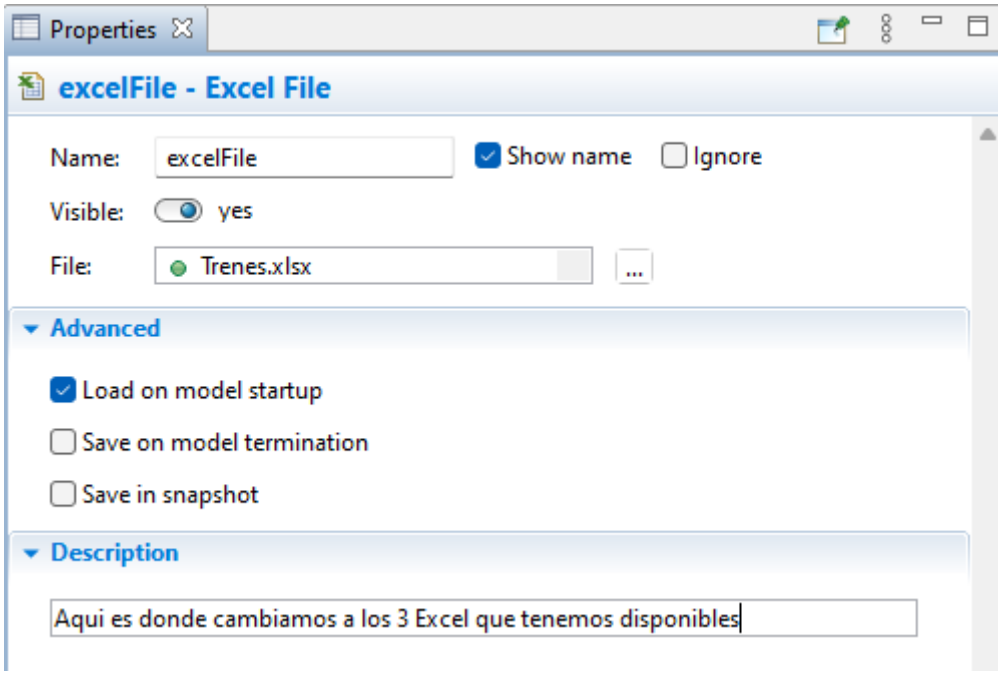
ANEXO 3: BLOQUES, DATOS, POBLACIONES Y PARAMETROS

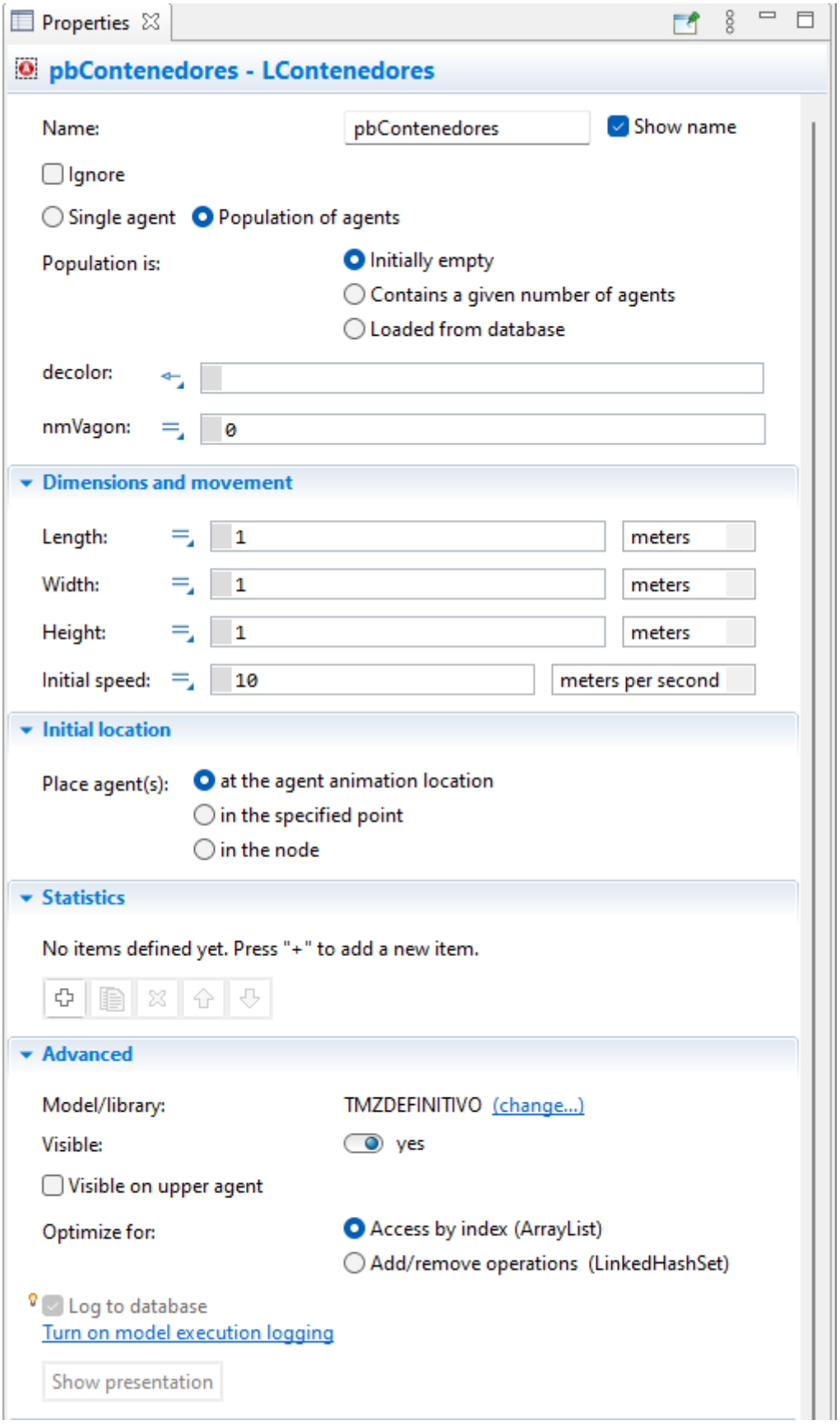


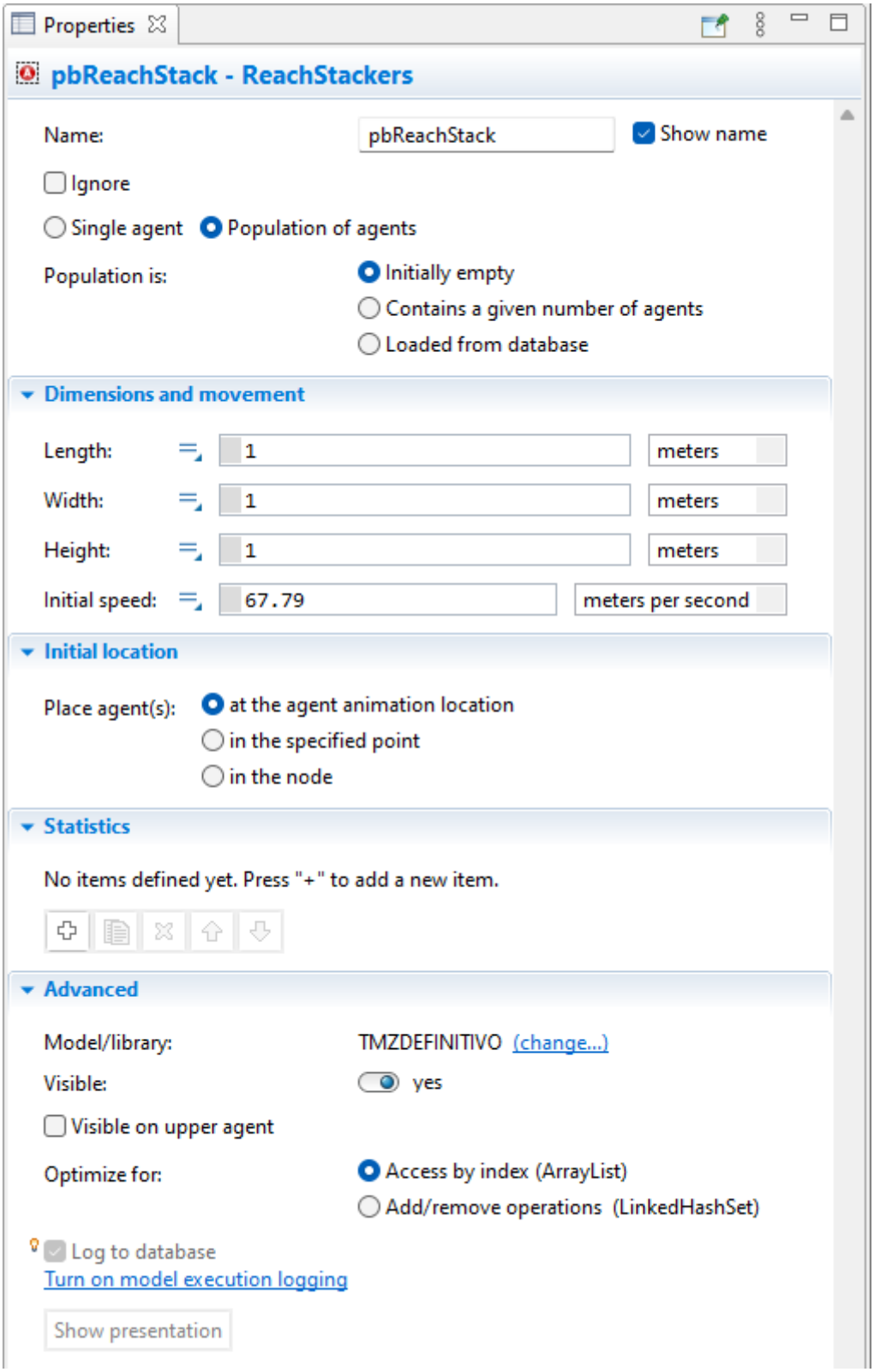

Properties
reaFleet - TransporterFleet
Name:
reaFleet
Show name
Ignore
Navigation type:
Path-guided
Free space
Recognize all transporters:
Capacity defined:
Directly
Capacity:
ReachStackerTotales
Home locations:
reaHome
Turn radius:
0.5
meters
Min distance to obstacle:
5.0
meters
Limit speed near obstacle:
Transporter
New transporter:
ReachStackers
Set dimensions:
Length:
15
meters
Width:
6
meters
Height:
2
meters
Maximum speed:
67.59
meters per second
Acceleration:
1
meters per second²
Deceleration:
1
meters per second²
Delay for route calculation:
0
seconds
Delay to resume movement:
0
seconds
Add transporters to:
default population
custom population
Population:
pbReachStack

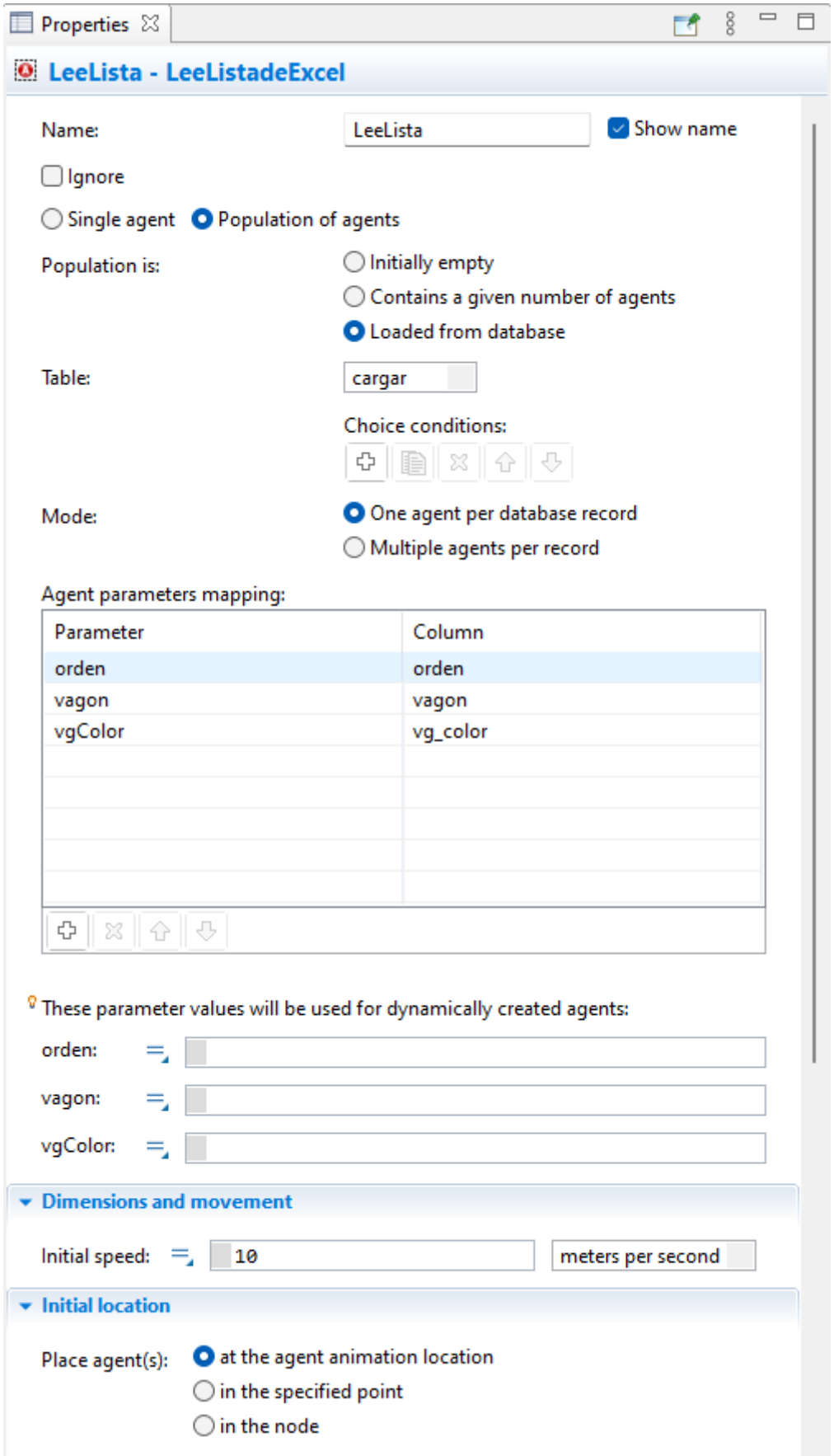

Properties
pbContenedores - LContenedores
Name:
pbContenedores
Show name
Ignore
Single agent
Population of agents
Population is:
Initially empty
Contains a given number of agents
Loaded from database
decolor:
nmVagon:
0
Dimensions and movement
Length:
1
meters
Width:
1
meters
Height:
1
meters
Initial speed:
10
meters per second
Initial location
Place agent(s):
at the agent animation location
in the specified point
in the node
Statistics
No items defined yet. Press "+" to add a new item.
Advanced
Model/library:
TMZDEFINITIVO
(change...)
Visible:
yes
Visible on upper agent
Optimize for:
Access by index (ArrayList)
Add/remove operations (LinkedHashSet)
Log to database
Turn on model execution logging
Show presentation

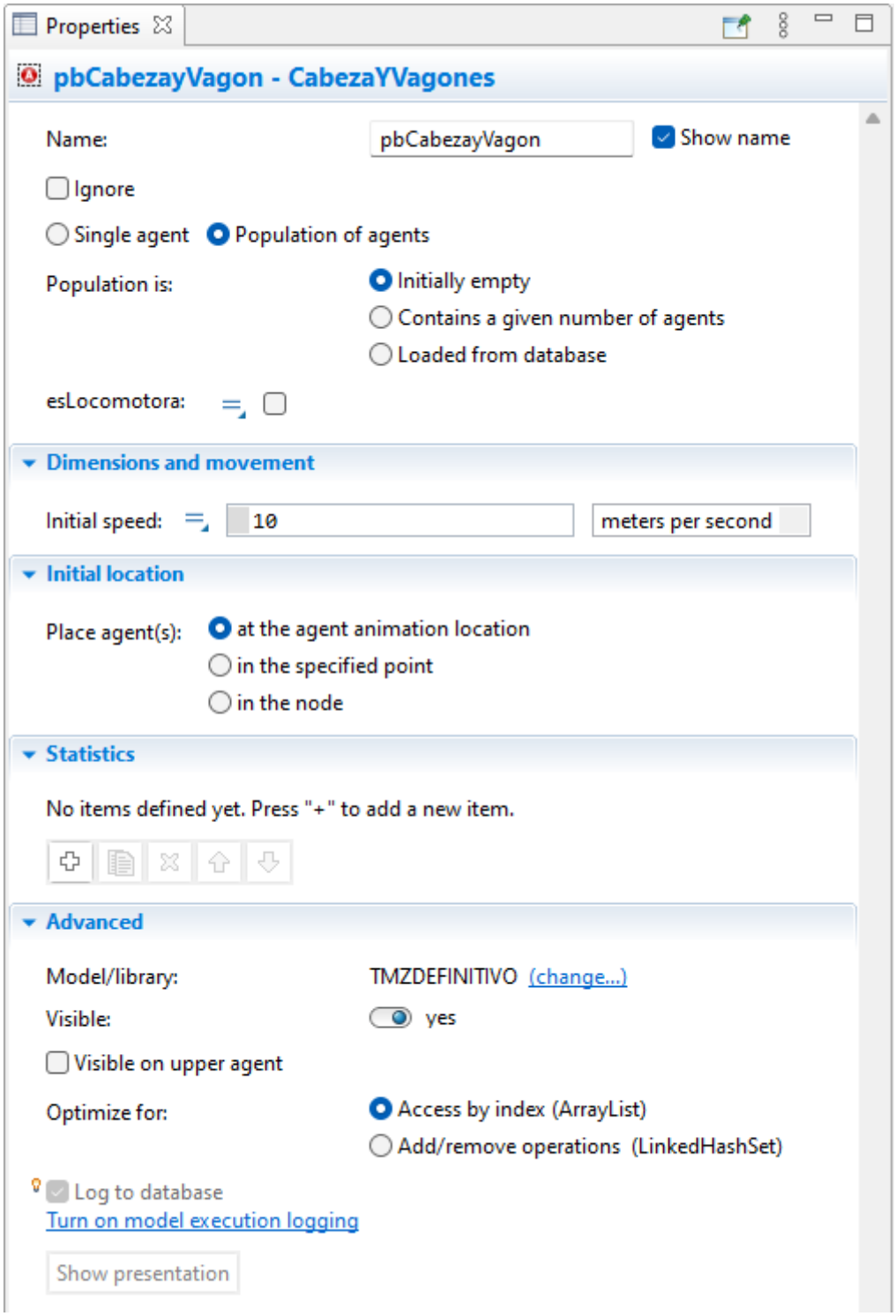

Properties
ResultadosHojaExcel - Event
Name: ResultadosHojaExcel
Show name
Ignore
Visible: yes
Trigger type: Timeout
Mode: Occurs once
Use model time
Use calendar dates
Occurrence time (absolute): 59.0 minutes
Occurrence date: 19/05/2021 0:00:00
Log to database
Turn on model execution logging
Action
LContenedores elContenedor;
String laHoja = "DescargadoPor" + ReachStackerTotales + "Rea
traceln ("----------");
traceln ("Total trenes: " + TrenesenTotal);
traceln ("Vagones (inc.loco) / tren: " + VagonesenTotal);
traceln ("Vias utilizadas: " + ViasenTotal);
traceln ("Num reach stackers: " + ReachStackerTotales
traceln ("Modo ejecución: " + ModoparaDescargar);
traceln ("Vagones descargados: " + CantidadDescargados
traceln ();
traceln ("Hoja excel: " + laHoja);
traceln ("----------");
excelFile.setCellValue("Vagon: ", laHoja, 1, 1);
excelFile.setCellValue("Inicio: ", laHoja, 1, 2);
excelFile.setCellValue("Fin: ", laHoja, 1, 3);
excelFile.setCellValue("Descarga: ", laHoja, 1, 4);
excelFile.setCellValue("Orden: ", laHoja, 1, 5);
excelFile.setCellValue("Por: ", laHoja, 1, 6);
for (int i=0; i < almacen.size(); i++) {
elContenedor = almacen.get(i);
excelFile.setCellValue(elContenedor.NumerodelVagon, laHo
excelFile.setCellValue(elContenedor.IniciaTiempo, laHoja
excelFile.setCellValue(elContenedor.TerminaTiempo, laHoj
excelFile.setCellValue(elContenedor.TiempoDescarga, laHo
excelFile.setCellValue(elContenedor.ItemdelaLista.orden,
excelFile.setCellValue(elContenedor.descargadoPor, laHoj
};
excelFile.setCellValue("Total trenes: ", laHoja, 2, 7);
excelFile.setCellValue(TrenesenTotal, laHoja, 2, 8);
excelFile.setCellValue("Vagones (inc.loco) / tren: ", laHoja
excelFile.setCellValue(VagonesenTotal, laHoja, 3, 8);
excelFile.setCellValue("Vias utilizadas: ", laHoja, 4, 7);

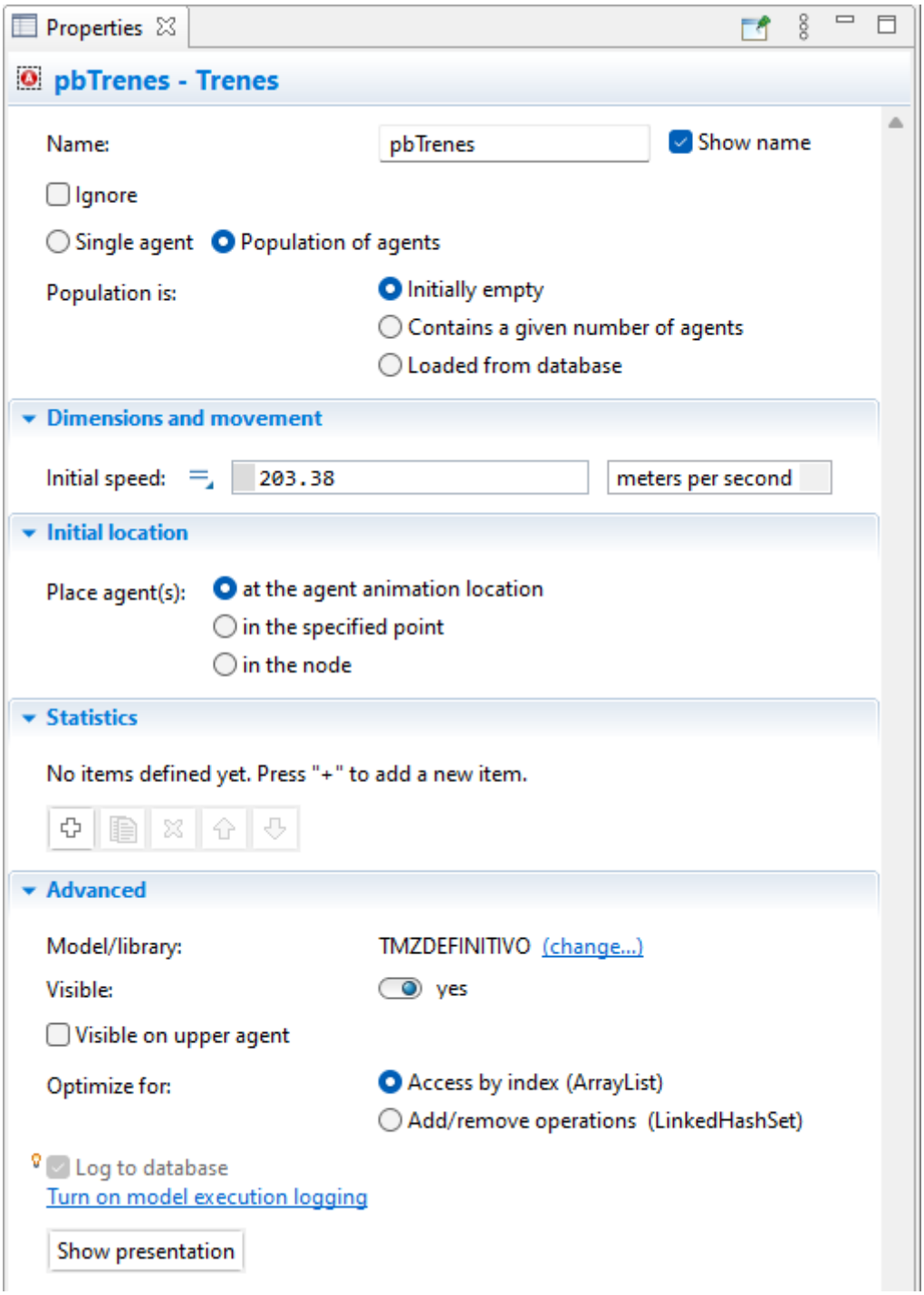

Properties
excelFile - Excel File
Name:
excelFile
Show name
Ignore
Visible:
yes
File:
Trenes.xlsx
...
Advanced
Load on model startup
Save on model termination
Save in snapshot
Description
Aqui es donde cambiamos a los 3 Excel que tenemos disponibles

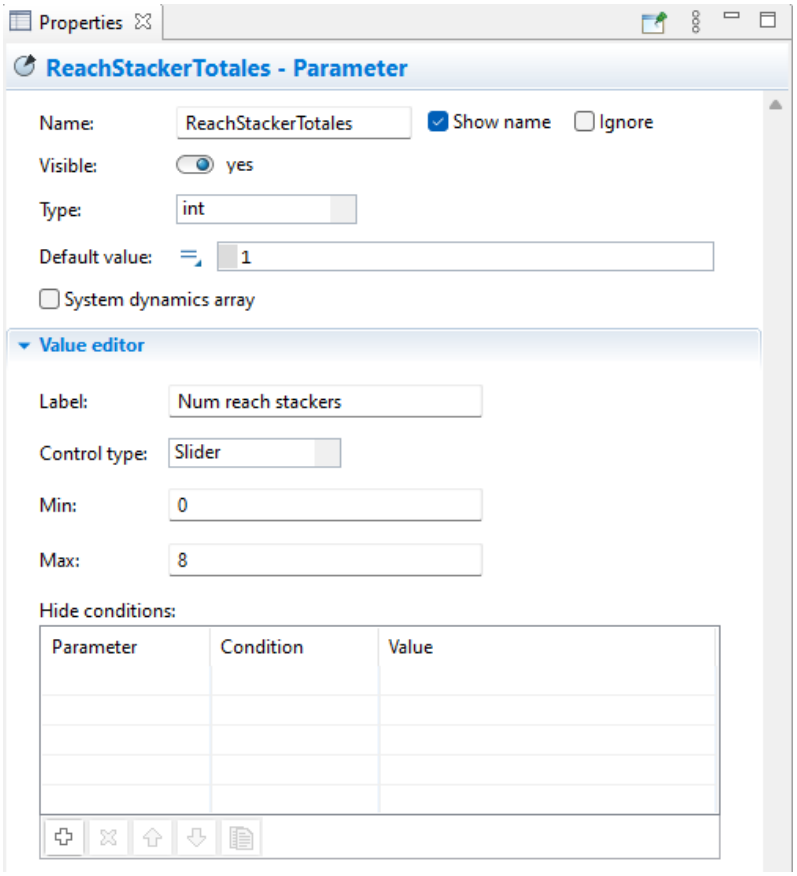

Properties
pbContenedores - LContenedores
Name:
pbContenedores
Show name
Ignore
Single agent
Population of agents
Population is:
Initially empty
Contains a given number of agents
Loaded from database
decolor:
nmVagon:
0
Dimensions and movement
Length:
1
meters
Width:
1
meters
Height:
1
meters
Initial speed:
10
meters per second
Initial location
Place agent(s):
at the agent animation location
in the specified point
in the node
Statistics
No items defined yet. Press "+" to add a new item.
Advanced
Model/library:
TMZDEFINITIVO
(change...)
Visible:
yes
Visible on upper agent
Optimize for:
Access by index (ArrayList)
Add/remove operations (LinkedHashSet)
Log to database
Turn on model execution logging
Show presentation

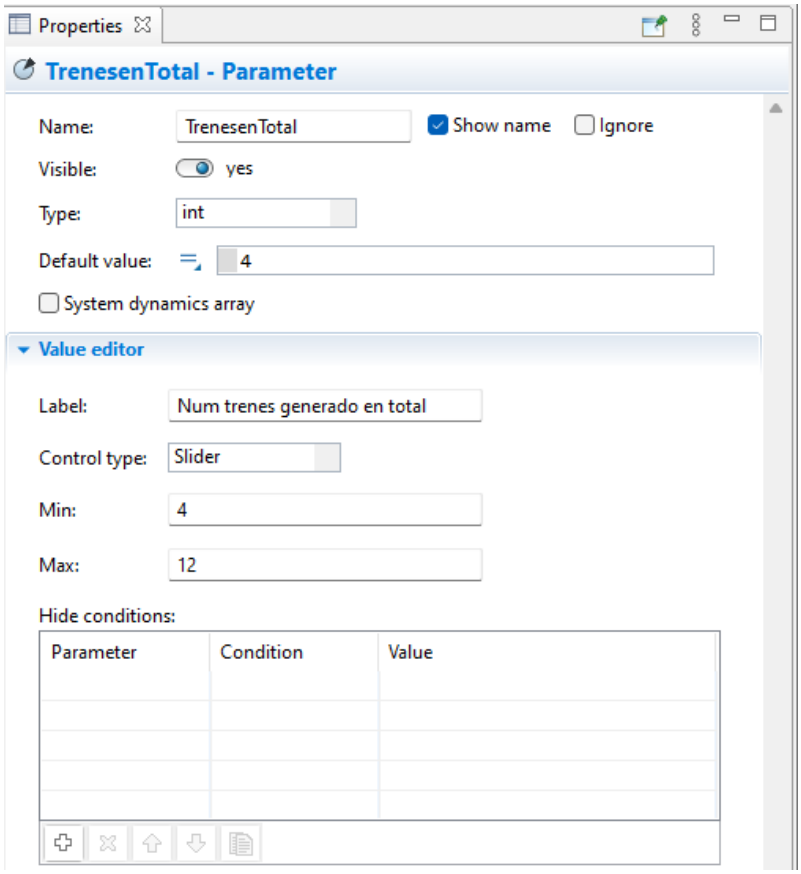

Properties
pbReachStack - ReachStackers
Name:
pbReachStack
Show name
Ignore
Single agent
Population of agents
Population is:
Initially empty
Contains a given number of agents
Loaded from database
Dimensions and movement
Length:
1
meters
Width:
1
meters
Height:
1
meters
Initial speed:
67.79
meters per second
Initial location
Place agent(s):
at the agent animation location
in the specified point
in the node
Statistics
No items defined yet. Press "+" to add a new item.
Advanced
Model/library:
TMZDEFINITIVO
(change...)
Visible:
yes
Visible on upper agent
Optimize for:
Access by index (ArrayList)
Add/remove operations (LinkedHashSet)
Log to database
Turn on model execution logging
Show presentation

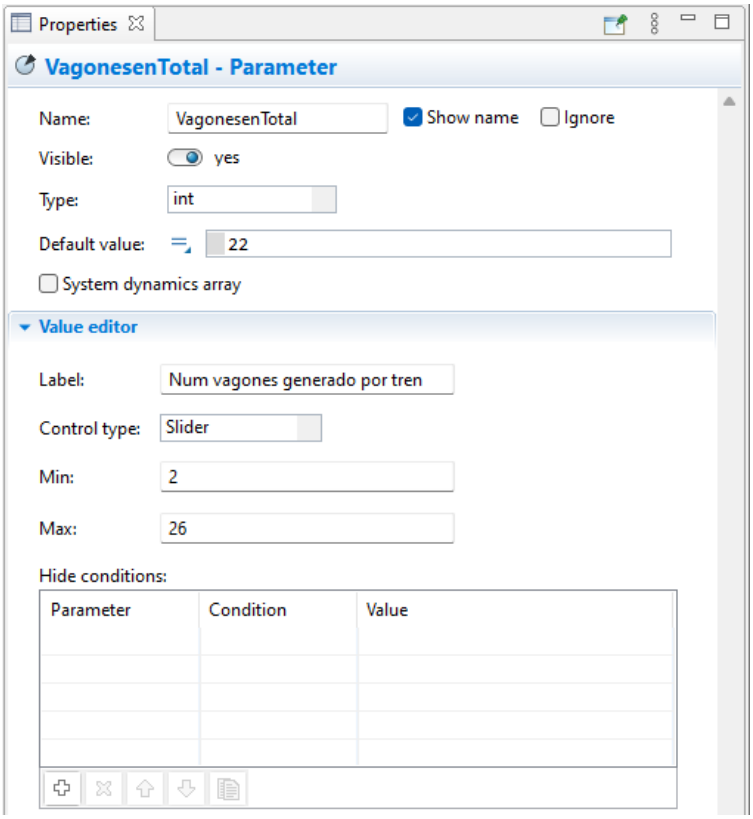

Properties
LeeLista - LeeListadeExcel
Name:
LeeLista
Show name
Ignore
Single agent
Population of agents
Population is:
Initially empty
Contains a given number of agents
Loaded from database
Table:
cargar
Choice conditions:
Mode:
One agent per database record
Multiple agents per record
Agent parameters mapping:
Parameter
Column
orden
orden
vagon
vagon
vgColor
vg_color
These parameter values will be used for dynamically created agents:
orden:
vagon:
vgColor:
Dimensions and movement
Initial speed:
10
meters per second
Initial location
Place agent(s):
at the agent animation location
in the specified point
in the node

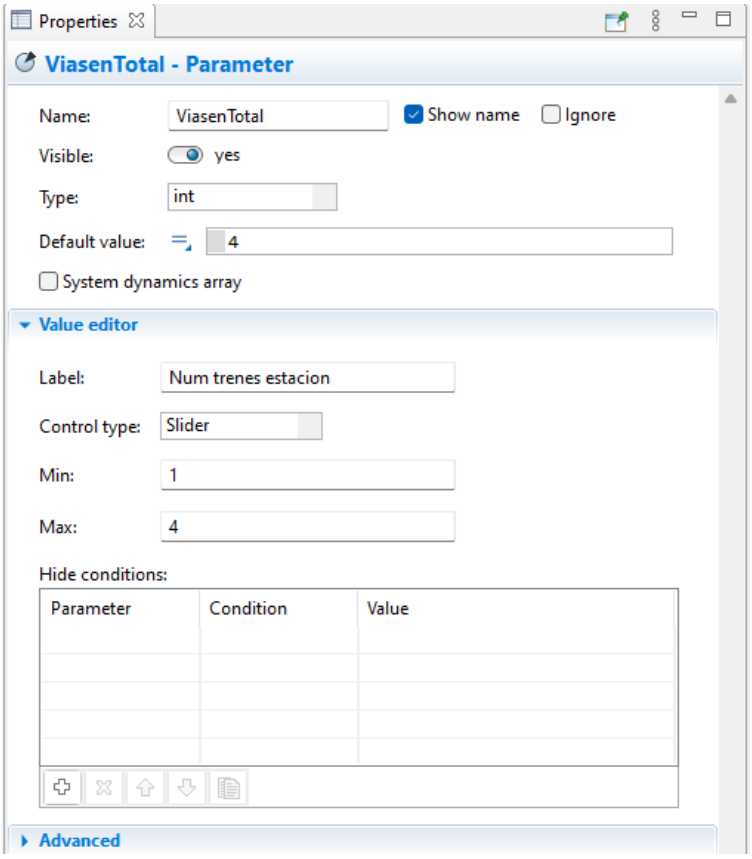

Properties
pbCabezayVagon - CabezaYVagones
Name:
pbCabezayVagon
Show name
Ignore
Single agent
Population of agents
Population is:
Initially empty
Contains a given number of agents
Loaded from database
esLocomotora:
Dimensions and movement
Initial speed:
10
meters per second
Initial location
Place agent(s):
at the agent animation location
in the specified point
in the node
Statistics
No items defined yet. Press "+" to add a new item.
Advanced
Model/library:
TMZDEFINITIVO
(change...)
Visible:
yes
Visible on upper agent
Optimize for:
Access by index (ArrayList)
Add/remove operations (LinkedHashSet)
Log to database
Turn on model execution logging
Show presentation

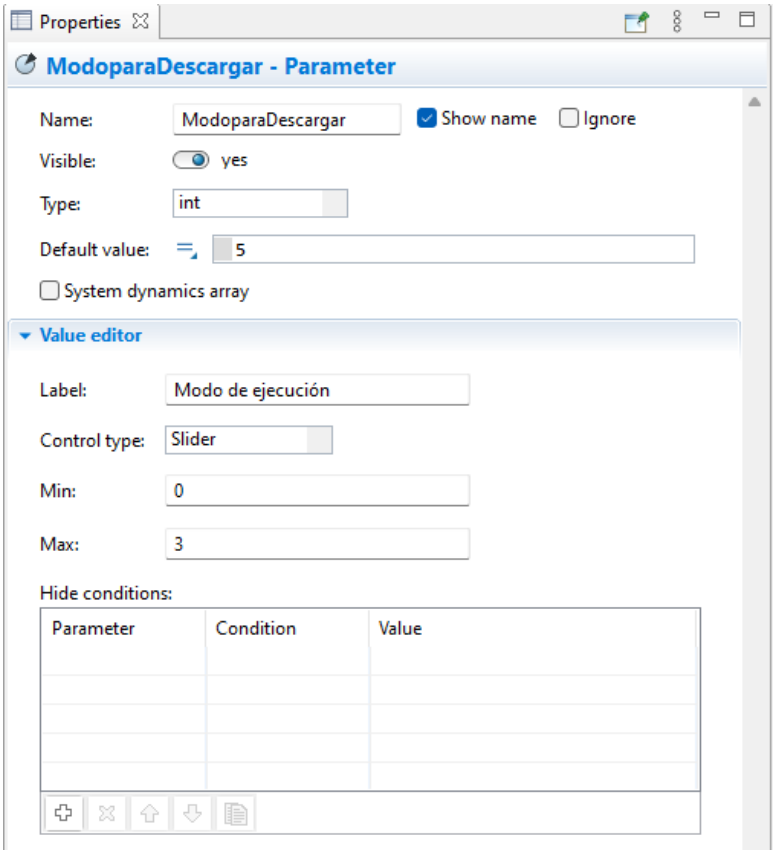

Properties
pbTrenes - Trenes
Name:
pbTrenes
Show name
Ignore
Single agent
Population of agents
Population is:
Initially empty
Contains a given number of agents
Loaded from database
Dimensions and movement
Initial speed:
203.38
meters per second
Initial location
Place agent(s):
at the agent animation location
in the specified point
in the node
Statistics
No items defined yet. Press "+" to add a new item.
Advanced
Model/library:
TMZDEFINITIVO
(change...)
Visible:
yes
Visible on upper agent
Optimize for:
Access by index (ArrayList)
Add/remove operations (LinkedHashSet)
Log to database
Turn on model execution logging
Show presentation


Properties
ReachStackerTotales - Parameter
Name:
ReachStackerTotales
Show name
Ignore
Visible:
yes
Type:
int
Default value:
1
System dynamics array
Value editor
Label:
Num reach stackers
Control type:
Slider
Min:
0
Max:
8
Hide conditions:
Parameter
Condition
Value


Properties
TrenesenTotal - Parameter
Name: TrenesenTotal
Show name
Ignore
Visible: yes
Type: int
Default value: 4
System dynamics array
Value editor
Label: Num trenes generado en total
Control type: Slider
Min: 4
Max: 12
Hide conditions:
Parameter
Condition
Value

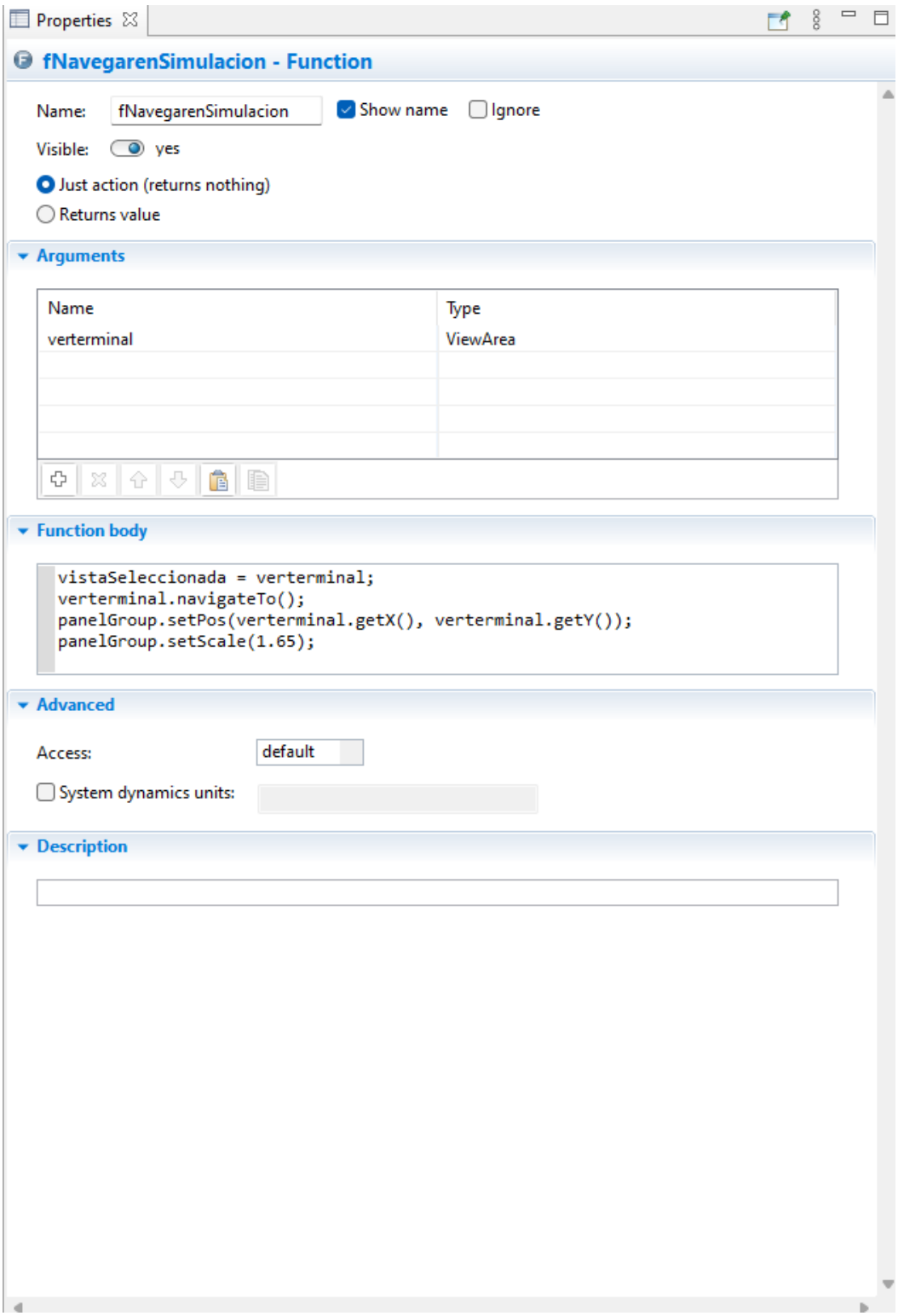

Properties
VagonesenTotal - Parameter
Name: VagonesenTotal
Show name
Ignore
Visible: yes
Type: int
Default value: 22
System dynamics array
Value editor
Label: Num vagones generado por tren
Control type: Slider
Min: 2
Max: 26
Hide conditions:
Parameter
Condition
Value

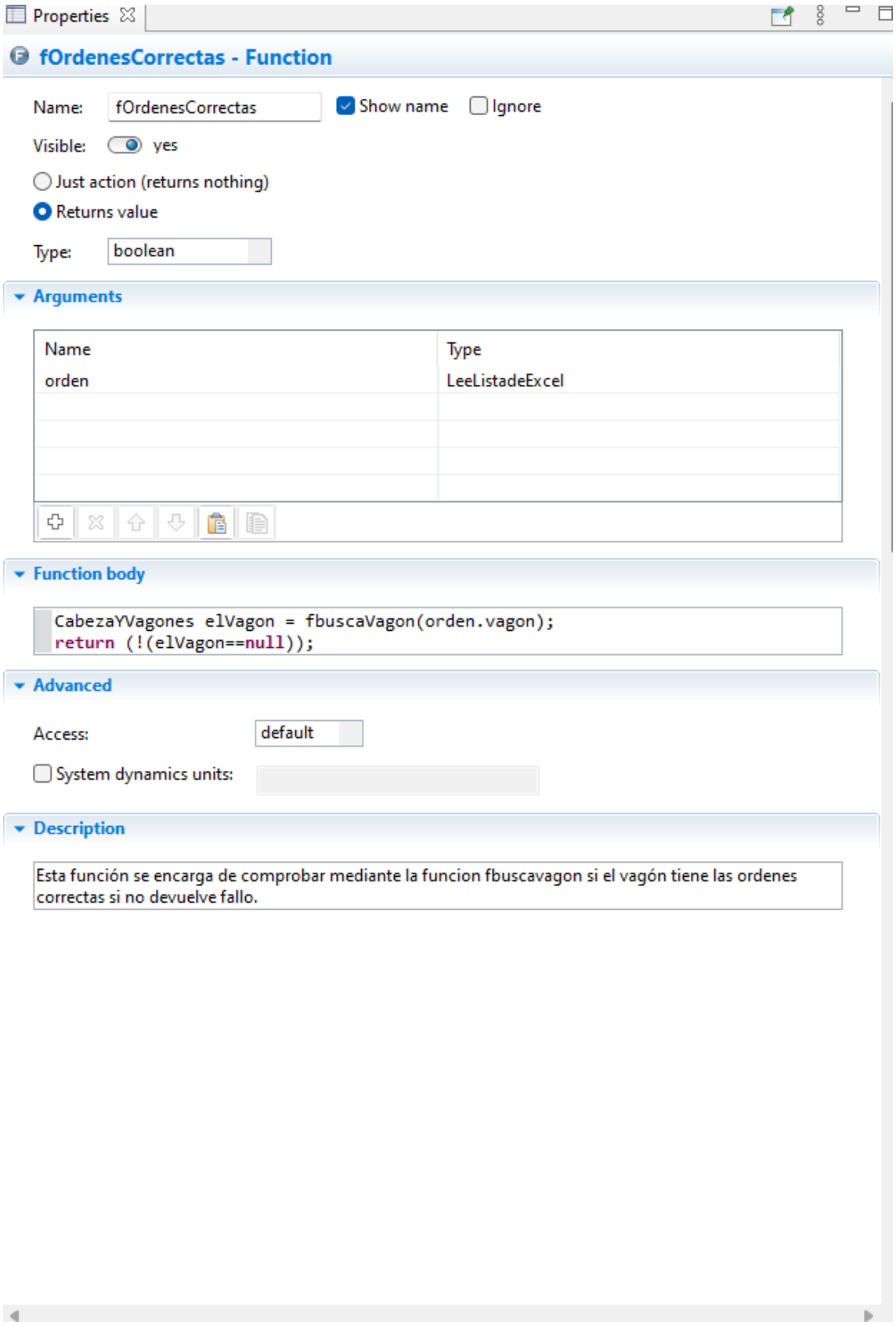

Properties
ViasenTotal - Parameter
Name:
ViasenTotal
Show name
Ignore
Visible:
yes
Type:
int
Default value:
4
System dynamics array
Value editor
Label:
Num trenes estacion
Control type:
Slider
Min:
1
Max:
4
Hide conditions:
Parameter
Condition
Value
Advanced

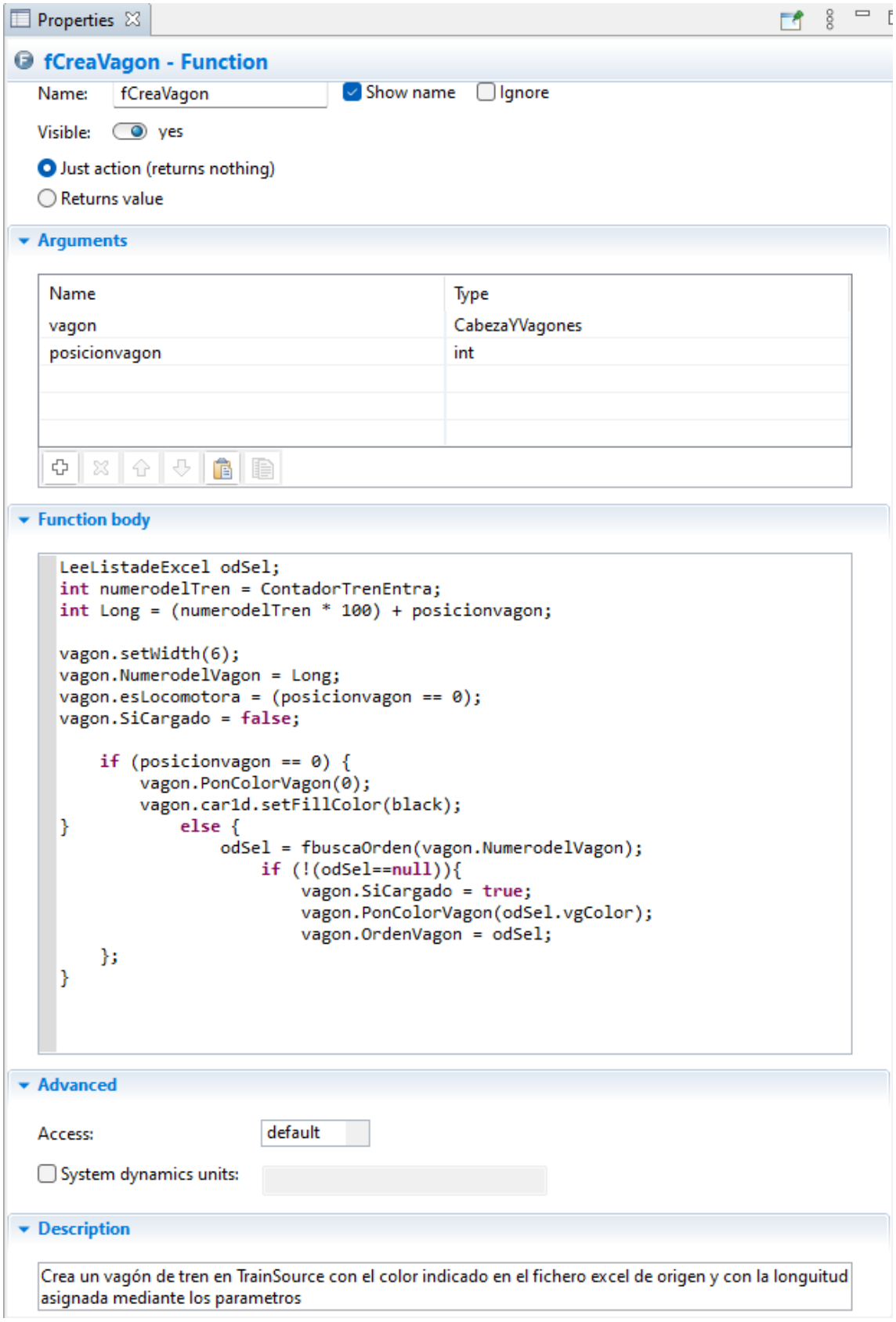

Properties
ModoparaDescargar - Parameter
Name:
ModoparaDescargar
Show name
Ignore
Visible:
yes
Type:
int
Default value:
5
System dynamics array
Value editor
Label:
Modo de ejecución
Control type:
Slider
Min:
0
Max:
3
Hide conditions:
Parameter
Condition
Value

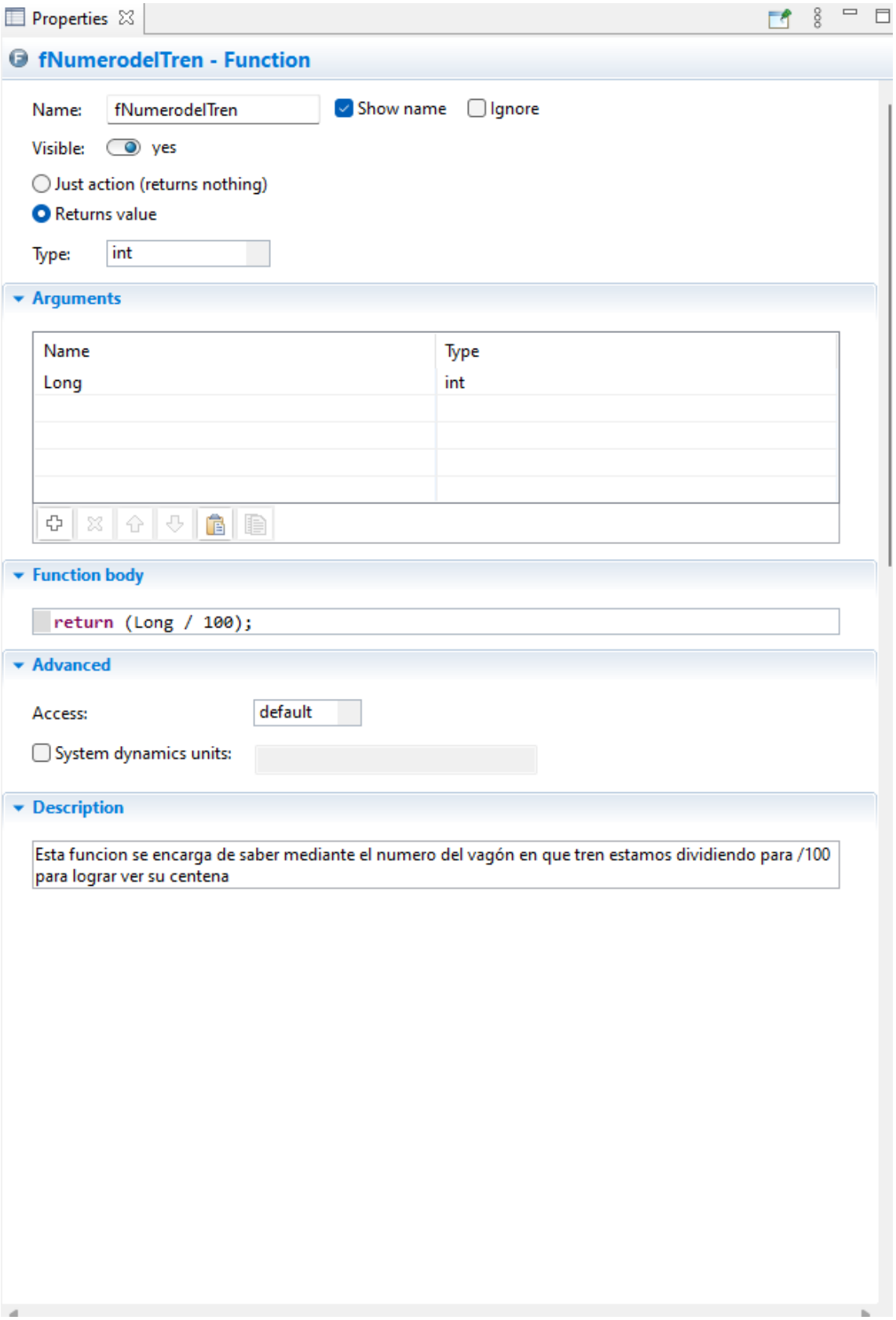
ANEXO 4: FUNCIONES DE LA TERMINAL.

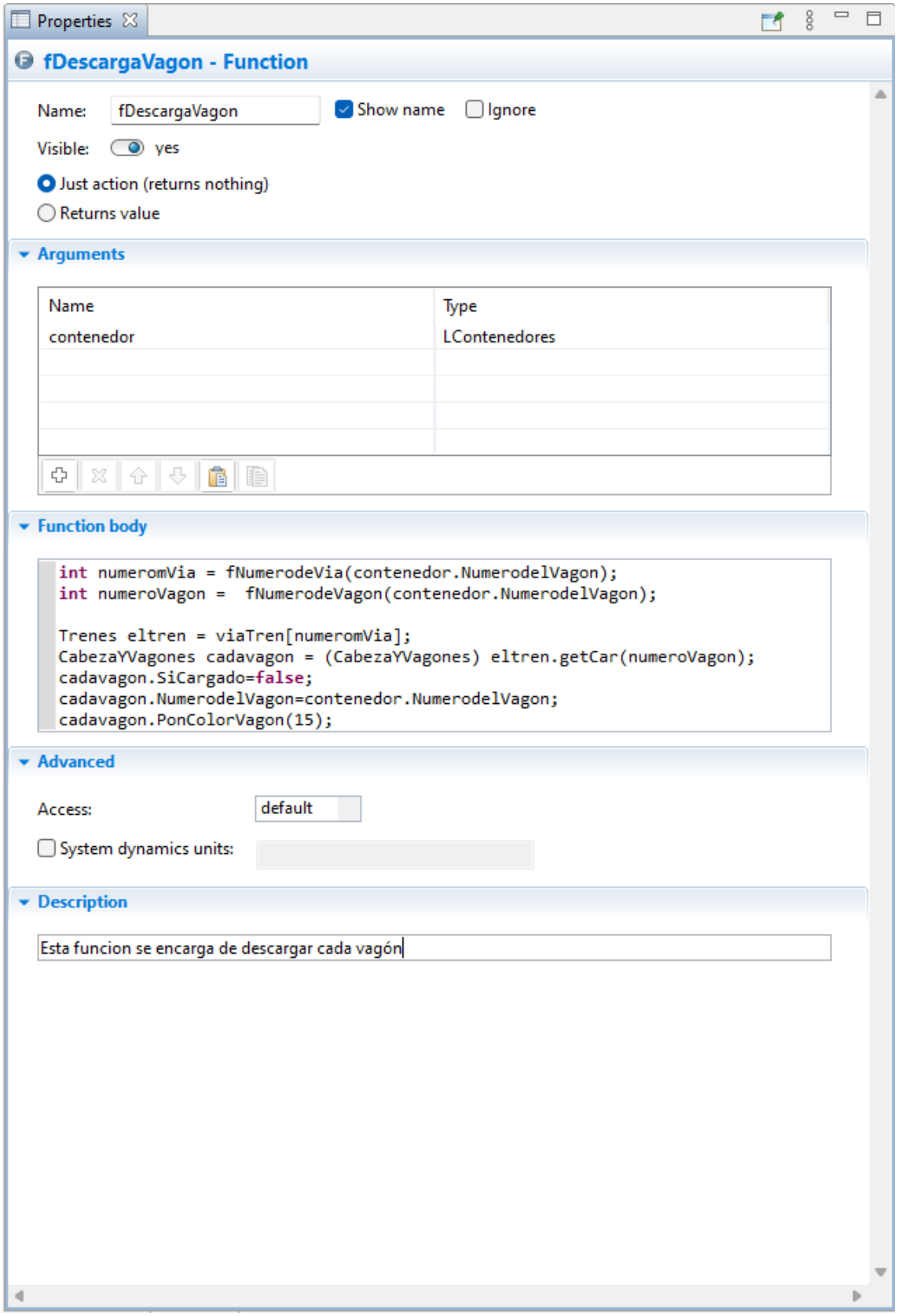
En la descripción se encuentra lo que hace cada función. Como vemos en cada función tenemos una opción que hace que la función devuelva algún valor (returns value), y (Just action) que no devuelve ningún valor.

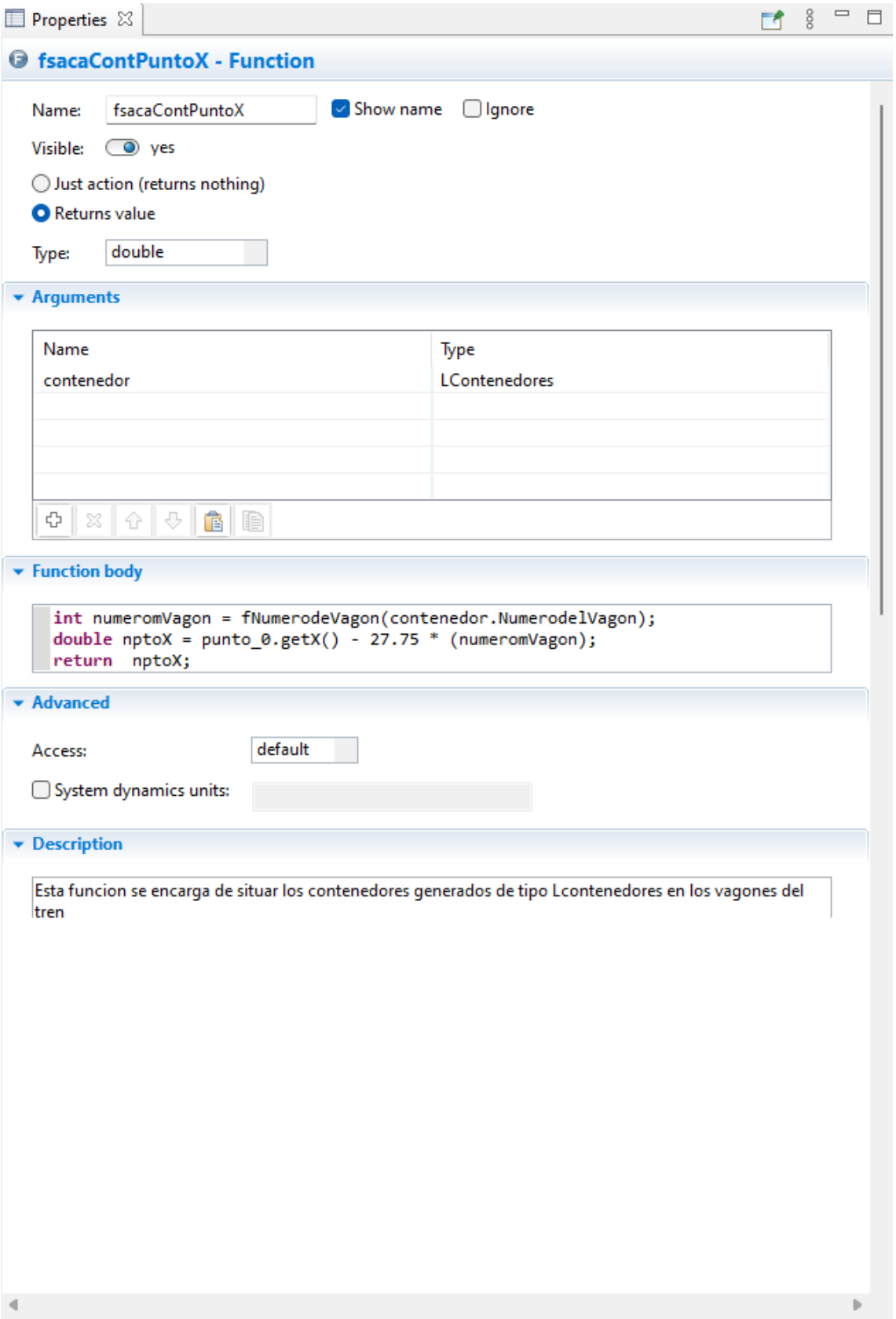


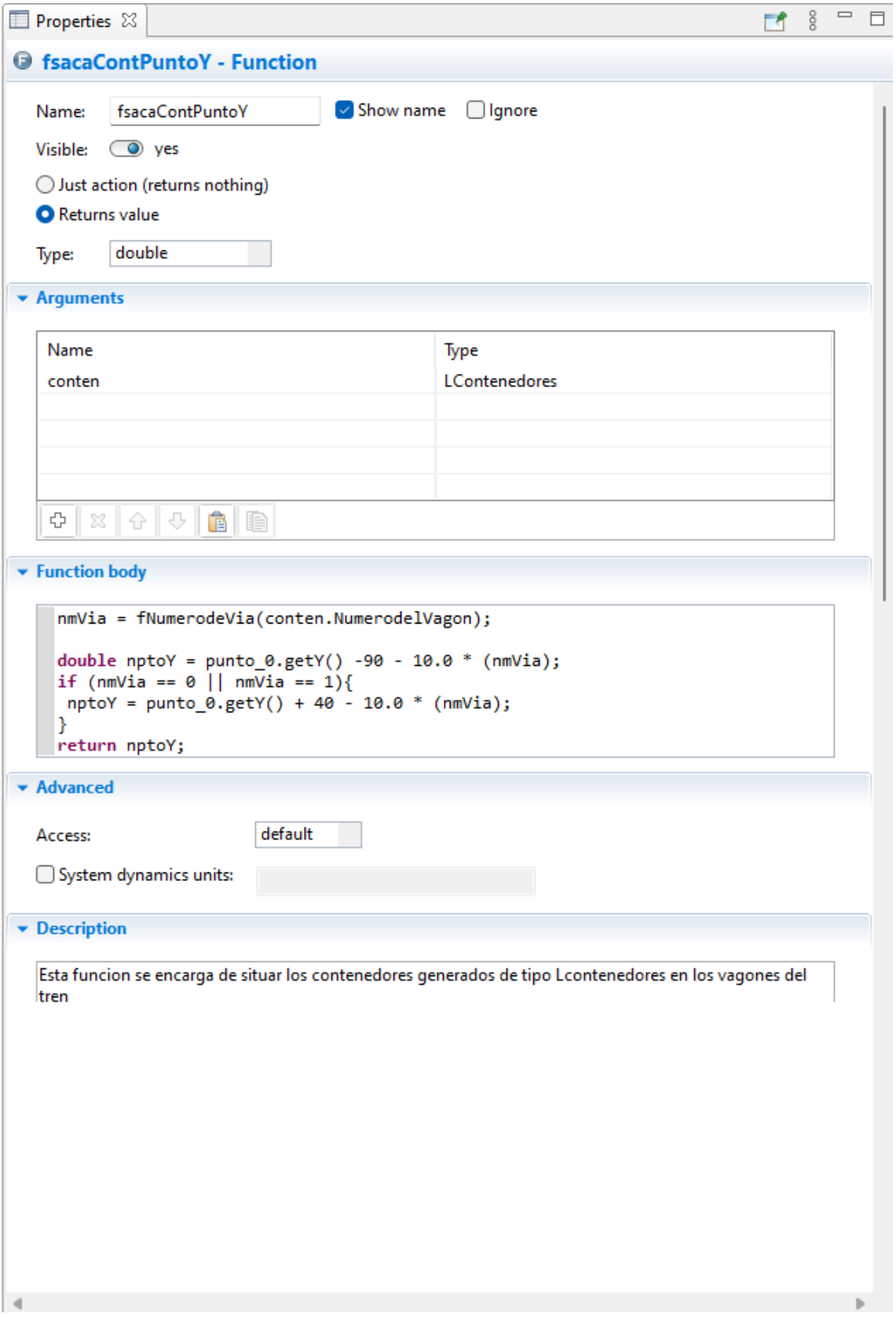

Properties
fOrdenesCorrectas - Function
Name: fOrdenesCorrectas
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: boolean
Arguments
Name
Type
orden
LeeListadeExcel
Function body
CabezaYVagones elVagon = fbuscaVagon(orden.vagon);
return (!(elVagon==null));
Advanced
Access: default
System dynamics units:
Description
Esta función se encarga de comprobar mediante la funcion fbuscavagon si el vagón tiene las ordenes correctas si no devuelve fallo.

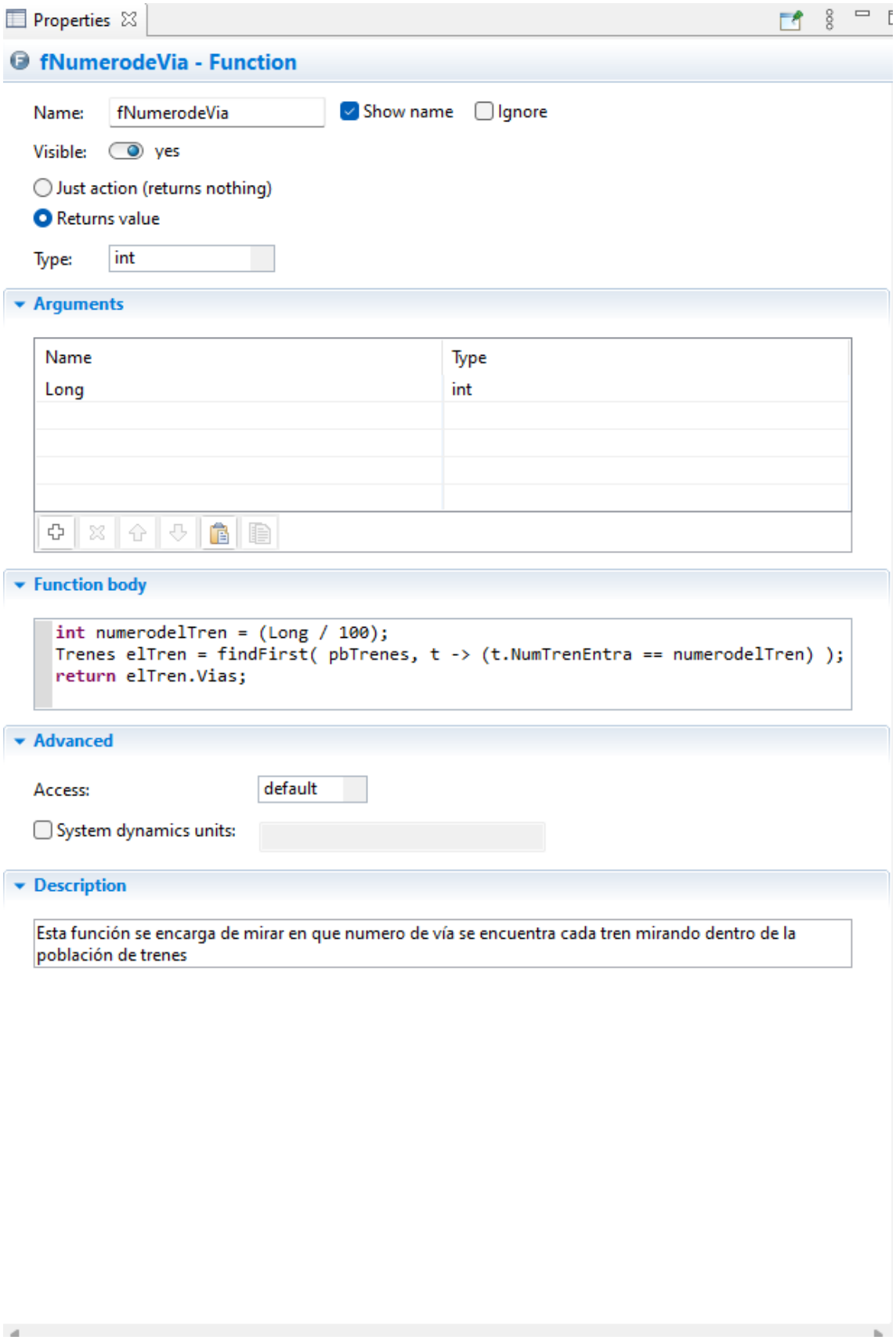

Properties
fCreaVagon - Function
Name: fCreaVagon
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Arguments
Name
Type
vagon
CabezaYVagones
posicionvagon
int
Function body
LeeListadeExcel odSel;
int numerodelTren = ContadorTrenEntra;
int Long = (numerodelTren * 100) + posicionvagon;
vagon.setWidth(6);
vagon.NumerodelVagon = Long;
vagon.esLocomotora = (posicionvagon == 0);
vagon.SiCargado = false;
if (posicionvagon == 0) {
vagon.PonColorVagon(0);
vagon.car1d.setFillColor(black);
} else {
odSel = fbuscaOrden(vagon.NumerodelVagon);
if (!(odSel==null)){
vagon.SiCargado = true;
vagon.PonColorVagon(odSel.vgColor);
vagon.OrdenVagon = odSel;
};
}
Advanced
Access: default
System dynamics units:
Description
Crea un vagón de tren en TrainSource con el color indicado en el fichero excel de origen y con la longuitud asignada mediante los parametros

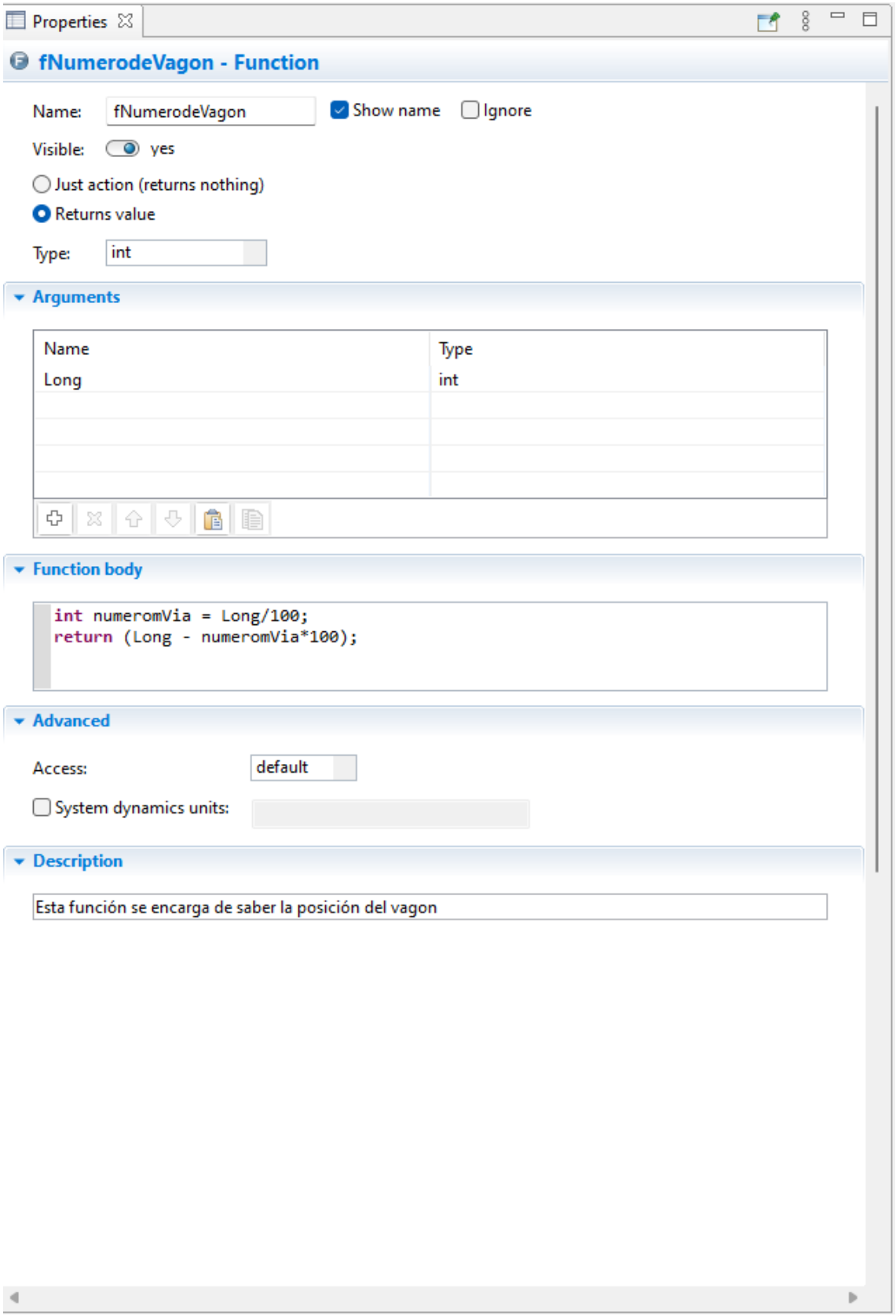

Properties
fNumerodelTren - Function
Name: fNumerodelTren
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: int
Arguments
Name
Type
Long
int
Function body
return (Long / 100);
Advanced
Access: default
System dynamics units:
Description
Esta funcion se encarga de saber mediante el numero del vagón en que tren estamos dividiendo para /100 para lograr ver su centena

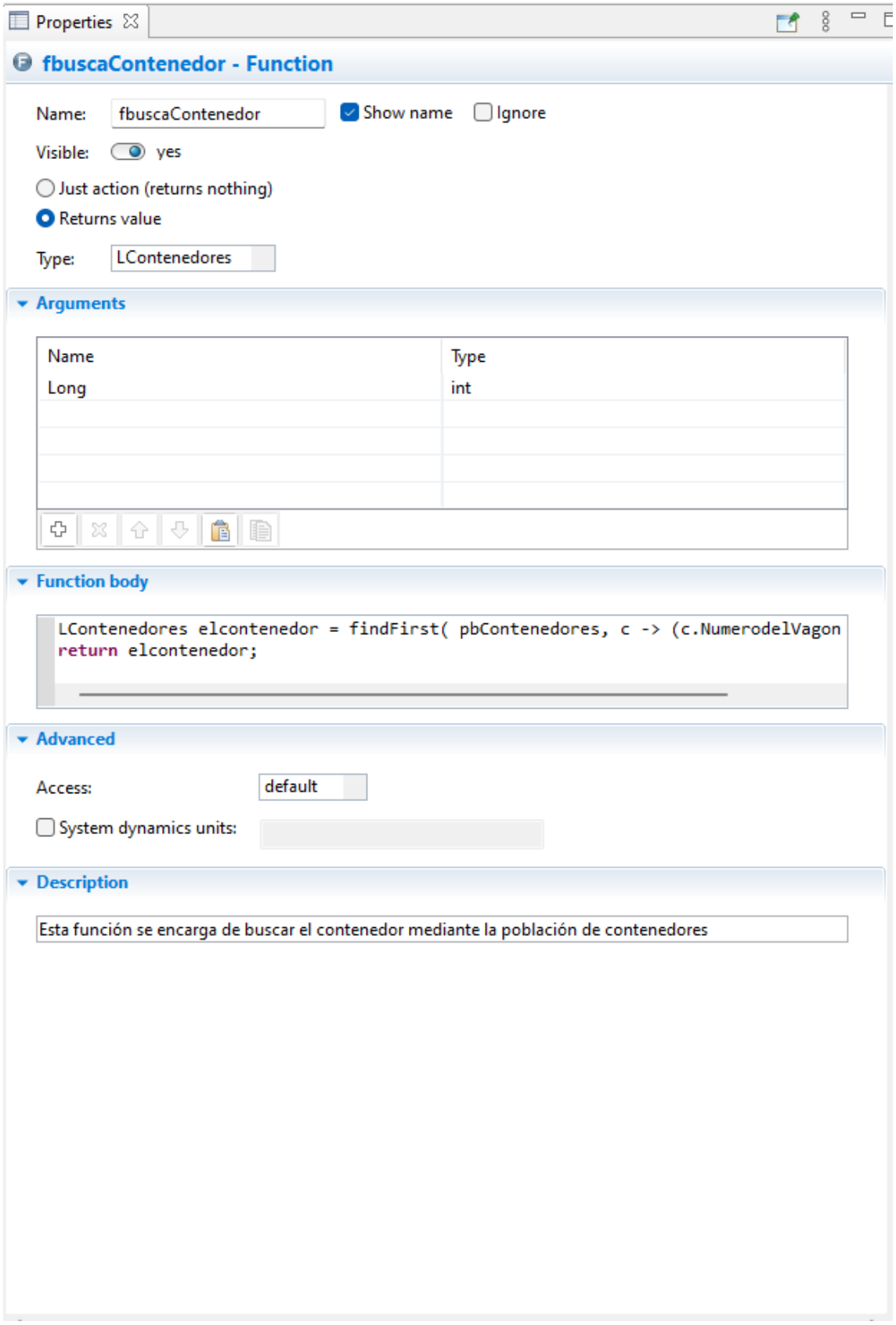

Properties
fDescargaVagon - Function
Name: fDescargaVagon
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Arguments
Name
Type
contenedor
LContenedores
Function body
int numeromVia = fNumerodeVia(contenedor.NumerodelVagon);
int numeroVagon = fNumerodeVagon(contenedor.NumerodelVagon);
Trenes eltren = viaTren[numeromVia];
CabezaYVagones cadavagon = (CabezaYVagones) eltren.getCar(numeroVagon);
cadavagon.SiCargado=false;
cadavagon.NumerodelVagon=contenedor.NumerodelVagon;
cadavagon.PonColorVagon(15);
Advanced
Access: default
System dynamics units:
Description
Esta funcion se encarga de descargar cada vagón

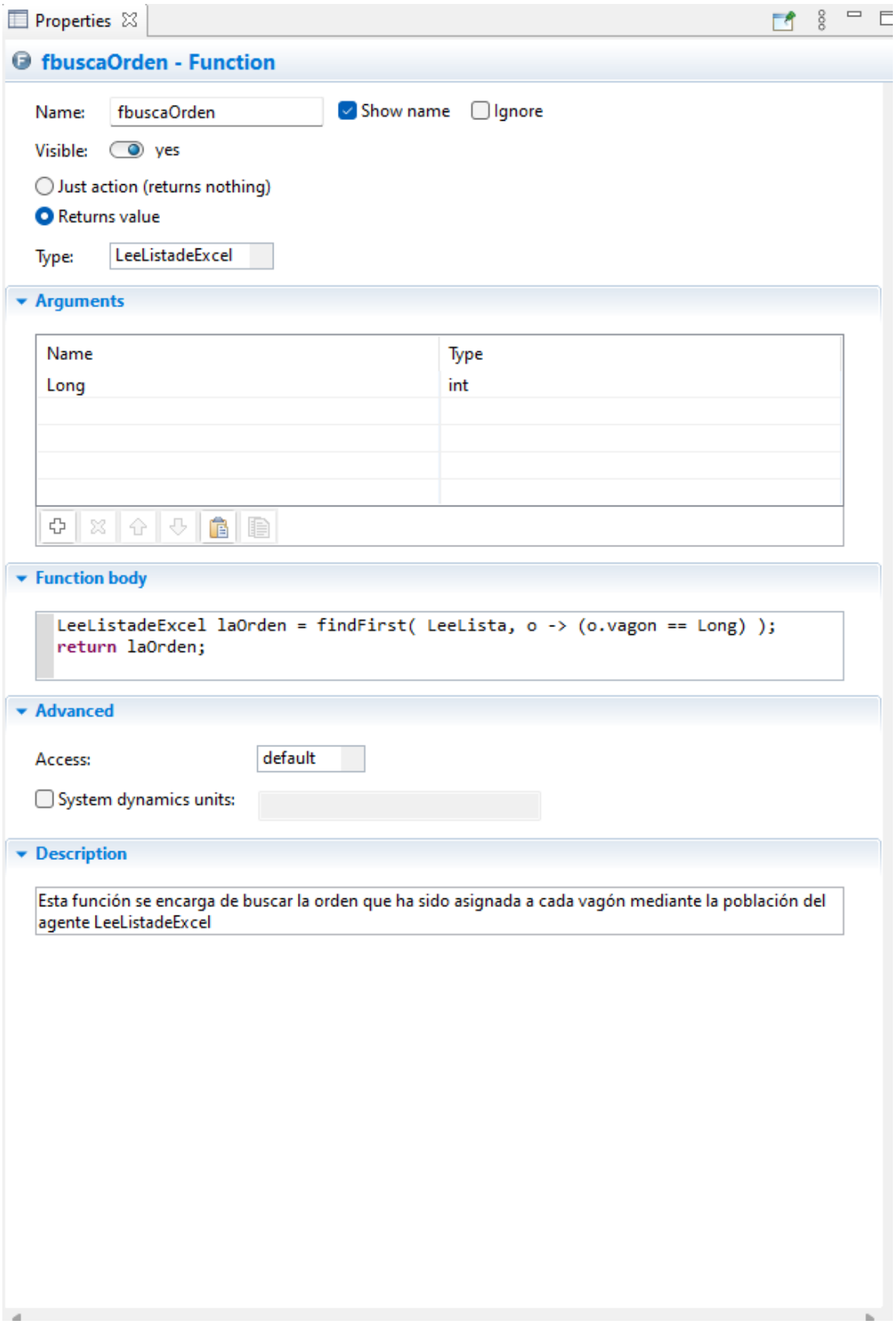

Properties
fsacaContPuntoX - Function
Name: fsacaContPuntoX
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: double
Arguments
Name
Type
contenedor
LContenedores
Function body
int numeromVagon = fNumerodeVagon(contenedor.NumerodelVagon);
double nptoX = punto_0.getX() - 27.75 * (numeromVagon);
return nptoX;
Advanced
Access: default
System dynamics units:
Description
Esta funcion se encarga de situar los contenedores generados de tipo Lcontenedores en los vagones del tren

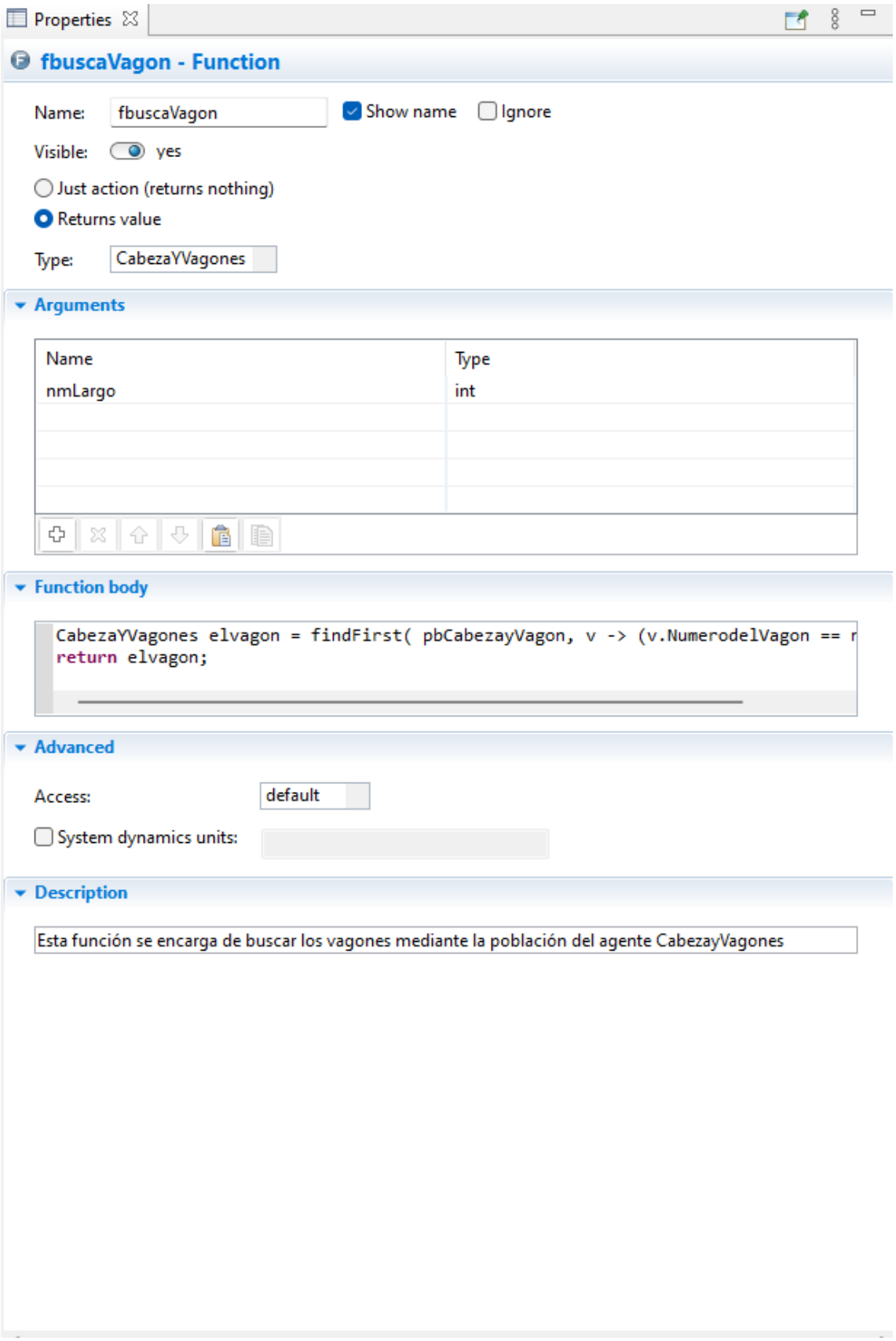

Properties
fsacaContPuntoY - Function
Name: fsacaContPuntoY
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: double
Arguments
Name
Type
conten
LContenedores
Function body
nmVia = fNumerodeVia(conten.NumerodelVagon);
double nptoY = punto_0.getY() -90 - 10.0 * (nmVia);
if (nmVia == 0 || nmVia == 1){
nptoY = punto_0.getY() + 40 - 10.0 * (nmVia);
}
return nptoY;
Advanced
Access: default
System dynamics units:
Description
Esta funcion se encarga de situar los contenedores generados de tipo Lcontenedores en los vagones del tren

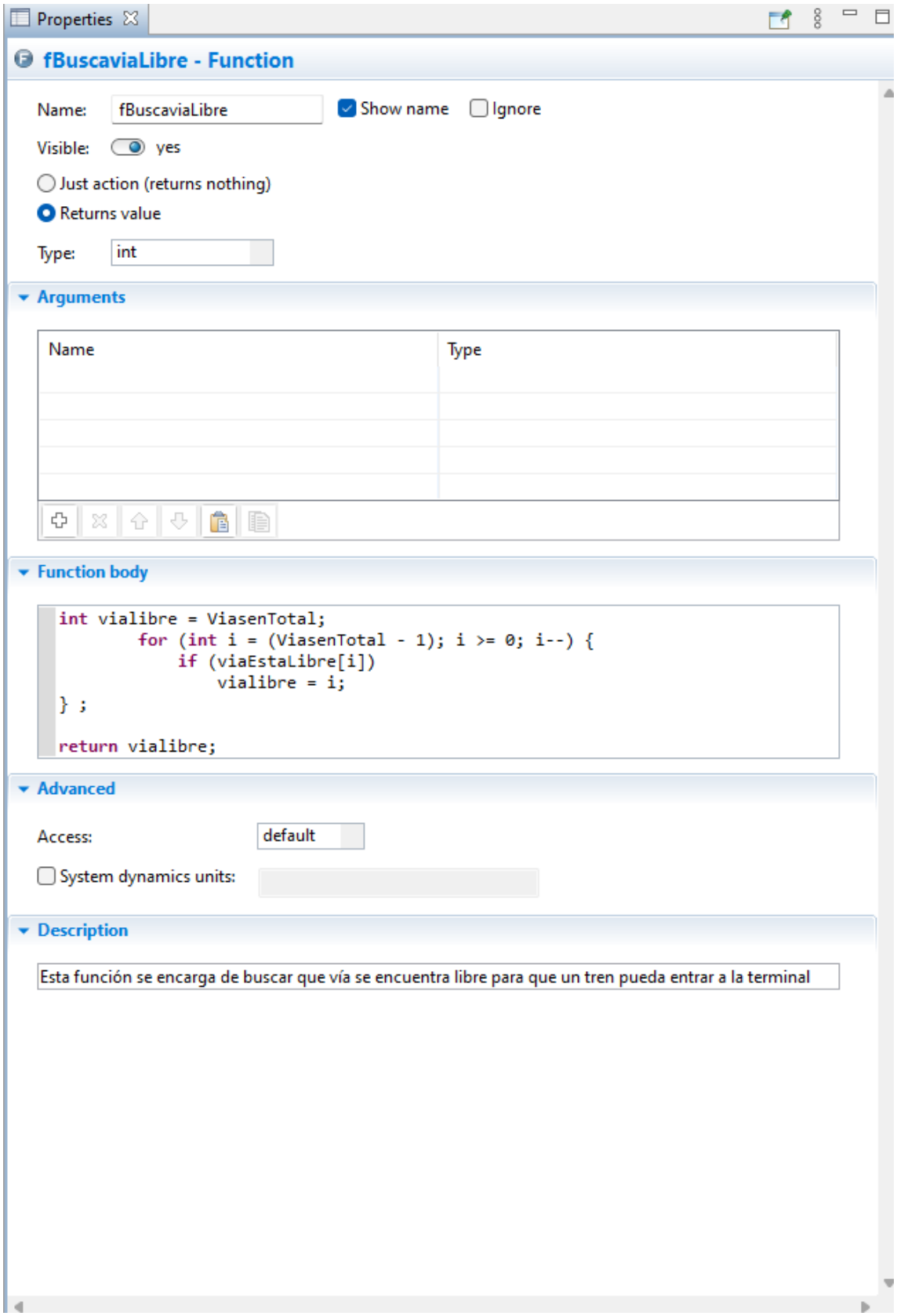

Properties
fNumerodeVia - Function
Name: fNumerodeVia
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: int
Arguments
Name
Type
Long
int
Function body
int numerodelTren = (Long / 100);
Trenes elTren = findFirst(pbTrenes, t -> (t.NumTrenEntra == numerodelTren));
return elTren.Vias;
Advanced
Access: default
System dynamics units:
Description
Esta función se encarga de mirar en que numero de vía se encuentra cada tren mirando dentro de la población de trenes

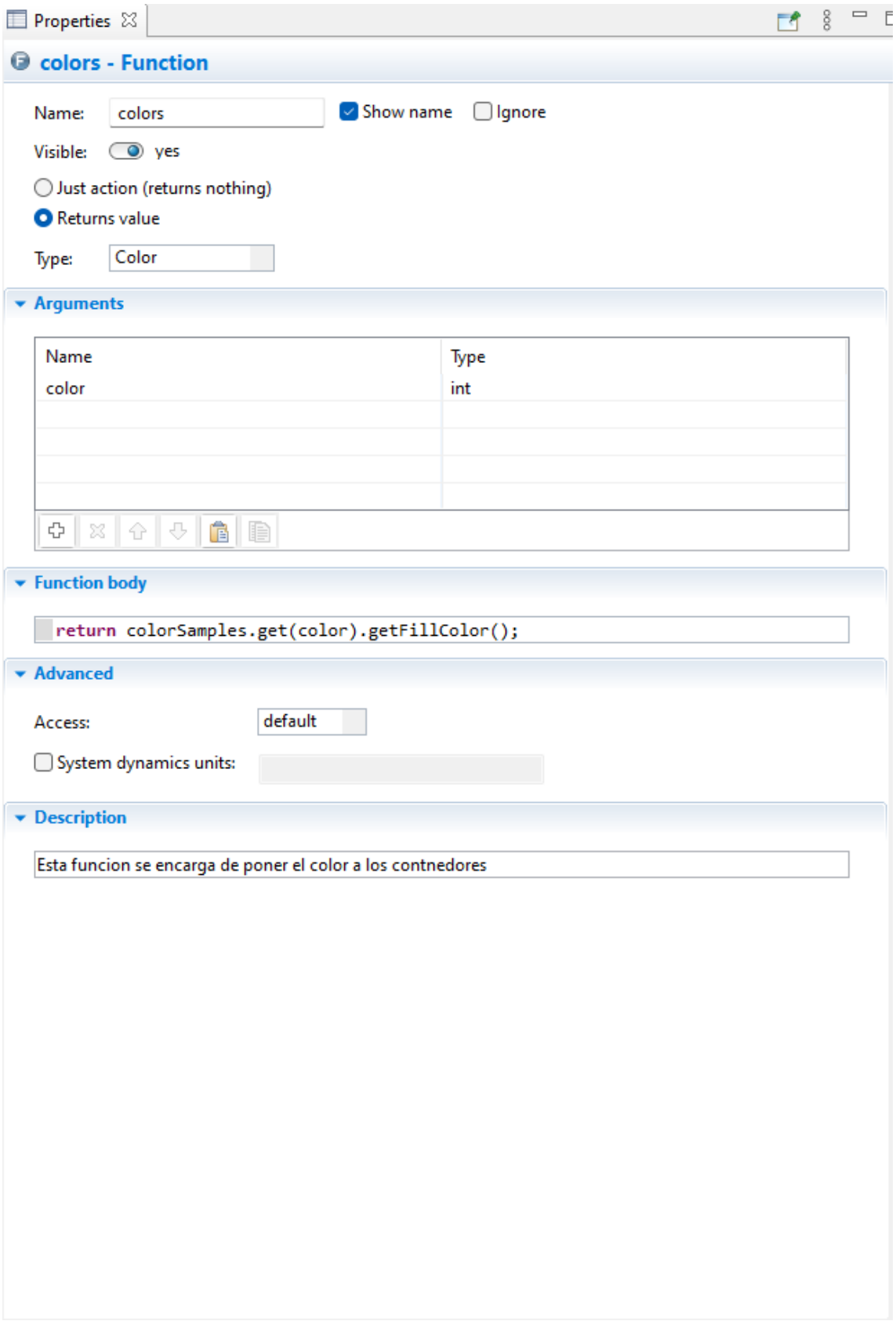

Properties
fNumerodeVagon - Function
Name: fNumerodeVagon
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: int
Arguments
Name
Type
Long
int
Function body
int numeromVia = Long/100;
return (Long - numeromVia*100);
Advanced
Access: default
System dynamics units:
Description
Esta función se encarga de saber la posición del vagon


Properties
fbuscaContenedor - Function
Name: fbuscaContenedor
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: LContenedores
Arguments
Name
Type
Long
int
Function body
LContenedores elcontenedor = findFirst(pbContenedores, c -> (c.NumerodelVagon
return elcontenedor;
Advanced
Access: default
System dynamics units:
Description
Esta función se encarga de buscar el contenedor mediante la población de contenedores

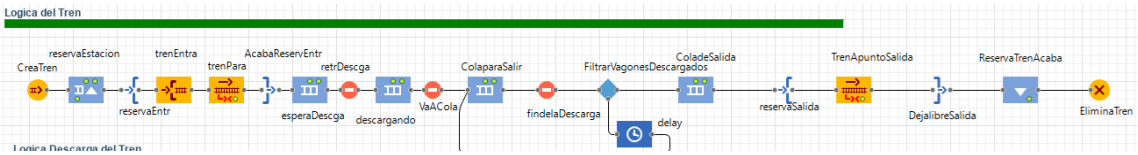

Properties
fbuscaOrden - Function
Name: fbuscaOrden
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: LeeListadeExcel
Arguments
Name
Type
Long
int
Function body
LeeListadeExcel laOrden = findFirst(LeeLista, o -> (o.vagon == Long));
return laOrden;
Advanced
Access: default
System dynamics units:
Description
Esta función se encarga de buscar la orden que ha sido asignada a cada vagón mediante la población del agente LeeListadeExcel

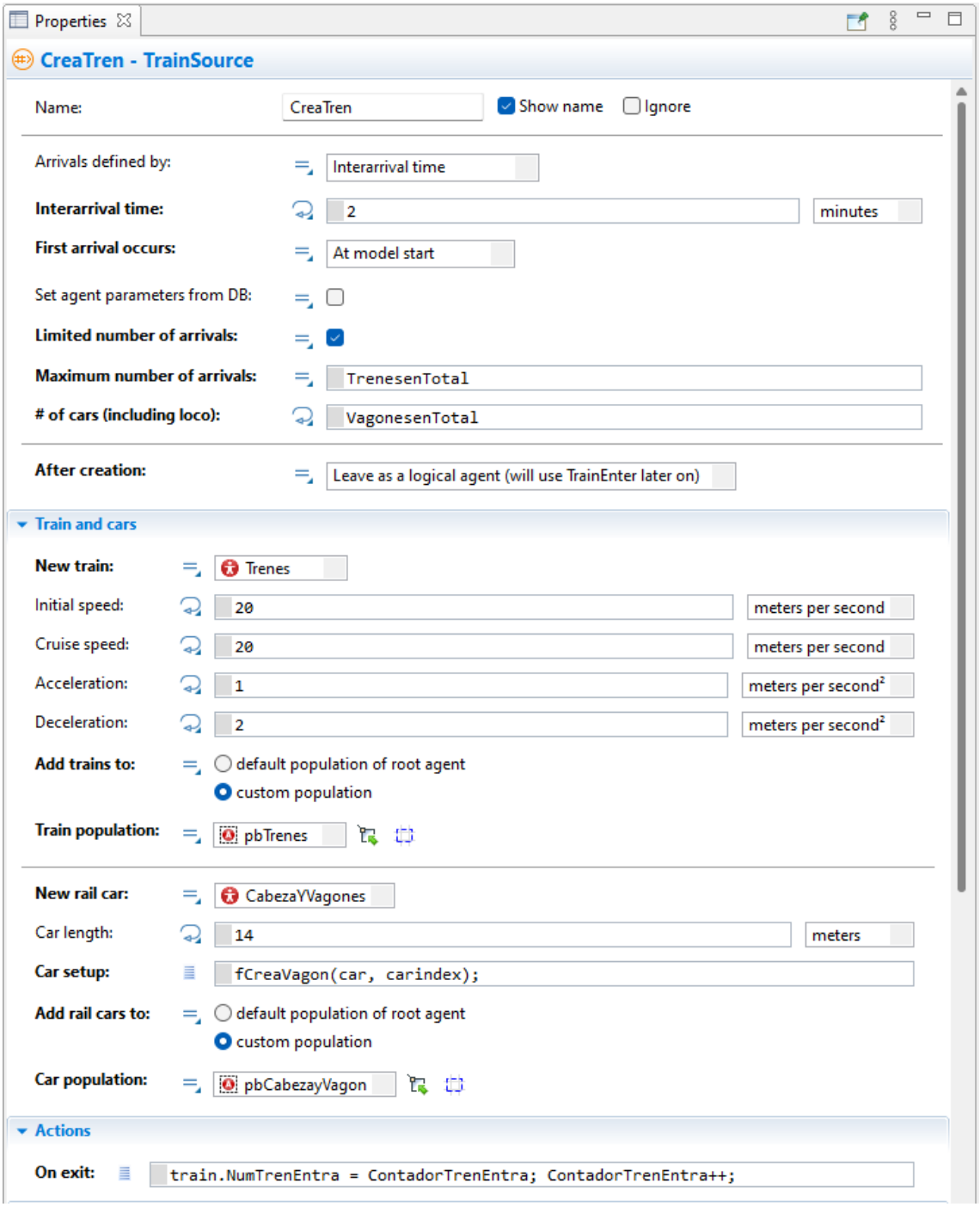

Properties
fbuscaVagon - Function
Name: fbuscaVagon
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: CabezaYVagones
Arguments
Name
Type
nmLargo
int
Function body
CabezaYVagones elvagon = findFirst(pbCabezayVagon, v -> (v.NumerodelVagon == r
return elvagon;
Advanced
Access: default
System dynamics units:
Description
Esta función se encarga de buscar los vagones mediante la población del agente CabezayVagones

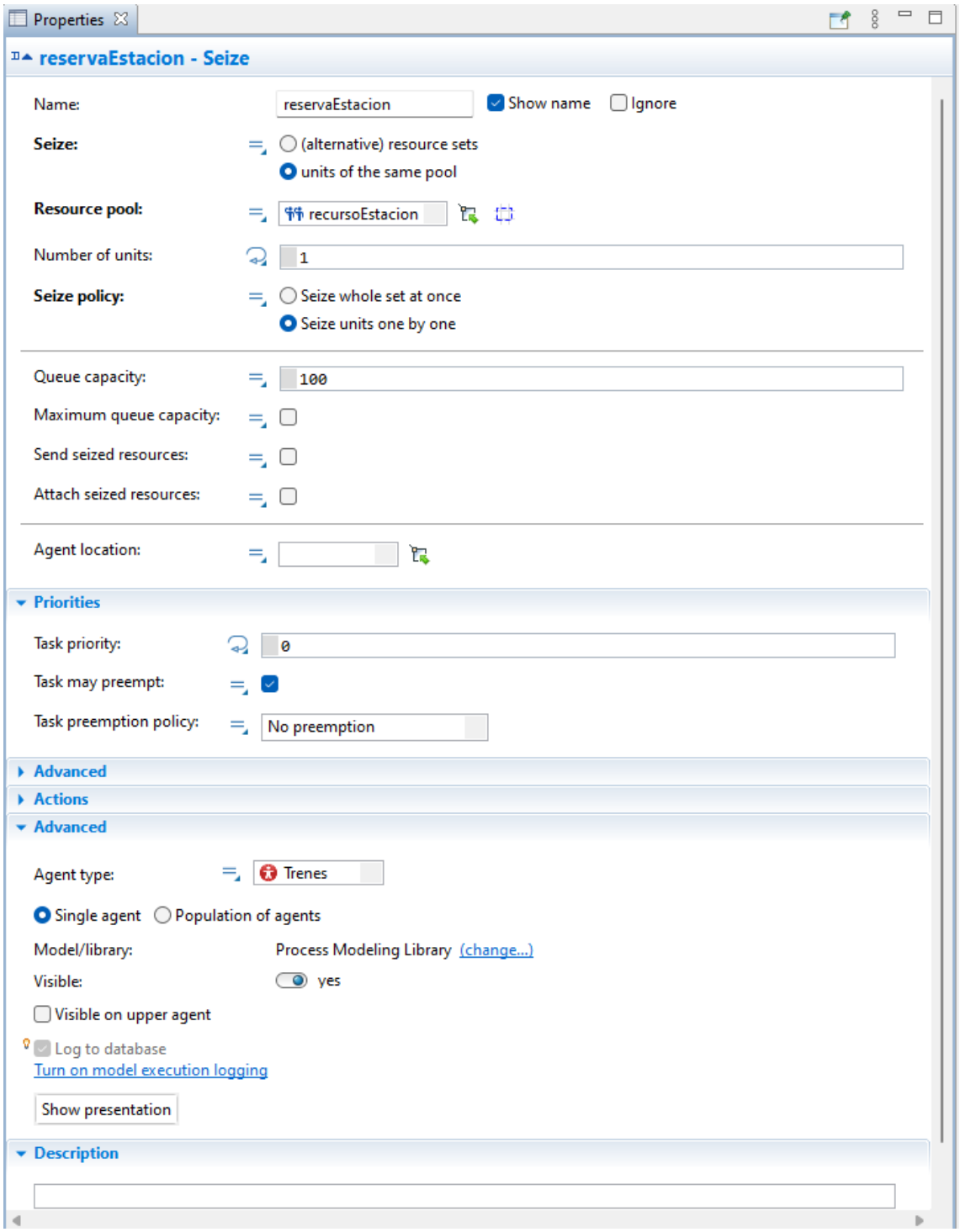

Properties
fBuscaviaLibre - Function
Name: fBuscaviaLibre
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: int
Arguments
Name
Type
Function body
int vialibre = ViasenTotal;
for (int i = (ViasenTotal - 1); i >= 0; i--) {
if (viaEstaLibre[i])
vialibre = i;
} ;
return vialibre;
Advanced
Access: default
System dynamics units:
Description
Esta función se encarga de buscar que vía se encuentra libre para que un tren pueda entrar a la terminal

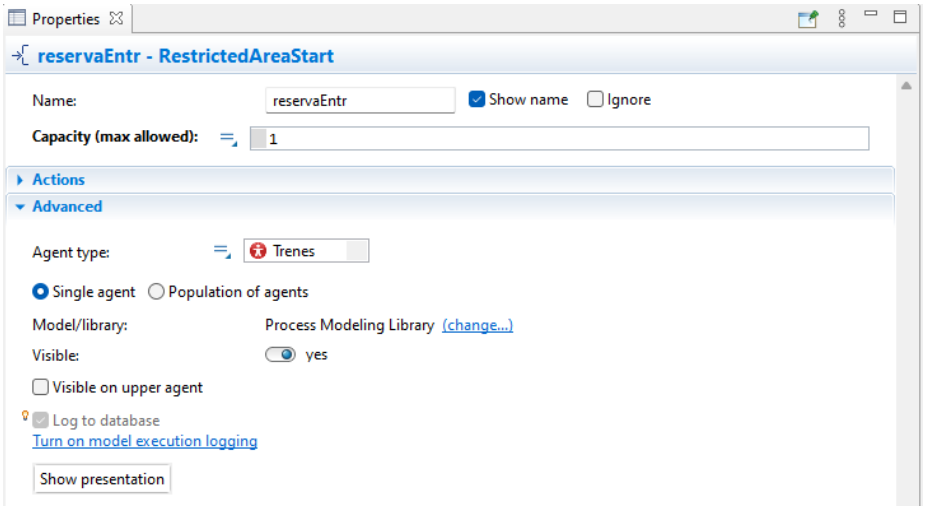

Properties
colors - Function
Name: colors
Show name
Ignore
Visible: yes
Just action (returns nothing)
Returns value
Type: Color
Arguments
Name
Type
color
int
Function body
return colorSamples.get(color).getFillColor();
Advanced
Access: default
System dynamics units:
Description
Esta funcion se encarga de poner el color a los contnedores

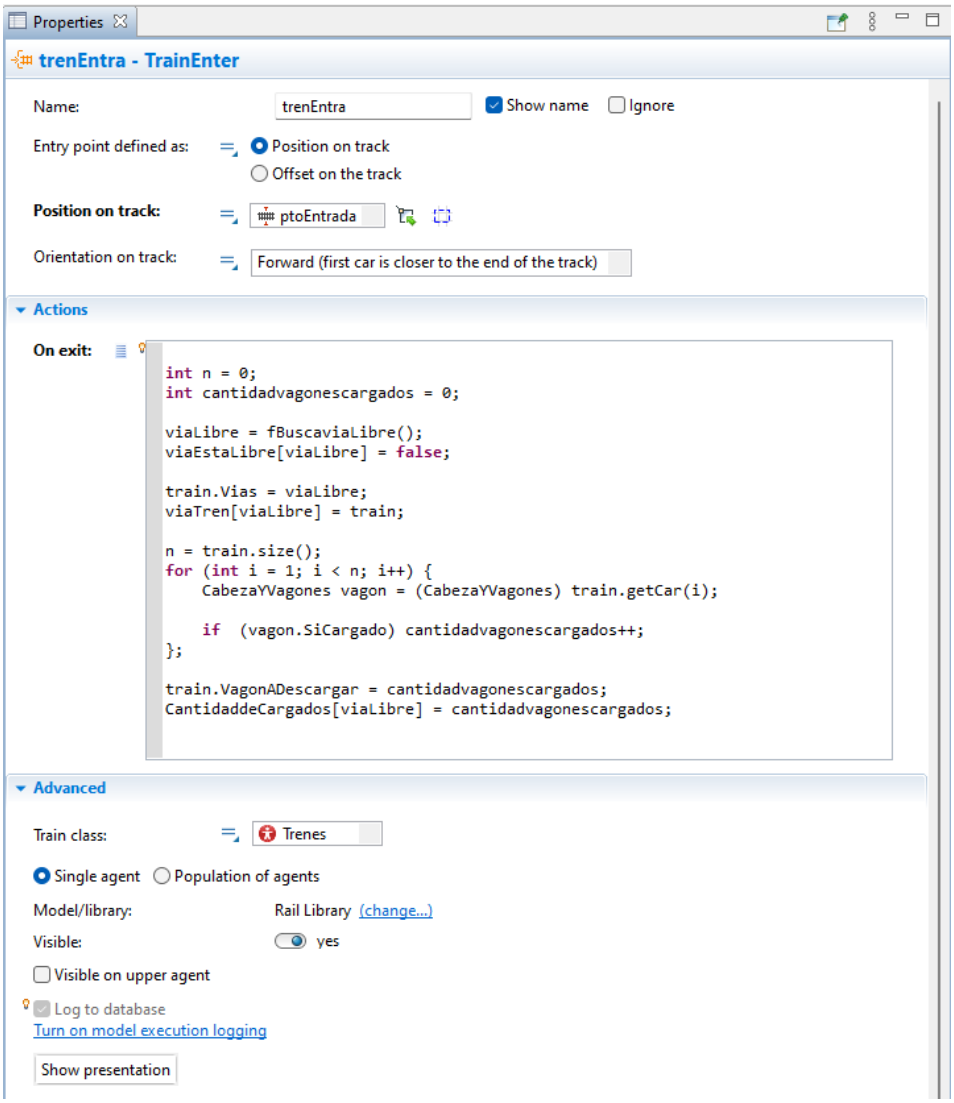
ANEXO 5: LÓGICA DEL TREN

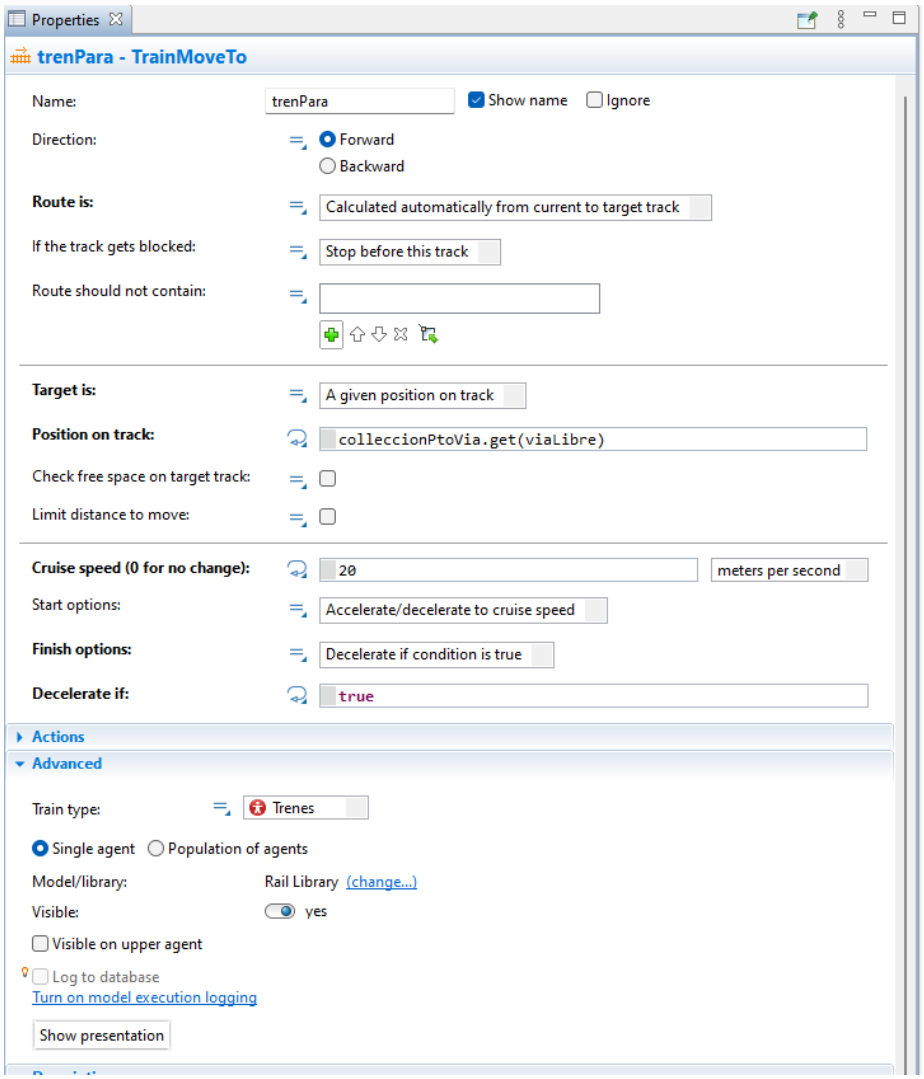


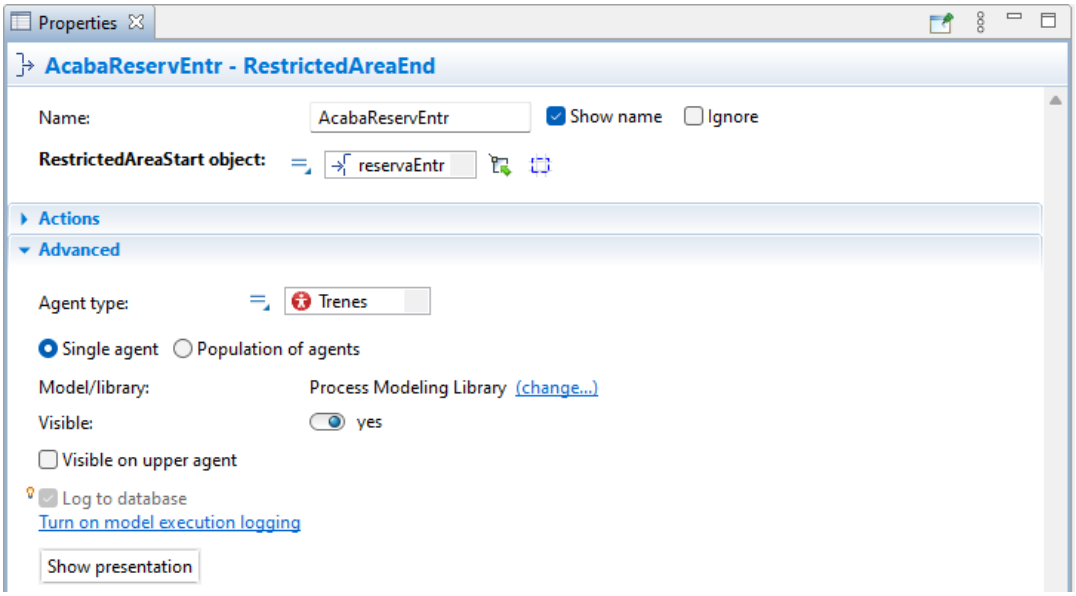


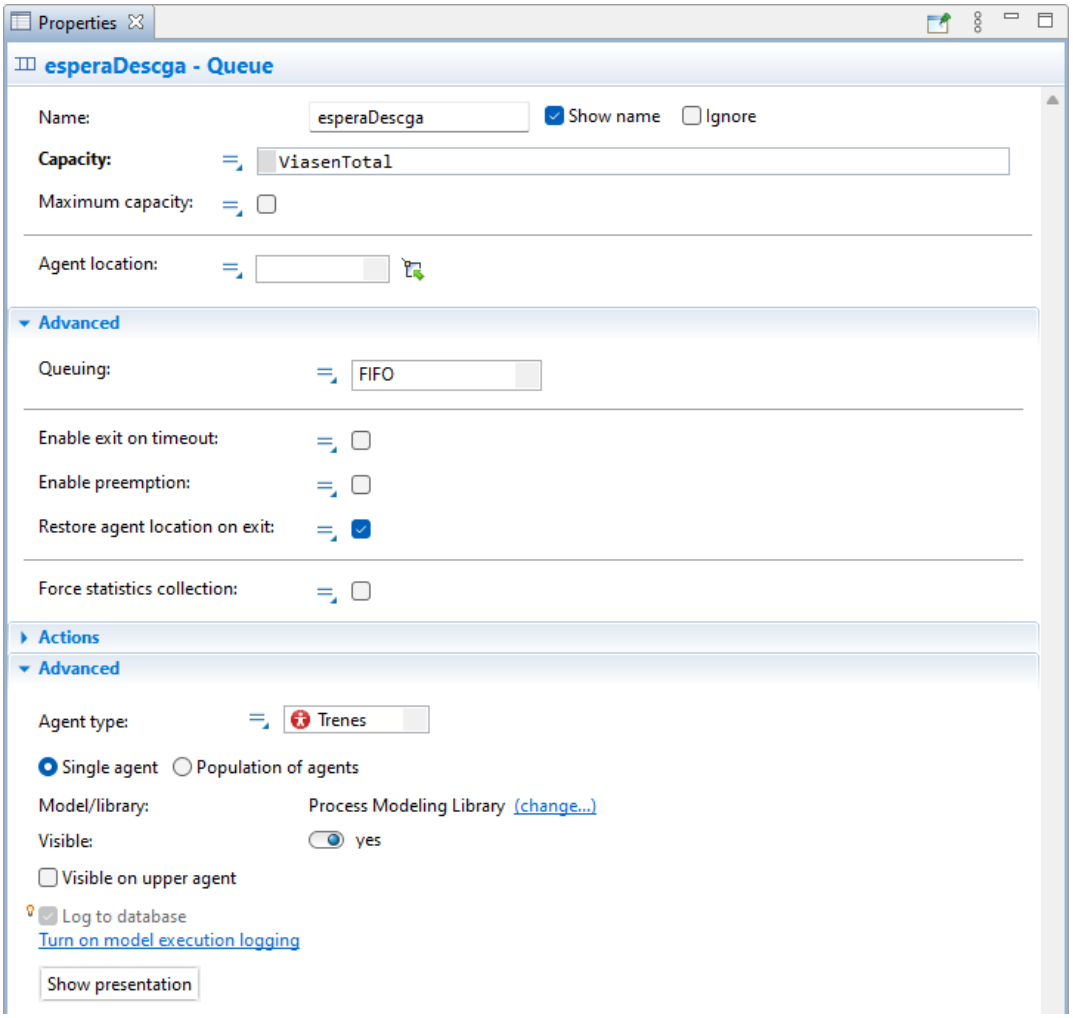

Properties
reservaEstacion - Seize
Name:
reservaEstacion
Show name
Ignore
Seize:
(alternative) resource sets
units of the same pool
Resource pool:
recursoEstacion
Number of units:
1
Seize policy:
Seize whole set at once
Seize units one by one
Queue capacity:
100
Maximum queue capacity:
Send seized resources:
Attach seized resources:
Agent location:
Priorities
Task priority:
0
Task may preempt:
Task preemption policy:
No preemption
Advanced
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation
Description

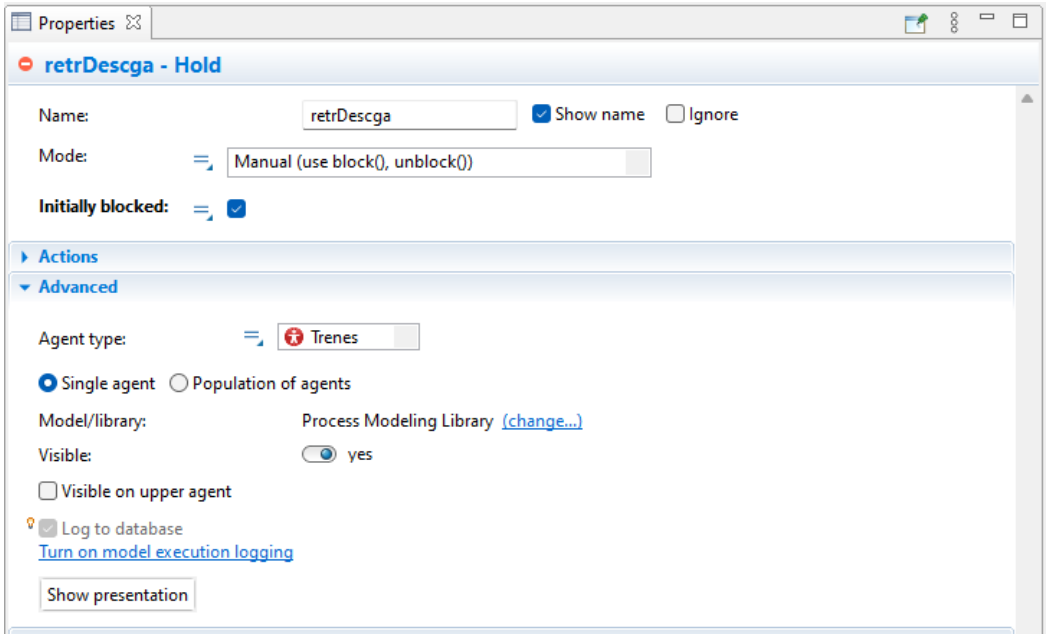

Properties
reservaEntr - RestrictedAreaStart
Name:
reservaEntr
Show name
Ignore
Capacity (max allowed):
1
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

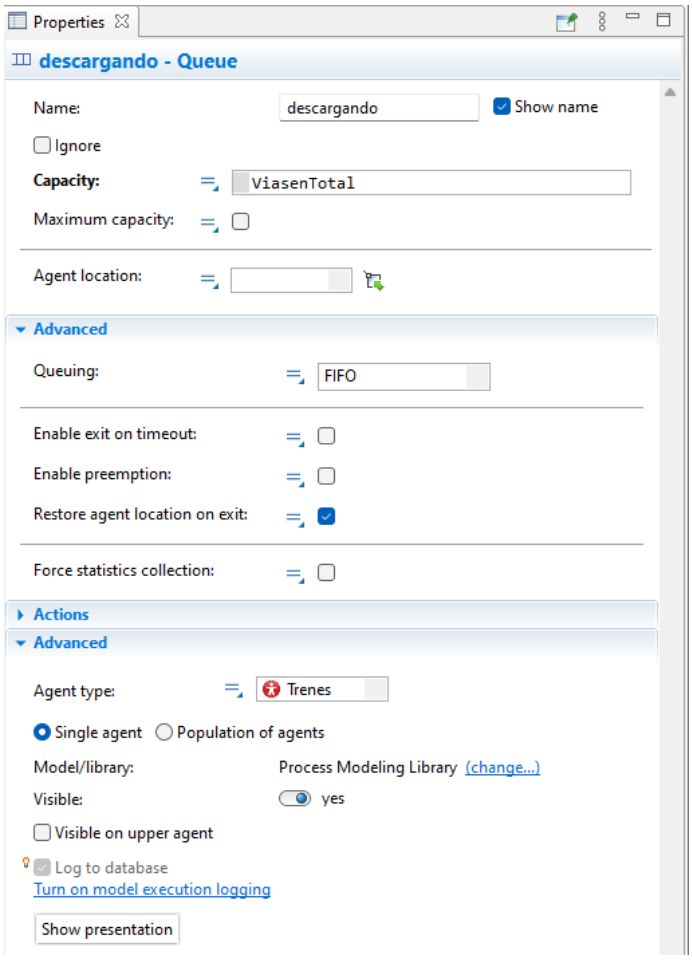

Properties
trenEntra - TrainEnter
Name:
trenEntra
Show name
Ignore
Entry point defined as:
Position on track
Offset on the track
Position on track:
ptoEntrada
Orientation on track:
Forward (first car is closer to the end of the track)
Actions
On exit:
int n = 0;
int cantidadvagonescargados = 0;
viaLibre = fBuscaviaLibre();
viaEstaLibre[viaLibre] = false;
train.Vias = viaLibre;
viaTren[viaLibre] = train;
n = train.size();
for (int i = 1; i < n; i++) {
CabezaYVagones vagon = (CabezaYVagones) train.getCar(i);
if (vagon.SiCargado) cantidadvagonescargados++;
};
train.VagonADescargar = cantidadvagonescargados;
CantidaddeCargados[viaLibre] = cantidadvagonescargados;
Advanced
Train class:
Trenes
Single agent
Population of agents
Model/library:
Rail Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

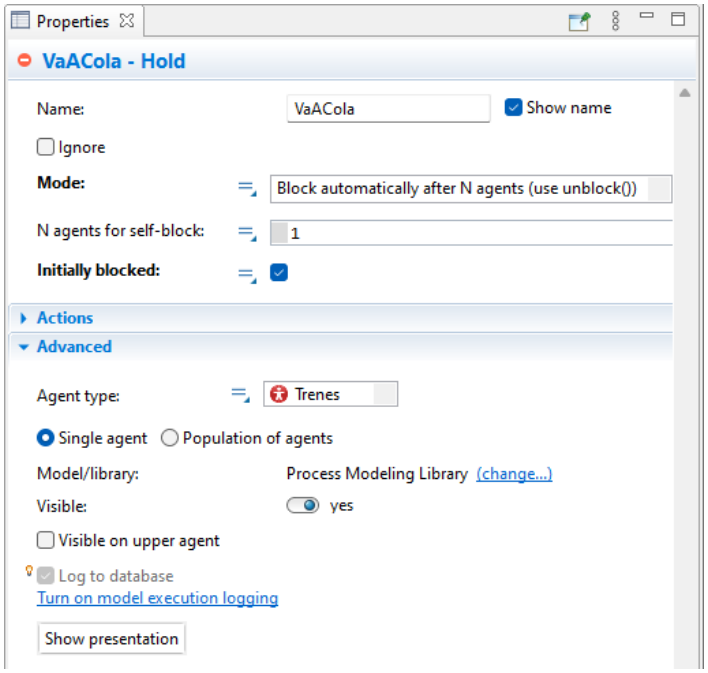

Properties
trenPara - TrainMoveTo
Name:
trenPara
Show name
Ignore
Direction:
Forward
Backward
Route is:
Calculated automatically from current to target track
If the track gets blocked:
Stop before this track
Route should not contain:
Target is:
A given position on track
Position on track:
colleccionPtoVia.get(viaLibre)
Check free space on target track:
Limit distance to move:
Cruise speed (0 for no change):
20
meters per second
Start options:
Accelerate/decelerate to cruise speed
Finish options:
Decelerate if condition is true
Decelerate if:
true
Actions
Advanced
Train type:
Trenes
Single agent
Population of agents
Model/library:
Rail Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

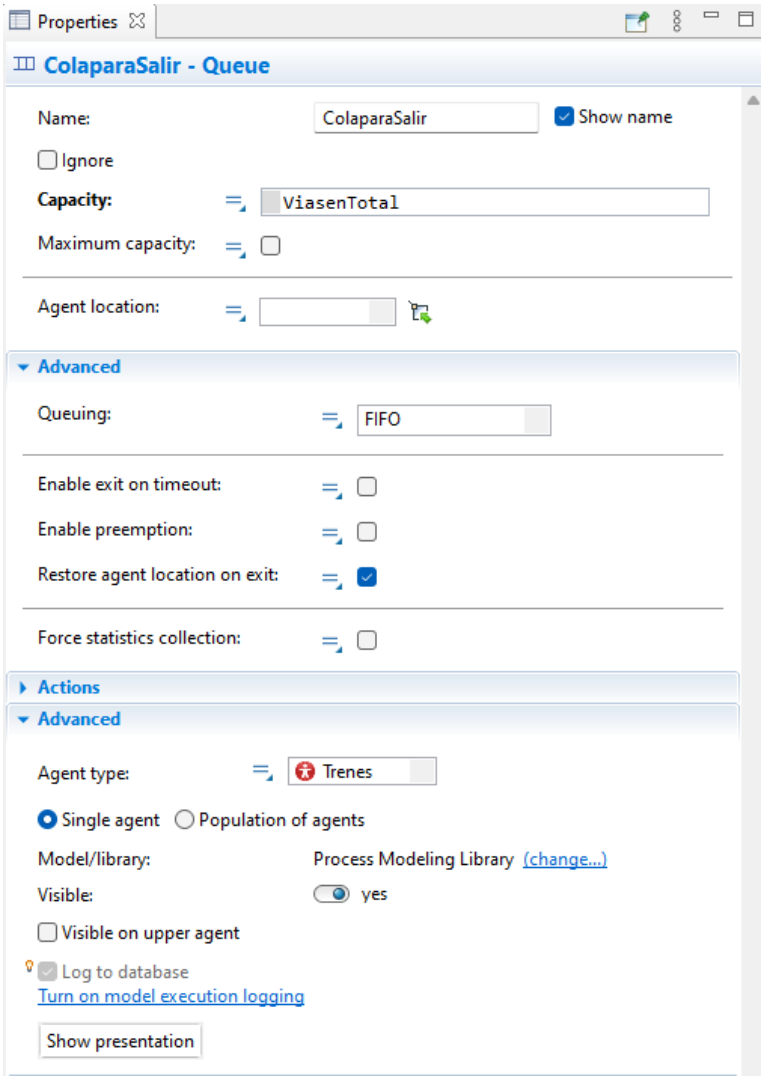

Properties
AcabaReservEntr - RestrictedAreaEnd
Name:
AcabaReservEntr
Show name
Ignore
RestrictedAreaStart object:
reservaEntr
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

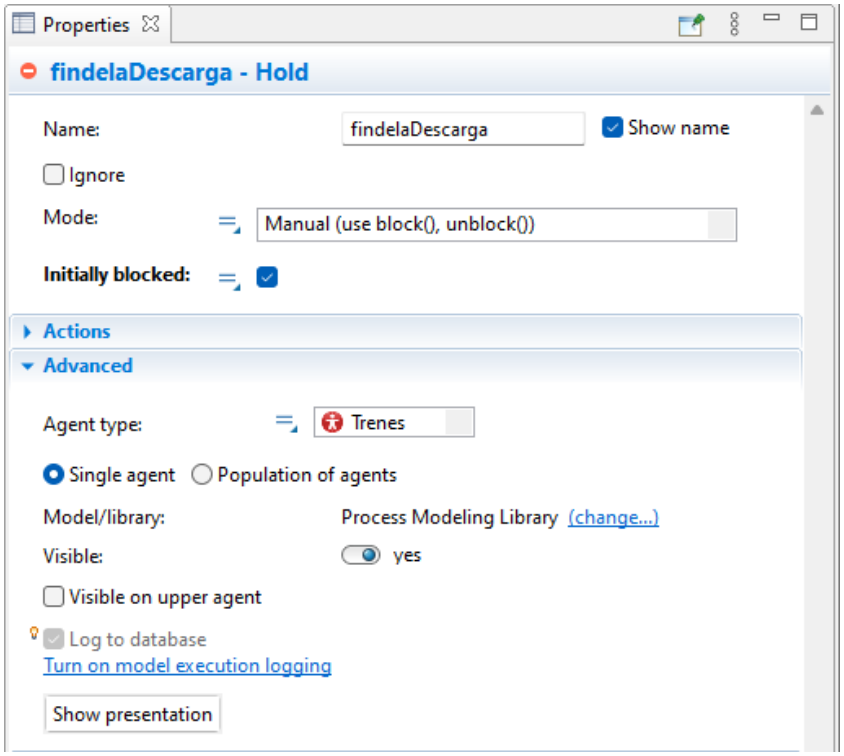

Properties
esperaDescga - Queue
Name:
esperaDescga
Show name
Ignore
Capacity:
ViasenTotal
Maximum capacity:
Agent location:
Advanced
Queuing:
FIFO
Enable exit on timeout:
Enable preemption:
Restore agent location on exit:
Force statistics collection:
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

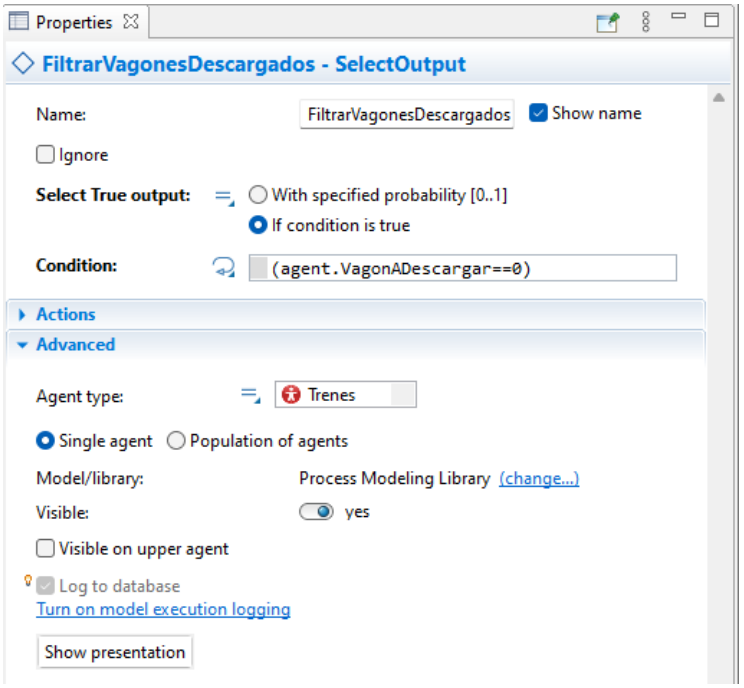

Properties
retrDescga - Hold
Name:
retrDescga
Show name
Ignore
Mode:
Manual (use block(), unblock())
Initially blocked:
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

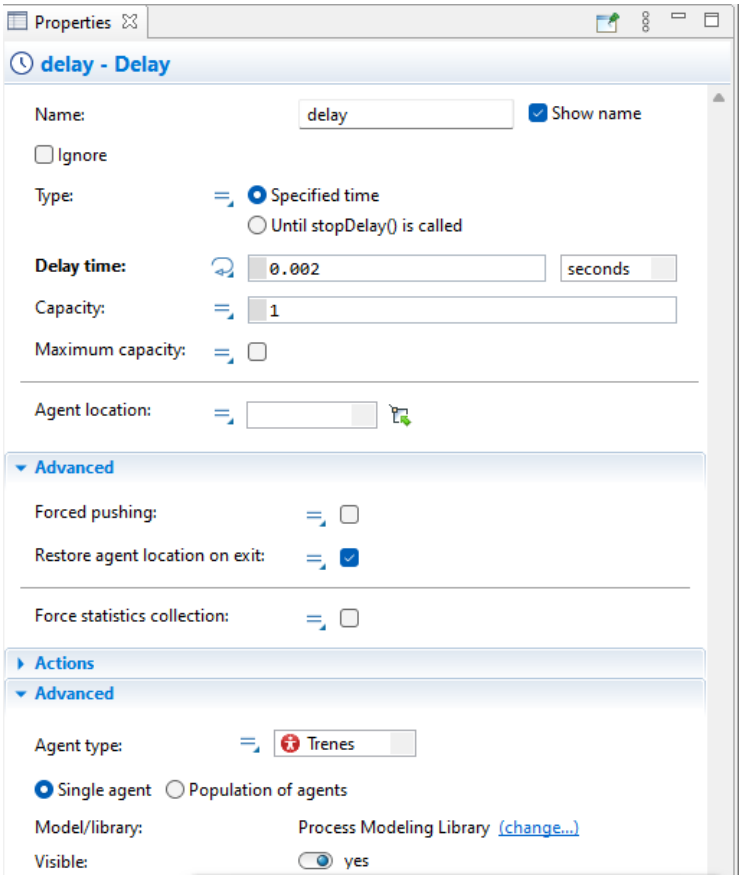

Properties
descargando - Queue
Name:
descargando
Show name
Ignore
Capacity:
ViasenTotal
Maximum capacity:
Agent location:
Advanced
Queuing:
FIFO
Enable exit on timeout:
Enable preemption:
Restore agent location on exit:
Force statistics collection:
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

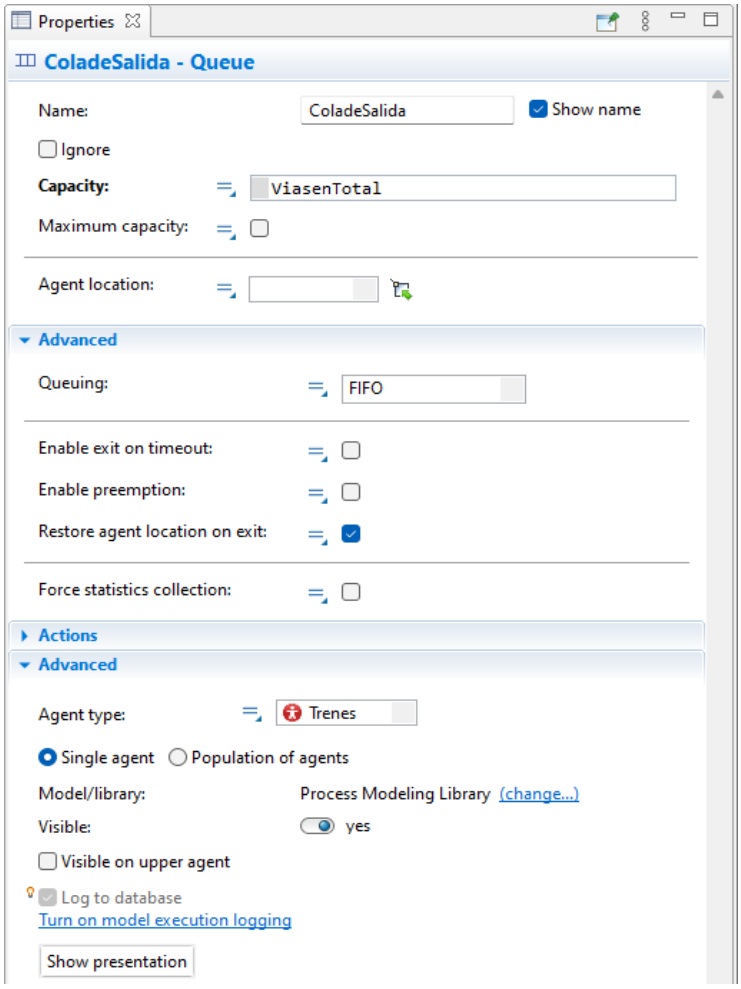

Properties
VaACola - Hold
Name:
VaACola
Show name
Ignore
Mode:
Block automatically after N agents (use unblock())
N agents for self-block:
1
Initially blocked:
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library (change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

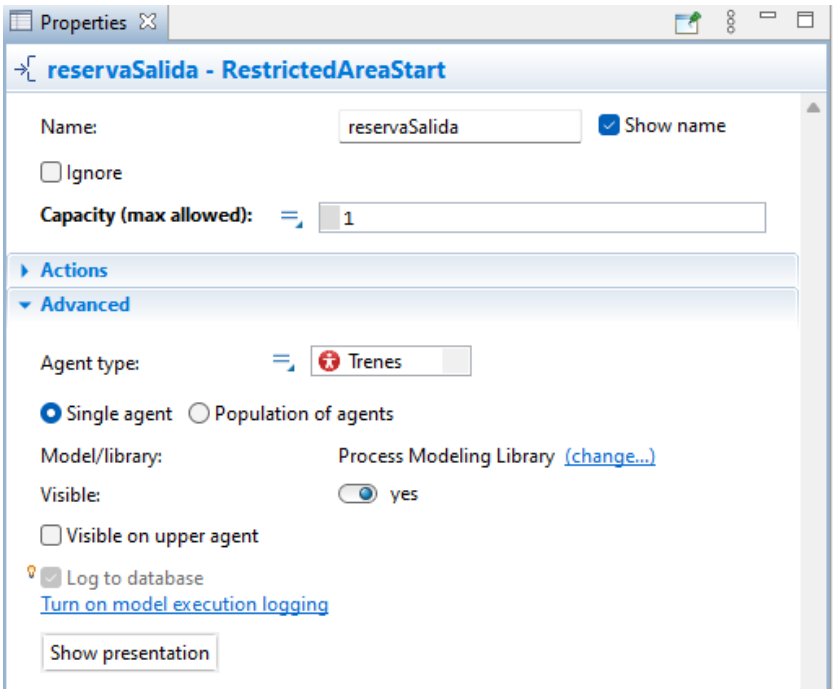

Properties
ColaparaSalir - Queue
Name:
ColaparaSalir
Show name
Ignore
Capacity:
ViasenTotal
Maximum capacity:
Agent location:
Advanced
Queuing:
FIFO
Enable exit on timeout:
Enable preemption:
Restore agent location on exit:
Force statistics collection:
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

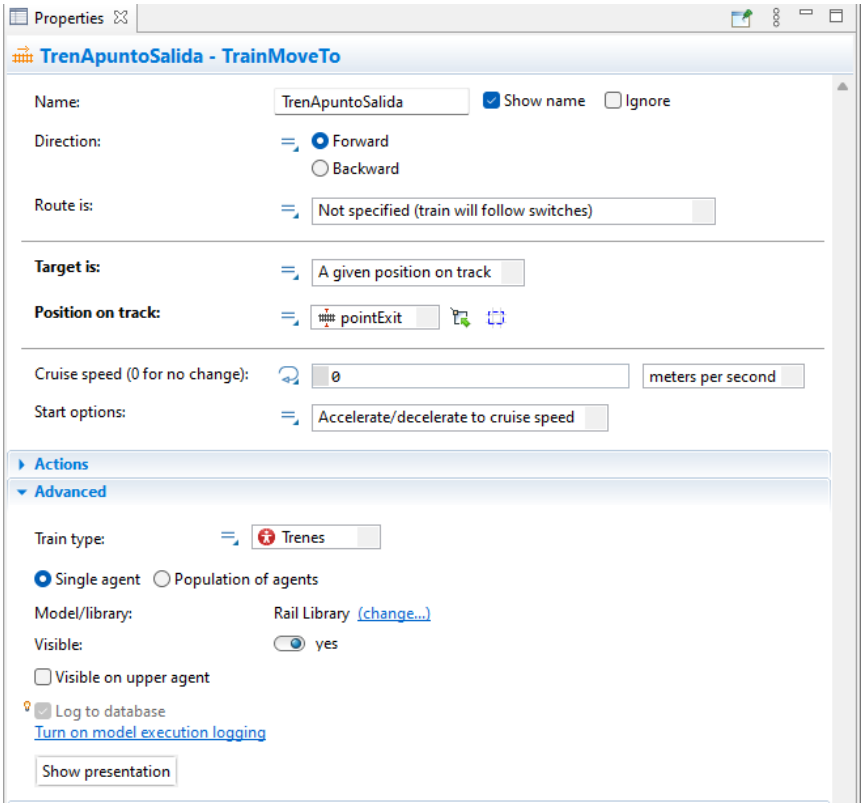

Properties
findelaDescarga - Hold
Name:
findelaDescarga
Show name
Ignore
Mode:
Manual (use block(), unblock())
Initially blocked:
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

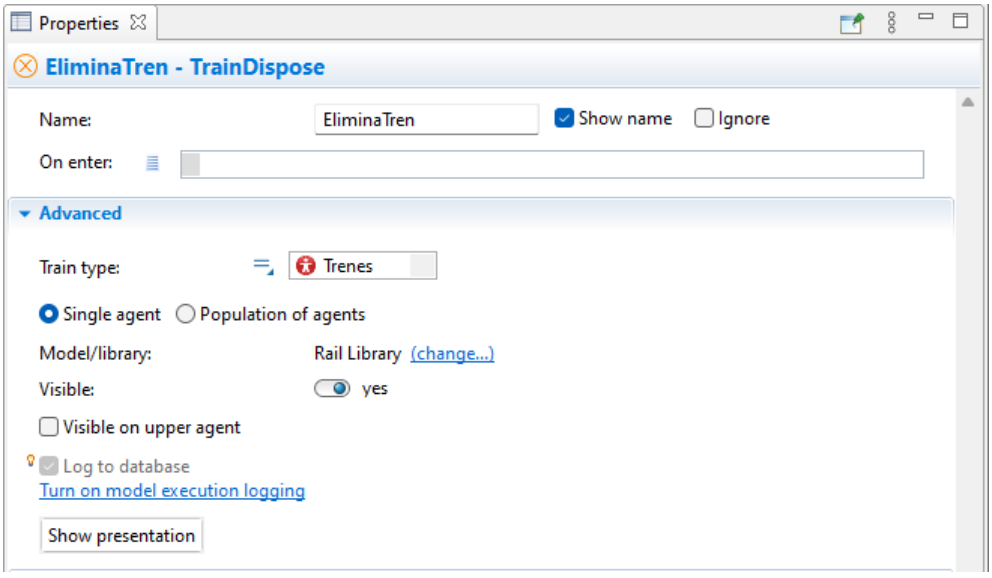

Properties
FiltrarVagonesDescargados - SelectOutput
Name:
FiltrarVagonesDescargados
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
(agent.VagonADescargar==0)
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation


Properties
delay - Delay
Name:
delay
Show name
Ignore
Type:
Specified time
Until stopDelay() is called
Delay time:
0.002
seconds
Capacity:
1
Maximum capacity:
Agent location:
Advanced
Forced pushing:
Restore agent location on exit:
Force statistics collection:
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes

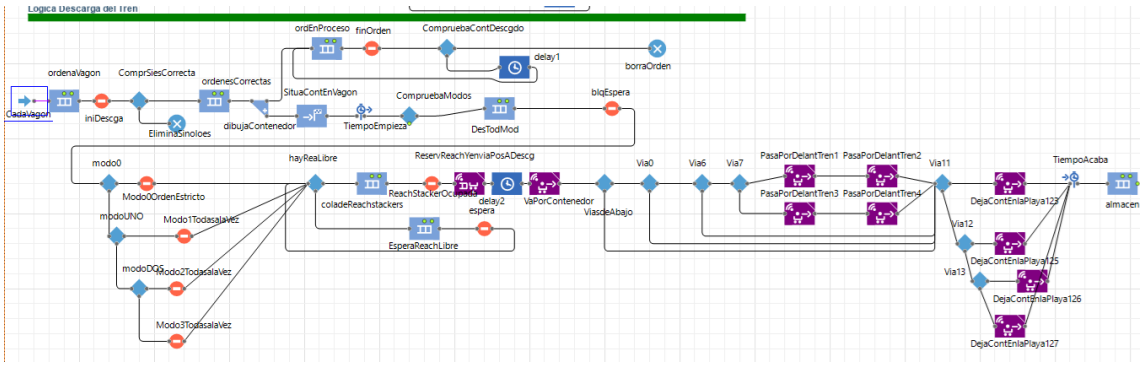

Properties
ColadeSalida - Queue
Name:
ColadeSalida
Show name
Ignore
Capacity:
ViasenTotal
Maximum capacity:
Agent location:
Advanced
Queuing:
FIFO
Enable exit on timeout:
Enable preemption:
Restore agent location on exit:
Force statistics collection:
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

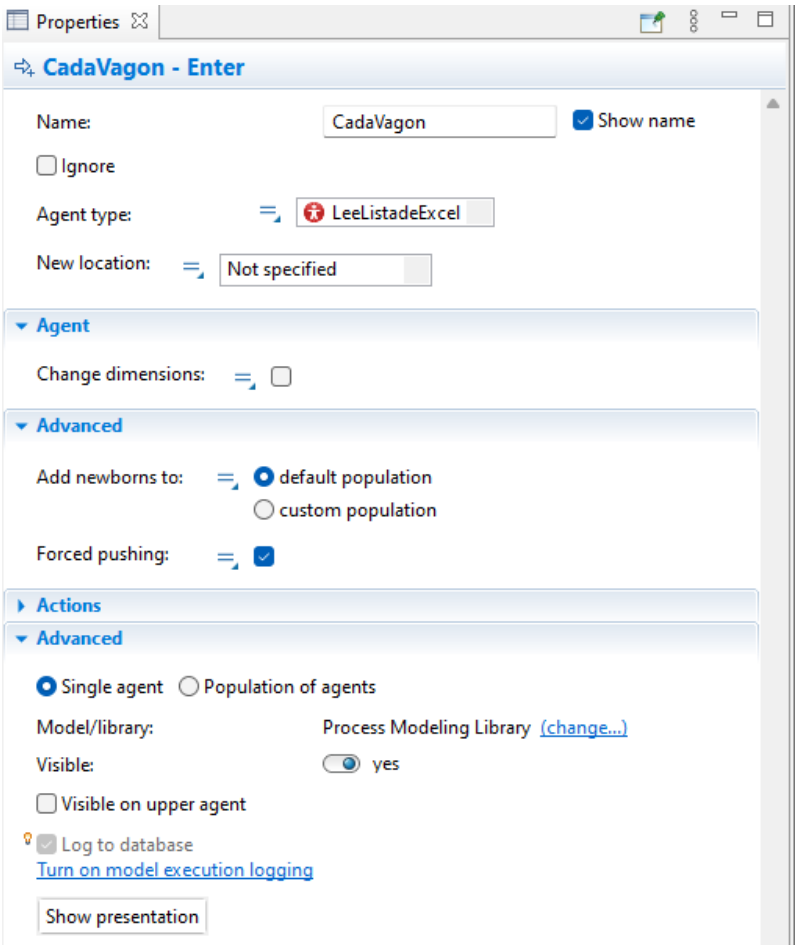

Properties
reservaSalida - RestrictedAreaStart
Name:
reservaSalida
Show name
Ignore
Capacity (max allowed):
1
Actions
Advanced
Agent type:
Trenes
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

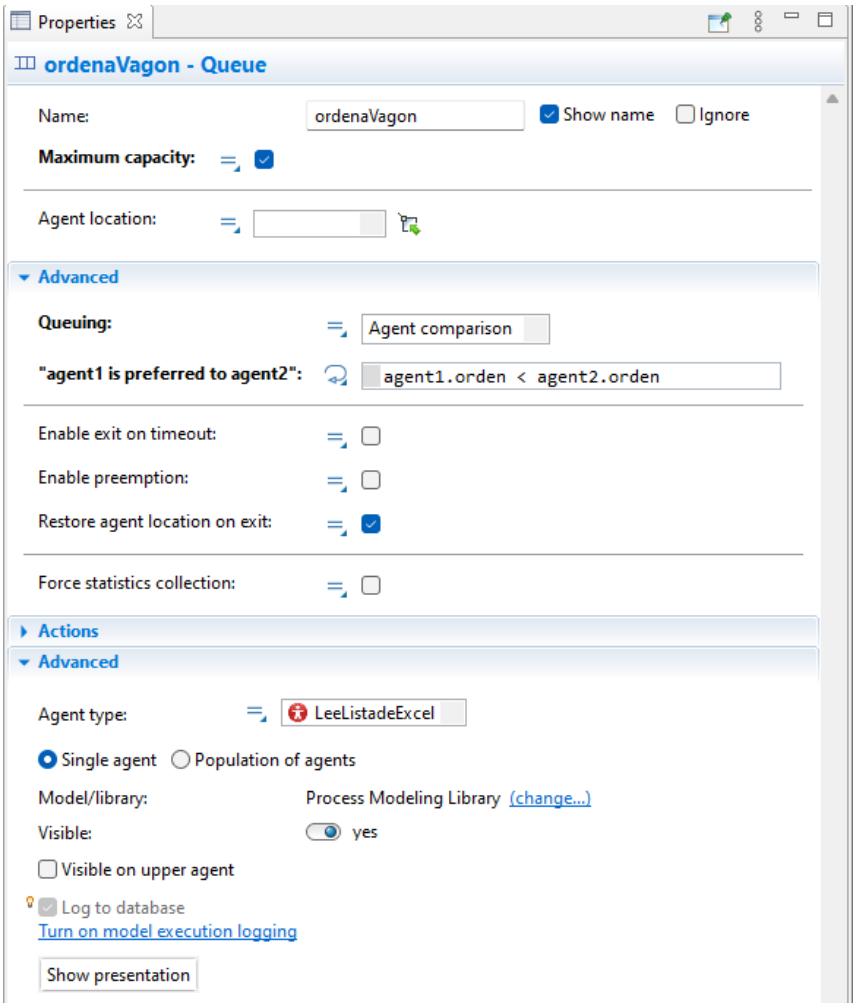

Properties
TrenApuntoSalida - TrainMoveTo
Name:
TrenApuntoSalida
Show name
Ignore
Direction:
Forward
Backward
Route is:
Not specified (train will follow switches)
Target is:
A given position on track
Position on track:
pointExit
Cruise speed (0 for no change):
0
meters per second
Start options:
Accelerate/decelerate to cruise speed
Actions
Advanced
Train type:
Trenes
Single agent
Population of agents
Model/library:
Rail Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

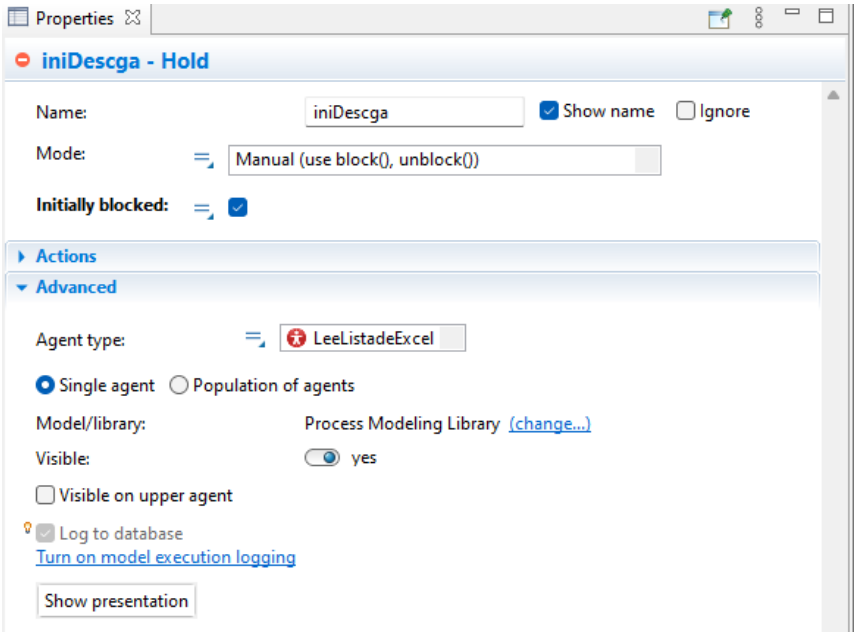

Properties
EliminaTren - TrainDispose
Name:
EliminaTren
Show name
Ignore
On enter:
Advanced
Train type:
Trenes
Single agent
Population of agents
Model/library:
Rail Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

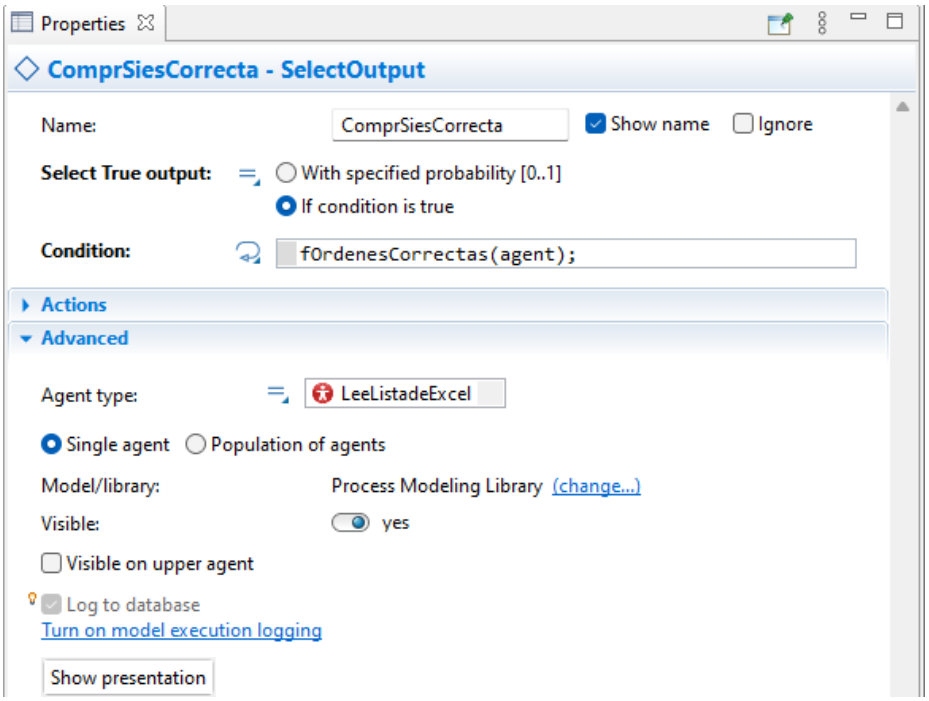
ANEXO 6: LÓGICA DE DESCARGA

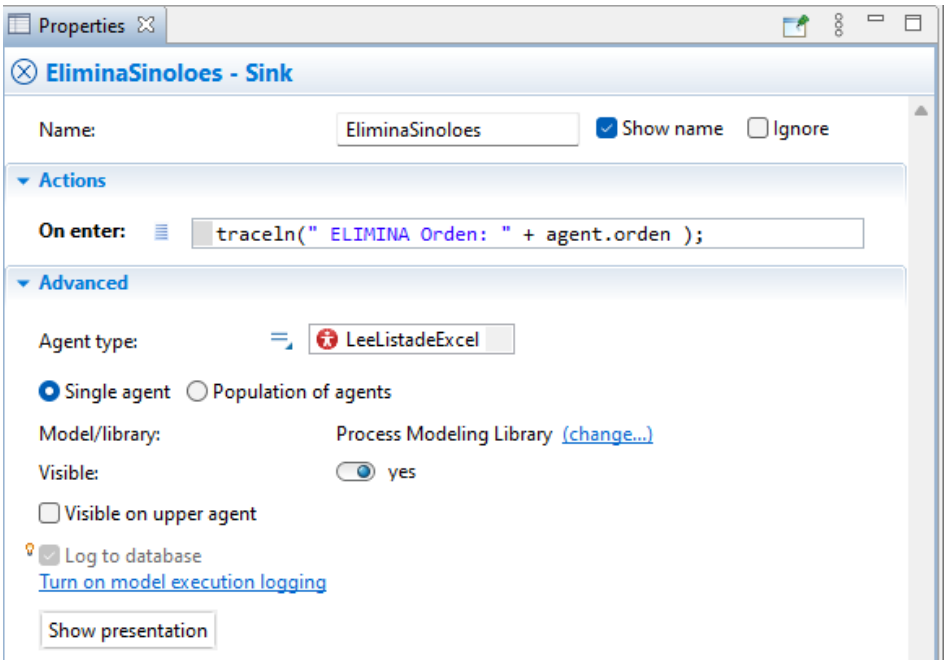


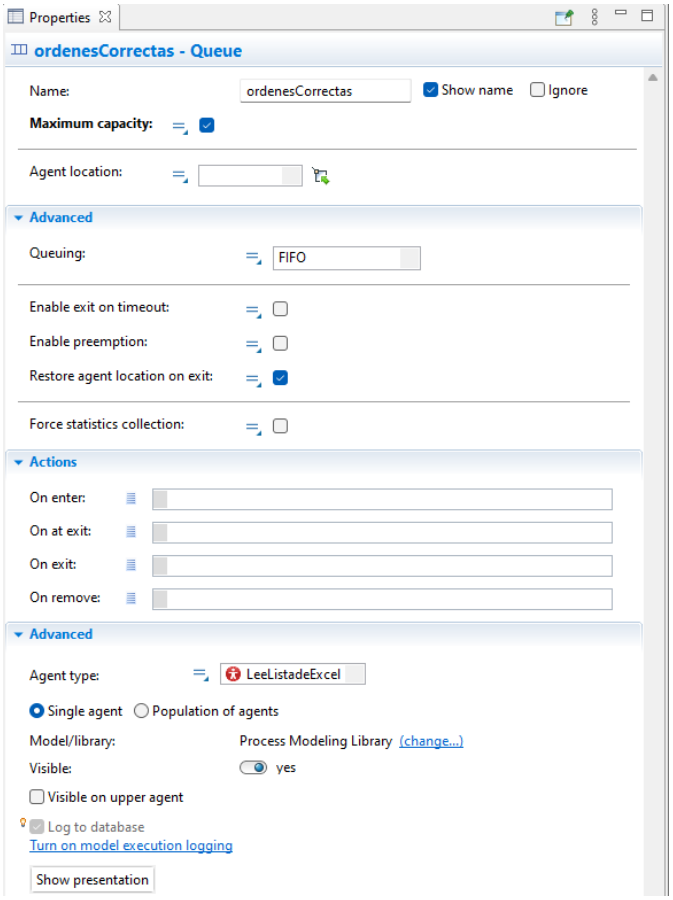


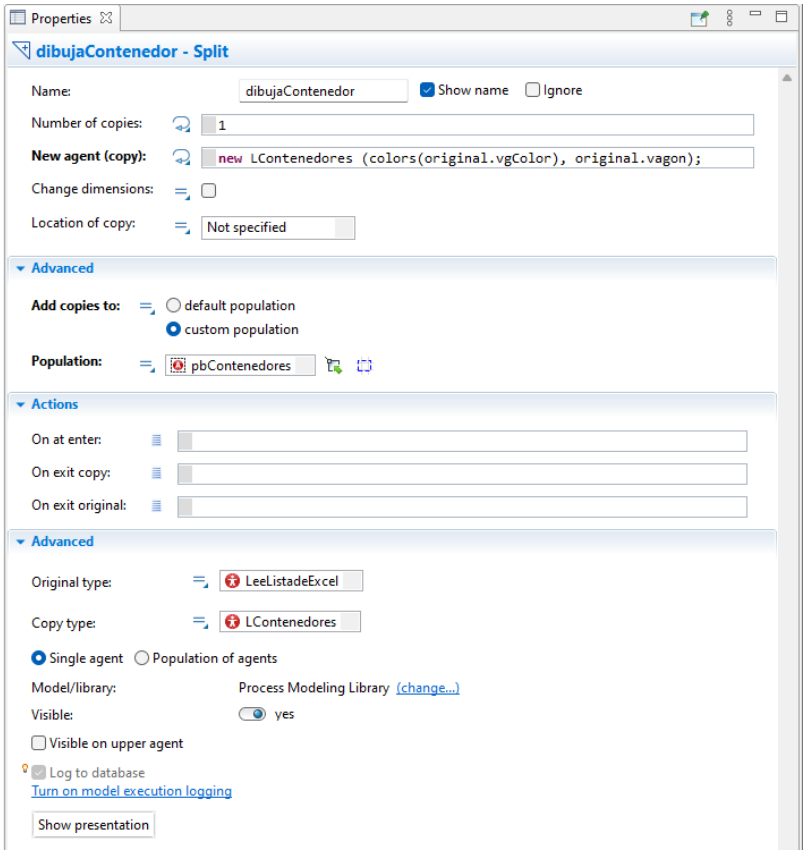

Properties
ordenaVagon - Queue
Name:
ordenaVagon
Show name
Ignore
Maximum capacity:
Agent location:
Advanced
Queuing:
Agent comparison
"agent1 is preferred to agent2":
agent1.orden < agent2.orden
Enable exit on timeout:
Enable preemption:
Restore agent location on exit:
Force statistics collection:
Actions
Advanced
Agent type:
LeeListadeExcel
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

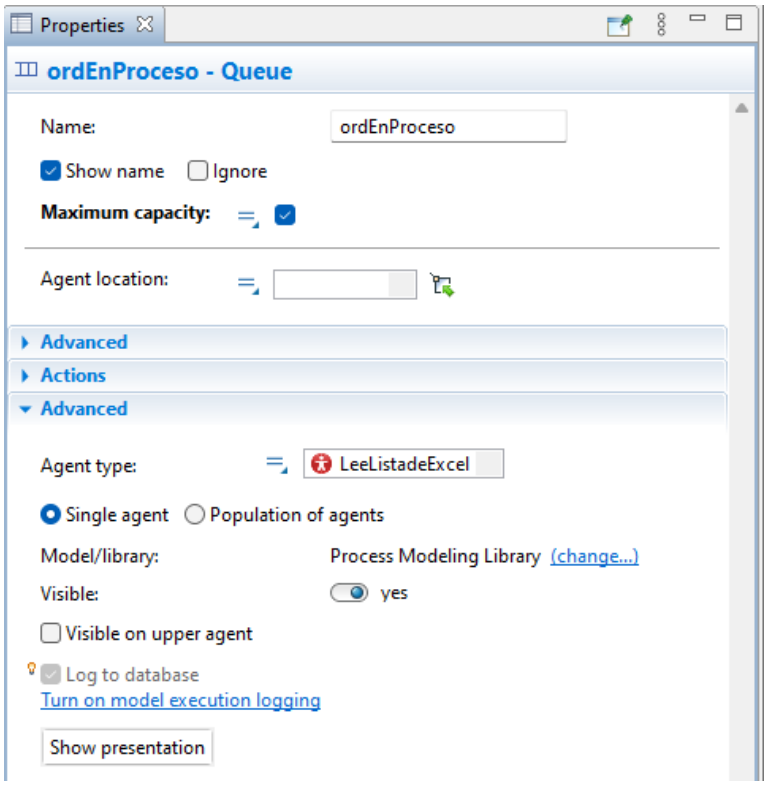

Properties
iniDescga - Hold
Name:
iniDescga
Show name
Ignore
Mode:
Manual (use block(), unblock())
Initially blocked:
Actions
Advanced
Agent type:
LeeListadeExcel
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

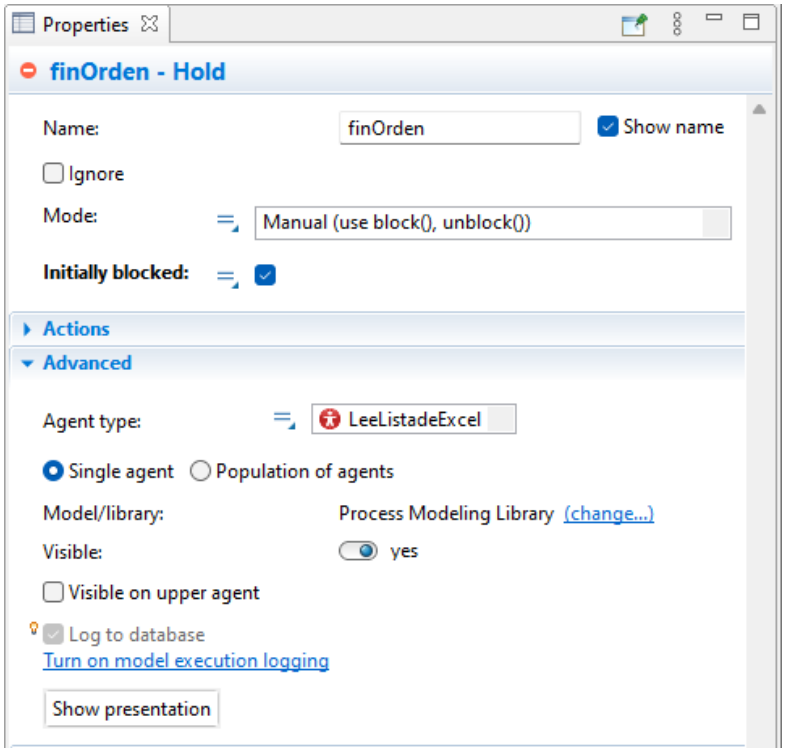

Properties
ComprSiesCorrecta - SelectOutput
Name:
ComprSiesCorrecta
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
fOrdenesCorrectas(agent);
Actions
Advanced
Agent type:
LeeListadeExcel
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

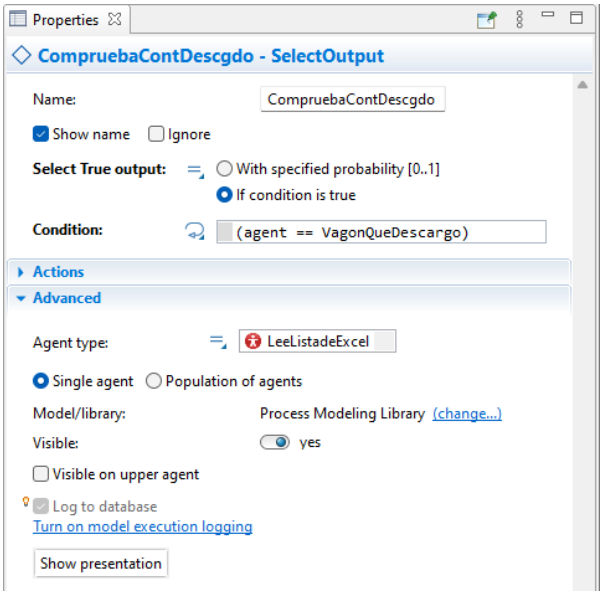

Properties
EliminaSinoloes - Sink
Name:
EliminaSinoloes
Show name
Ignore
Actions
On enter:
traceln(" ELIMINA Orden: " + agent.orden);
Advanced
Agent type:
LeeListadeExcel
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

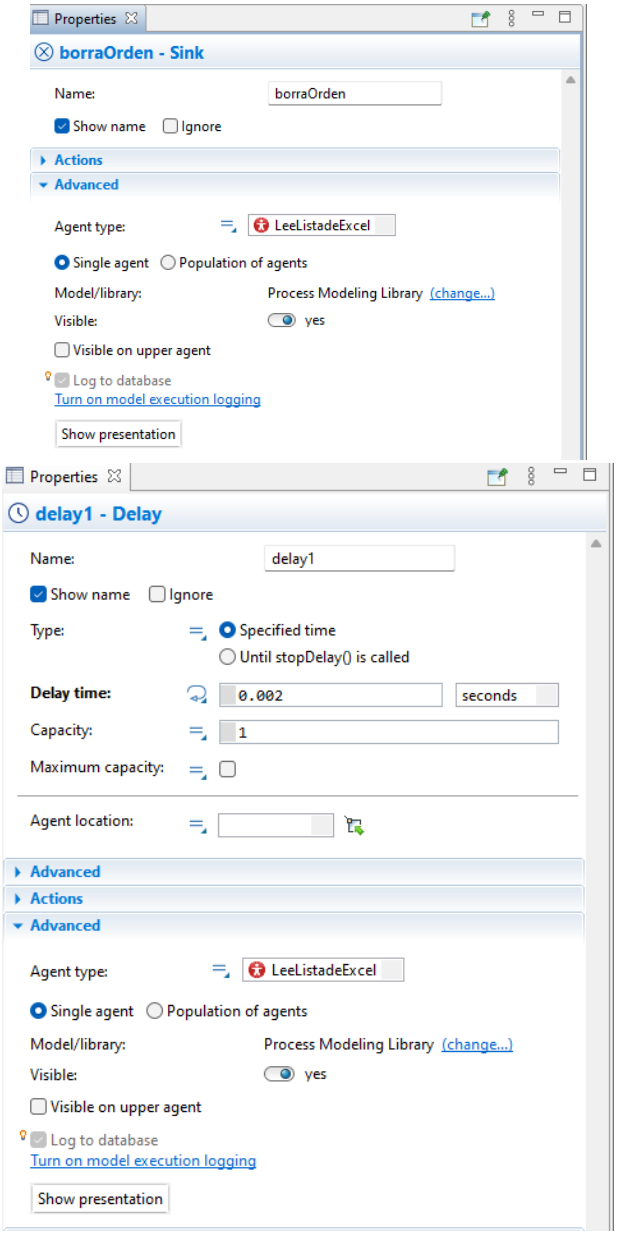

Properties
ordenesCorrectas - Queue
Name:
ordenesCorrectas
Show name
Ignore
Maximum capacity:
Agent location:
Advanced
Queuing:
FIFO
Enable exit on timeout:
Enable preemption:
Restore agent location on exit:
Force statistics collection:
Actions
On enter:
On at exit:
On exit:
On remove:
Advanced
Agent type:
LeeListadeExcel
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

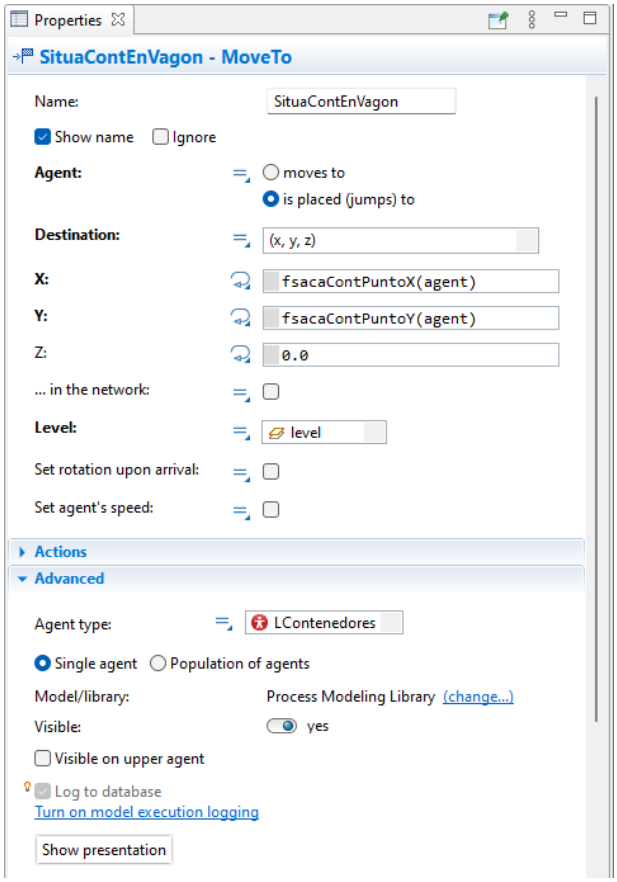

Properties
dibujaContenedor - Split
Name:
dibujaContenedor
Show name
Ignore
Number of copies:
1
New agent (copy):
new LContenedores (colors(original.vgColor), original.vagon);
Change dimensions:
Location of copy:
Not specified
Advanced
Add copies to:
default population
custom population
Population:
pbContenedores
Actions
On at enter:
On exit copy:
On exit original:
Advanced
Original type:
LeeListadeExcel
Copy type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

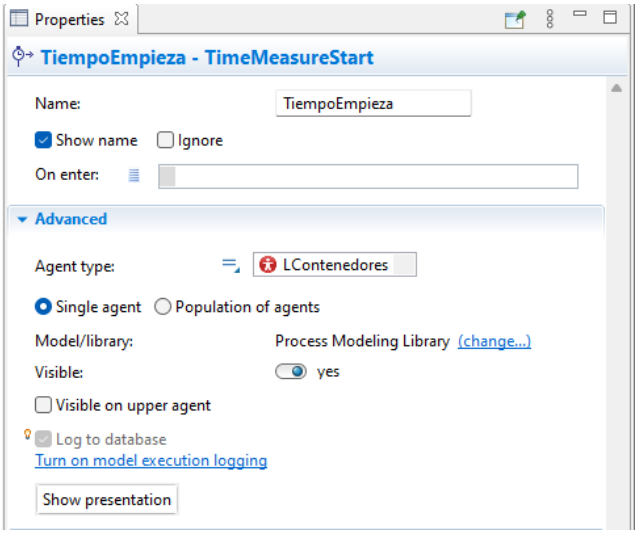

Properties
ordEnProceso - Queue
Name:
ordEnProceso
Show name
Ignore
Maximum capacity:
Agent location:
Advanced
Actions
Advanced
Agent type:
LeeListadeExcel
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

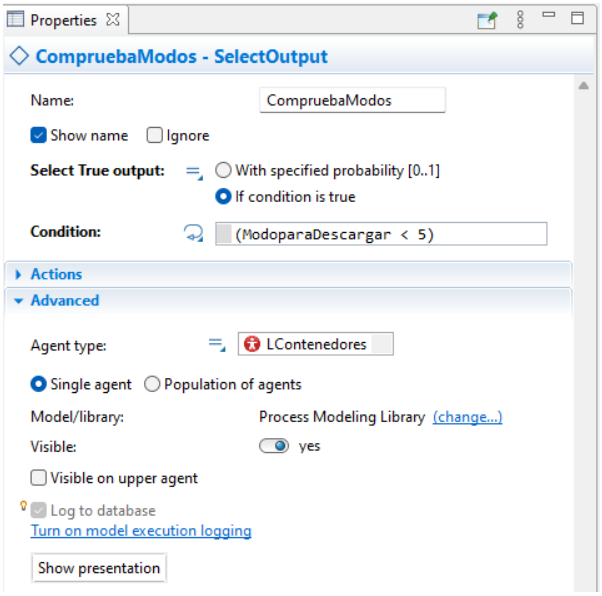

Properties
finOrden - Hold
Name:
finOrden
Show name
Ignore
Mode:
Manual (use block(), unblock())
Initially blocked:
Actions
Advanced
Agent type:
LeeListadeExcel
Single agent
Population of agents
Model/library:
Process Modeling Library (change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

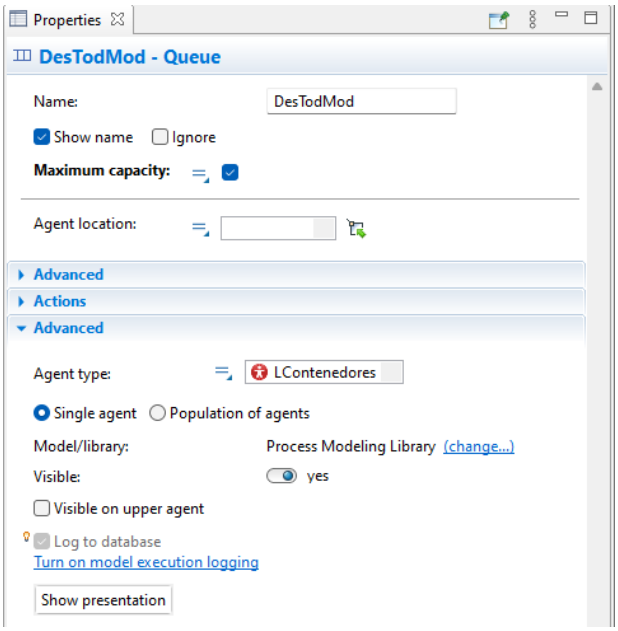

Properties
CompruebaContDescgdo - SelectOutput
Name:
CompruebaContDescgdo
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
(agent == VagonQueDescargo)
Actions
Advanced
Agent type:
LeeListadeExcel
Single agent
Population of agents
Model/library:
Process Modeling Library (change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

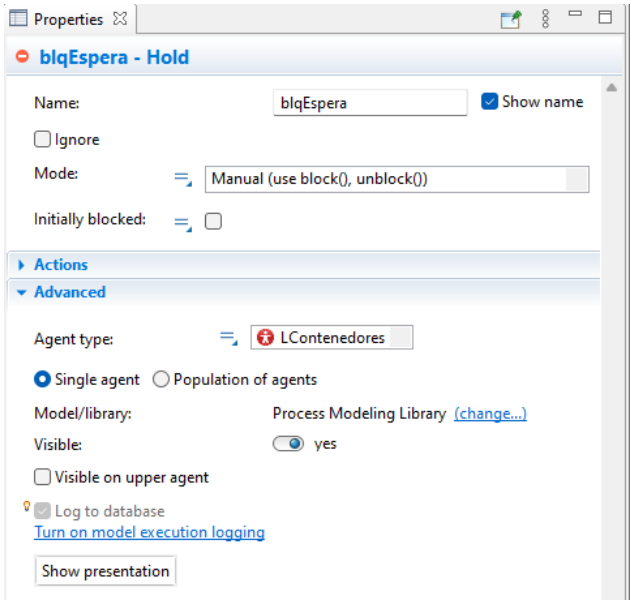

Properties
borraOrden - Sink
Name: borraOrden
Show name
Ignore
Actions
Advanced
Agent type: LeeListadeExcel
Single agent
Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation
Properties
delay1 - Delay
Name: delay1
Show name
Ignore
Type: Specified time
Until stopDelay() is called
Delay time: 0.002 seconds
Capacity: 1
Maximum capacity:
Agent location:
Advanced
Actions
Advanced
Agent type: LeeListadeExcel
Single agent
Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

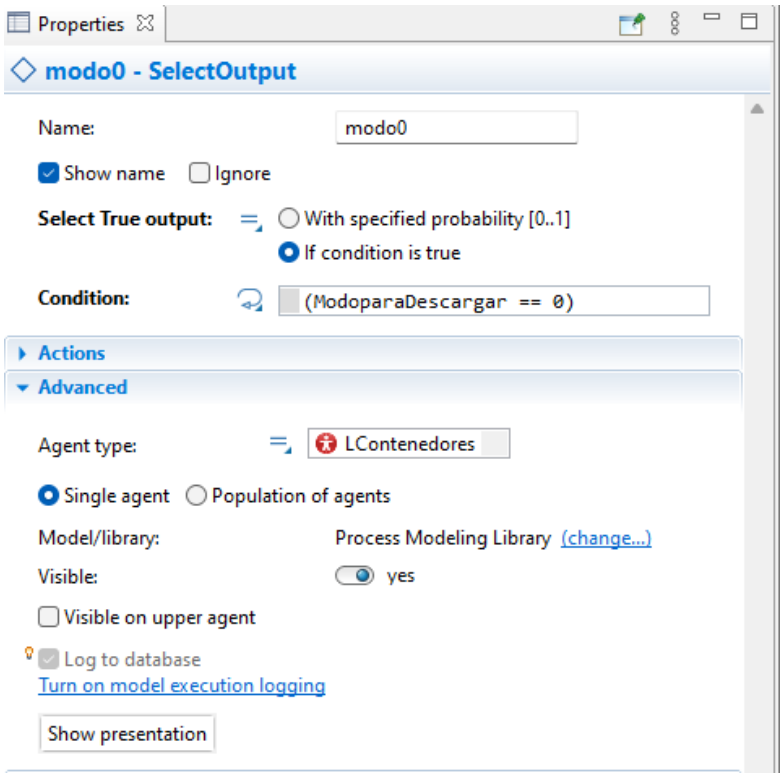

Properties
SituaContEnVagon - MoveTo
Name: SituaContEnVagon
Show name
Ignore
Agent:
moves to
is placed (jumps) to
Destination: (x, y, z)
X: fsacaContPuntoX(agent)
Y: fsacaContPuntoY(agent)
Z: 0.0
... in the network:
Level: level
Set rotation upon arrival:
Set agent's speed:
Actions
Advanced
Agent type: LContenedores
Single agent
Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

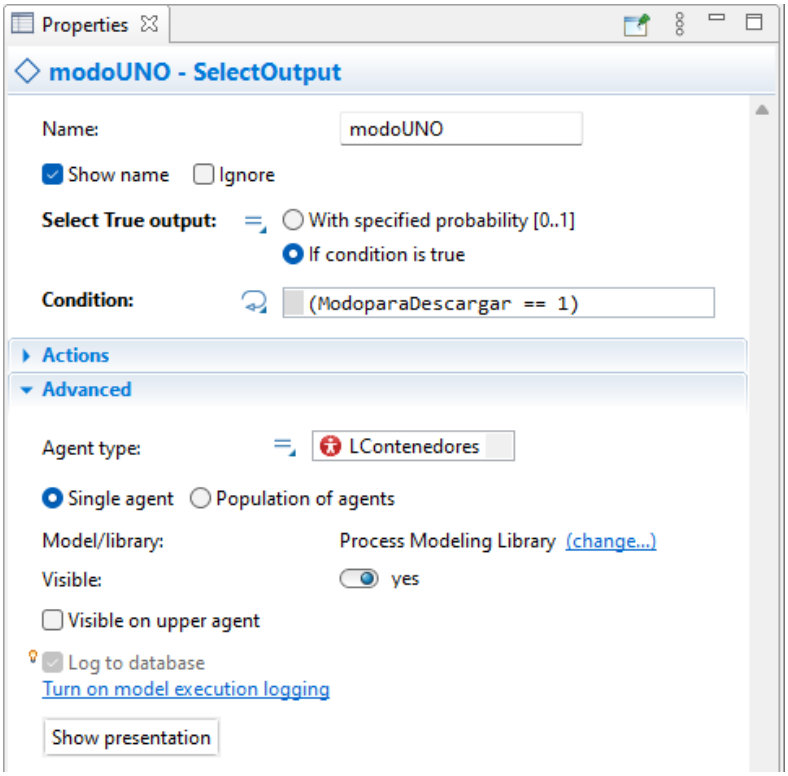

Properties
TiempoEmpieza - TimeMeasureStart
Name: TiempoEmpieza
Show name
Ignore
On enter:
Advanced
Agent type: LContenedores
Single agent
Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

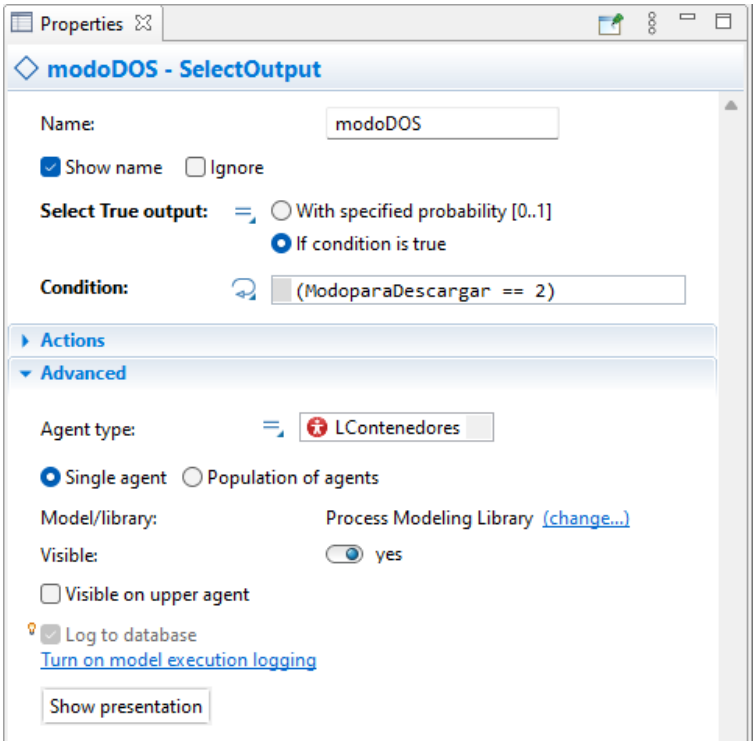

Properties
CompruebaModos - SelectOutput
Name:
CompruebaModos
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
(ModoparaDescargar < 5)
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

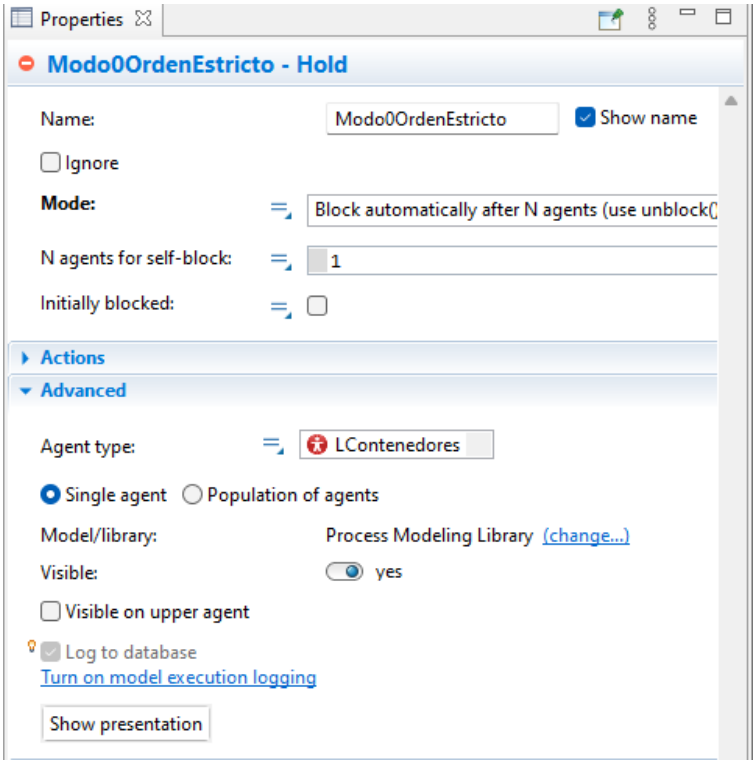

Properties
DesTodMod - Queue
Name:
DesTodMod
Show name
Ignore
Maximum capacity:
Agent location:
Advanced
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

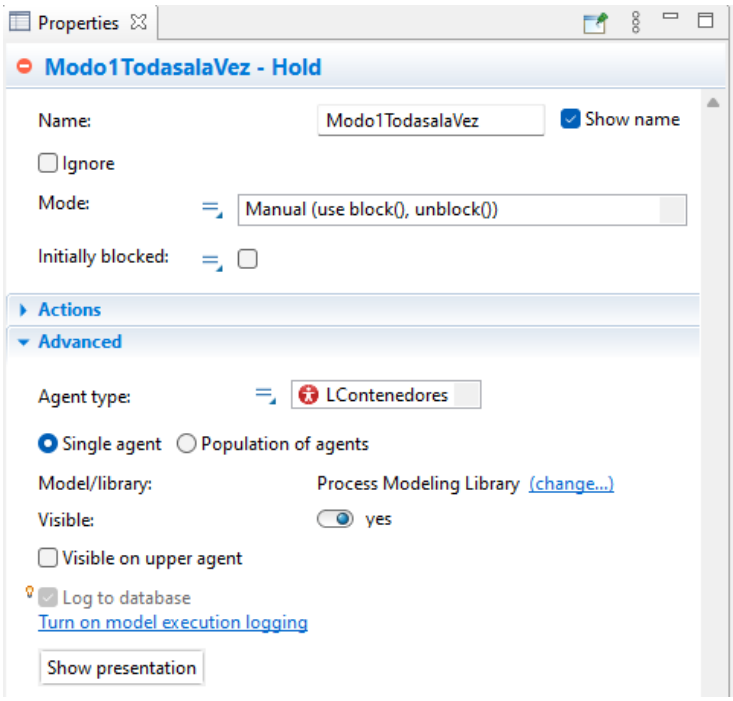

Properties
blqEspera - Hold
Name:
blqEspera
Show name
Ignore
Mode:
Manual (use block(), unblock())
Initially blocked:
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

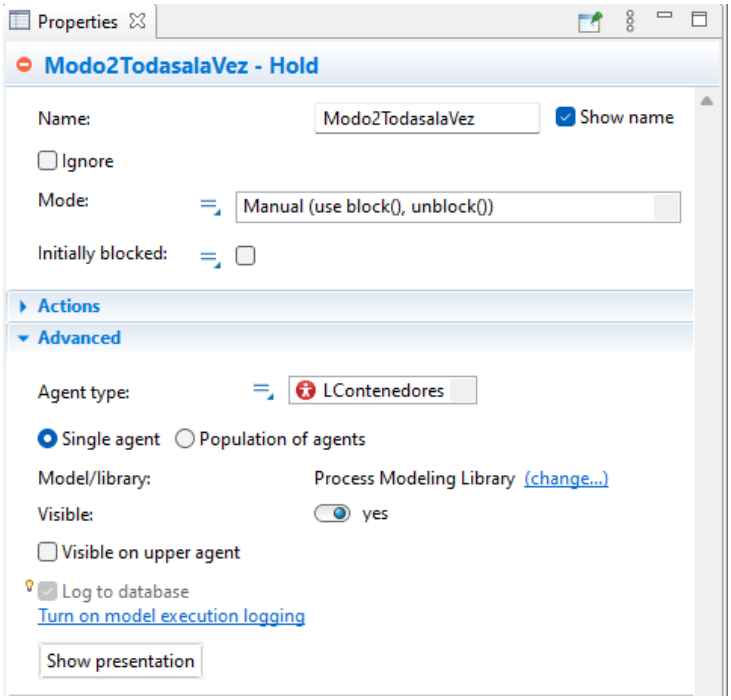

Properties
modo0 - SelectOutput
Name:
modo0
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
(ModoparaDescargar == 0)
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

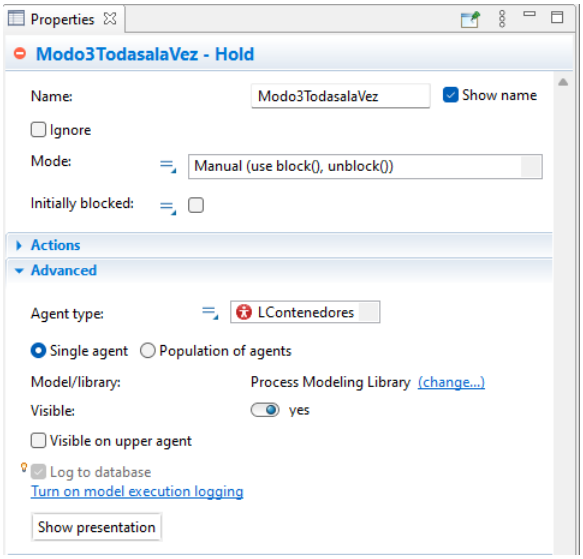

Properties
modoUNO - SelectOutput
Name:
modoUNO
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
(ModoparaDescargar == 1)
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

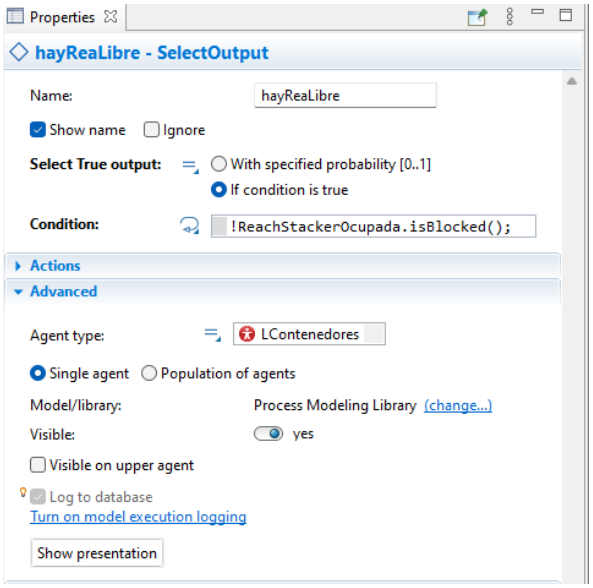

Properties
modoDOS - SelectOutput
Name:
modoDOS
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
(ModoparaDescargar == 2)
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

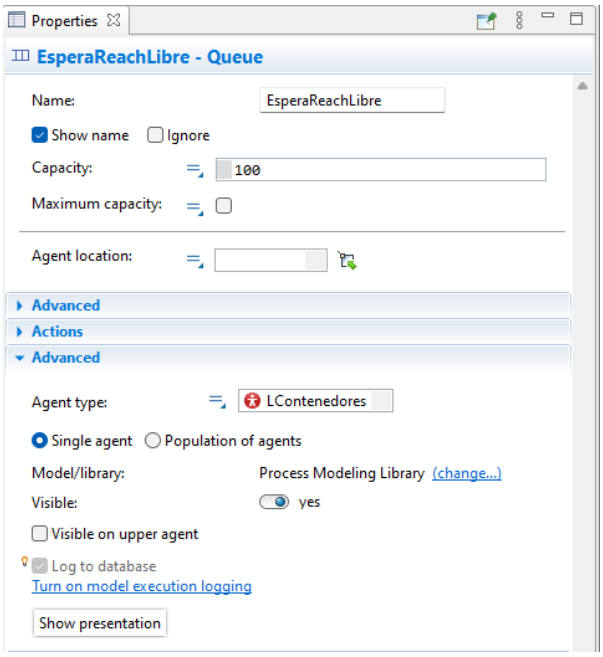

Properties
Modo0OrdenEstricto - Hold
Name:
Modo0OrdenEstricto
Show name
Ignore
Mode:
Block automatically after N agents (use unblock()
N agents for self-block:
1
Initially blocked:
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library (change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

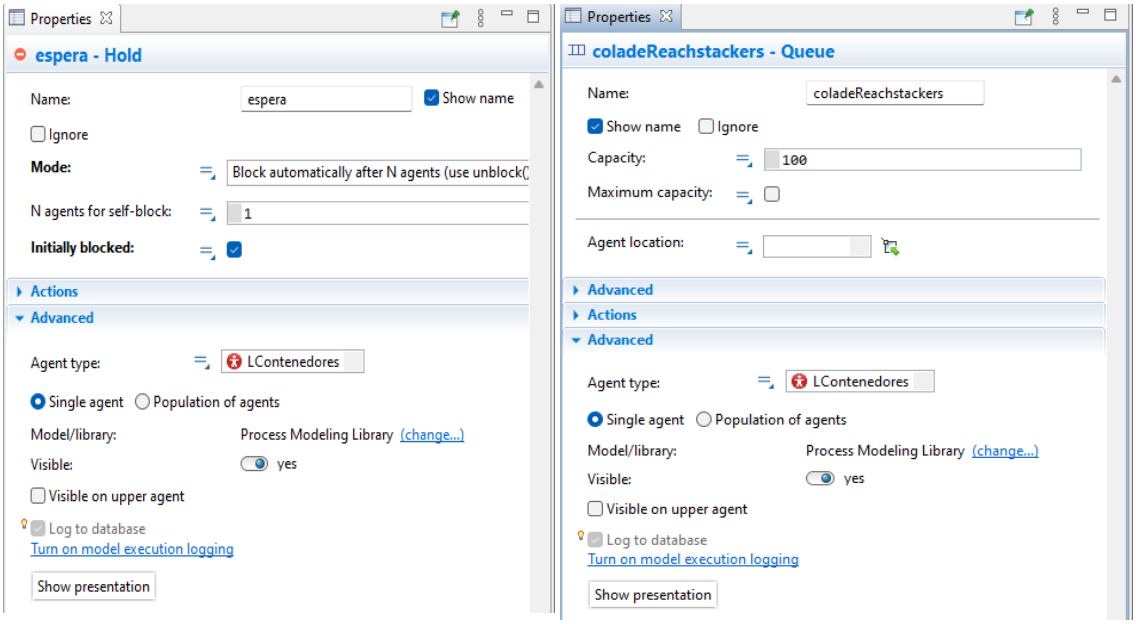

Properties
Modo1TodasalaVez - Hold
Name:
Modo1TodasalaVez
Show name
Ignore
Mode:
Manual (use block(), unblock())
Initially blocked:
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library (change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

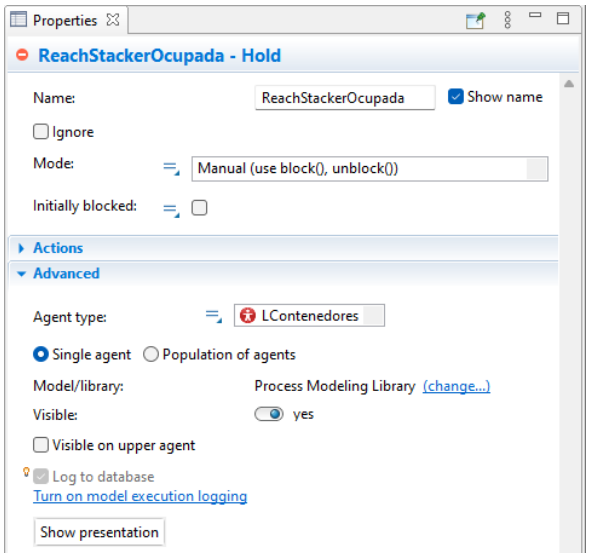

Properties
Modo2TodasalaVez - Hold
Name:
Modo2TodasalaVez
Show name
Ignore
Mode:
Manual (use block(), unblock())
Initially blocked:
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

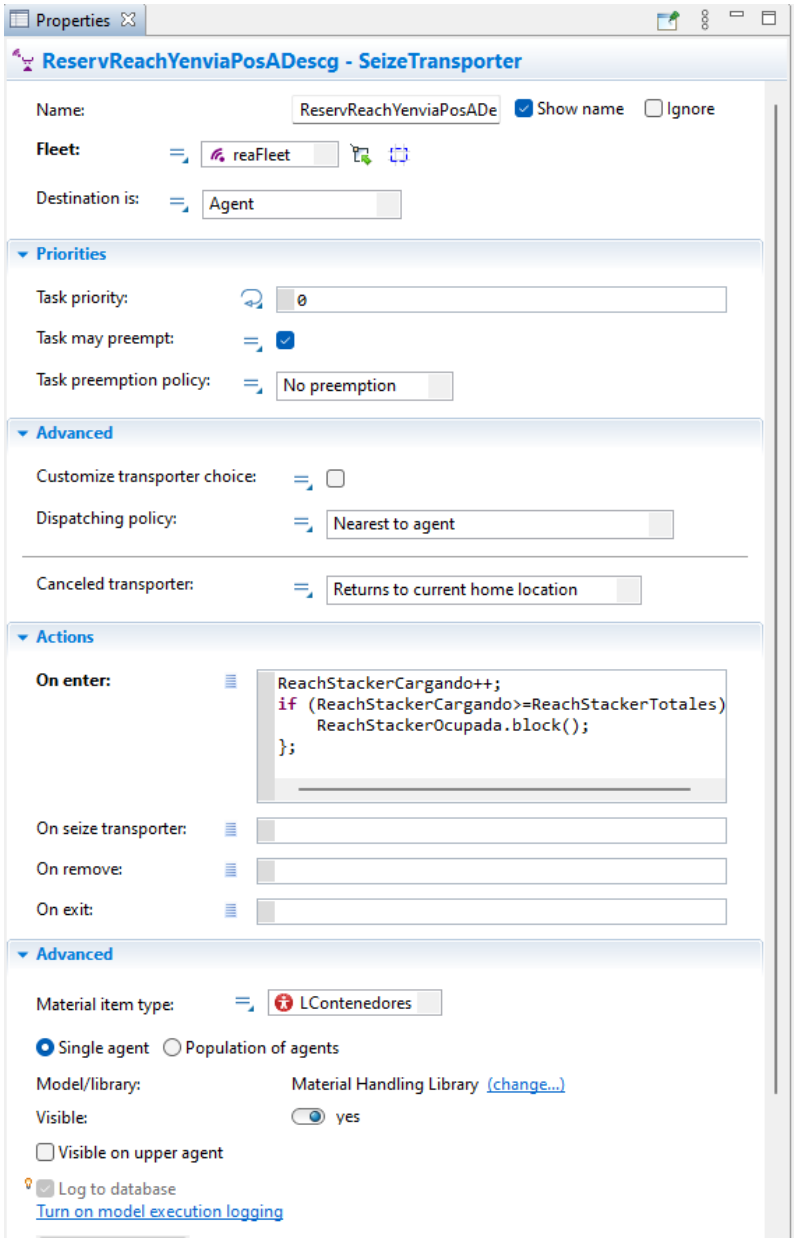

Properties
Modo3TodasalaVez - Hold
Name:
Modo3TodasalaVez
Show name
Ignore
Mode:
Manual (use block(), unblock())
Initially blocked:
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

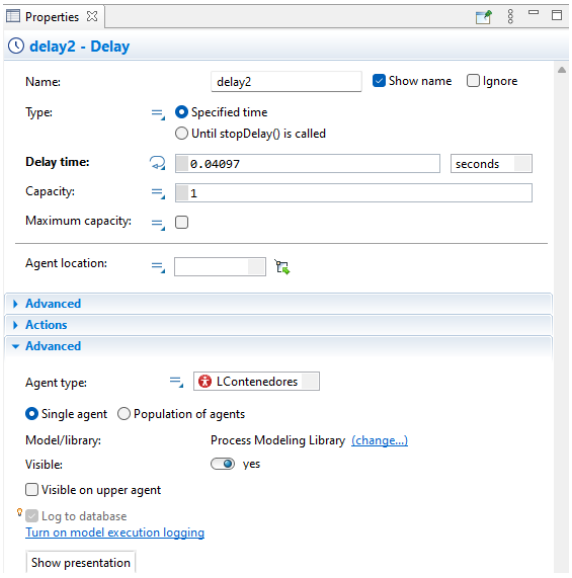

Properties
hayReaLibre - SelectOutput
Name:
hayReaLibre
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
!ReachStackerOcupada.isBlocked();
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

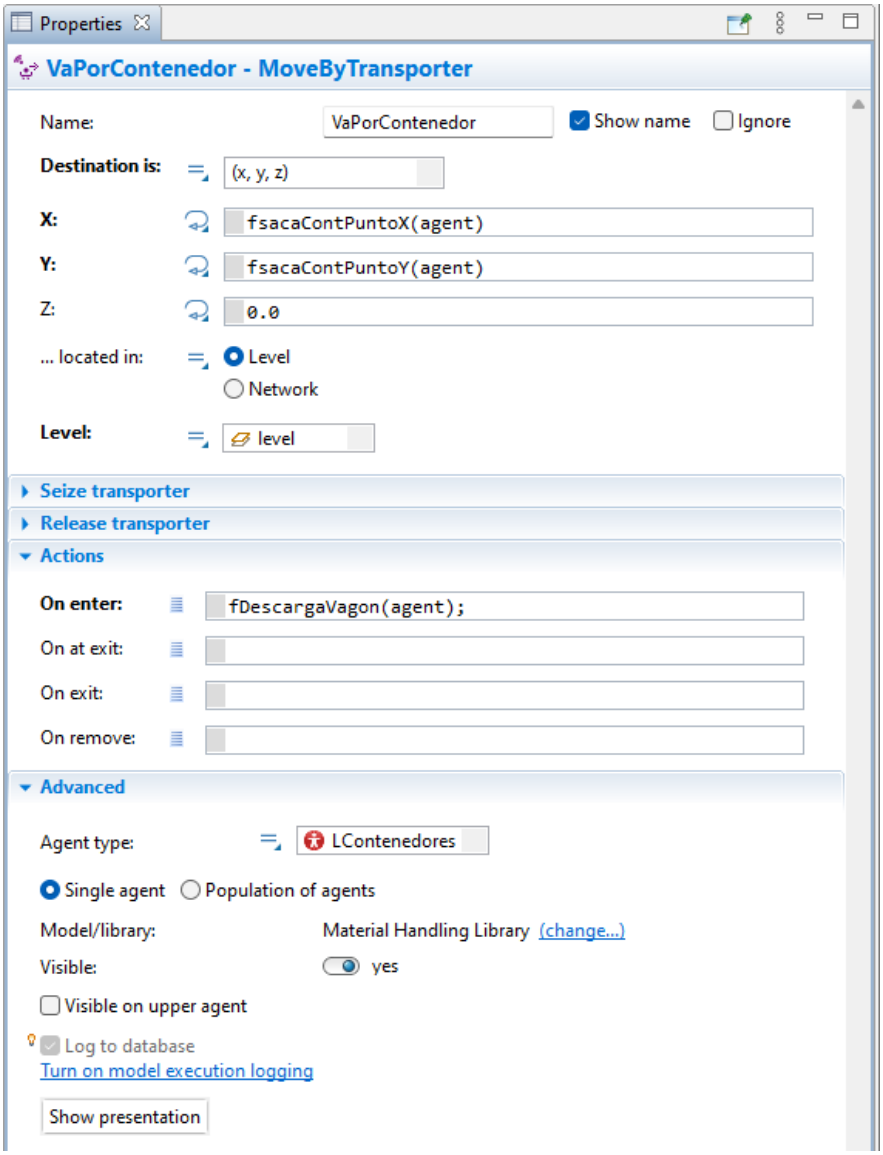

Properties
EsperaReachLibre - Queue
Name:
EsperaReachLibre
Show name
Ignore
Capacity:
100
Maximum capacity:
Agent location:
Advanced
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

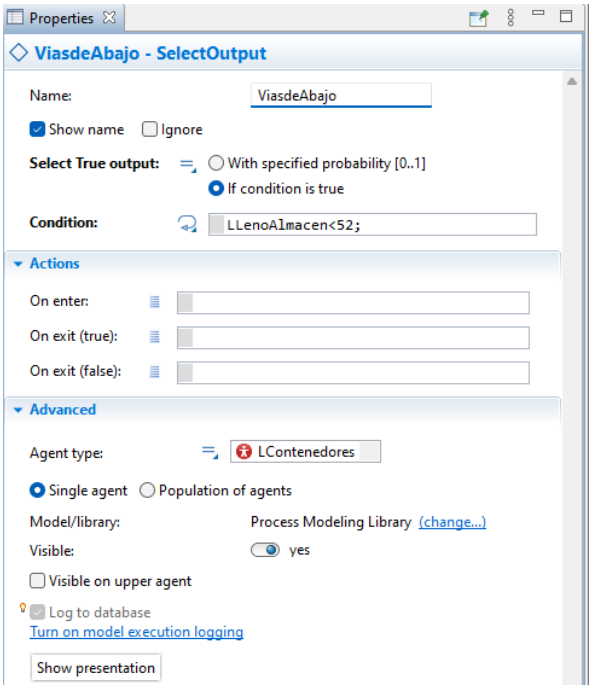

Properties
espera - Hold
Name: espera
Show name
Ignore
Mode: Block automatically after N agents (use unblock()
N agents for self-block: 1
Initially blocked:
Actions
Advanced
Agent type: LContenedores
Single agent
Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation
Properties
coladeReachstackers - Queue
Name: coladeReachstackers
Show name
Ignore
Capacity: 100
Maximum capacity:
Agent location:
Advanced
Actions
Advanced
Agent type: LContenedores
Single agent
Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

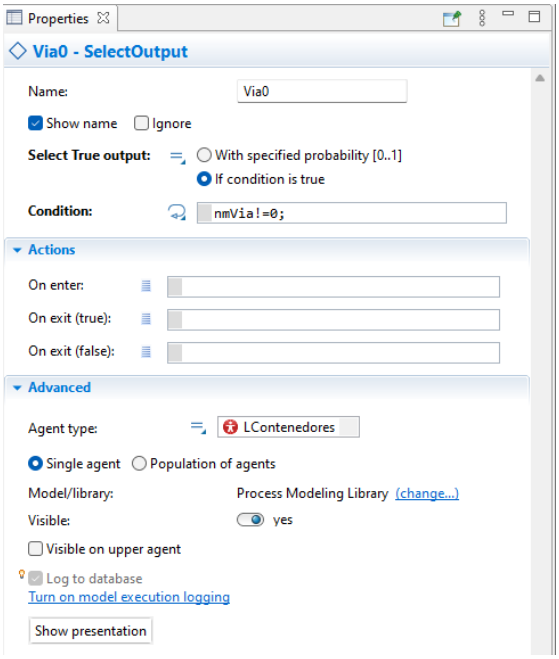

Properties
ReachStackerOcupada - Hold
Name: ReachStackerOcupada
Show name
Ignore
Mode: Manual (use block(), unblock())
Initially blocked:
Actions
Advanced
Agent type: LContenedores
Single agent
Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

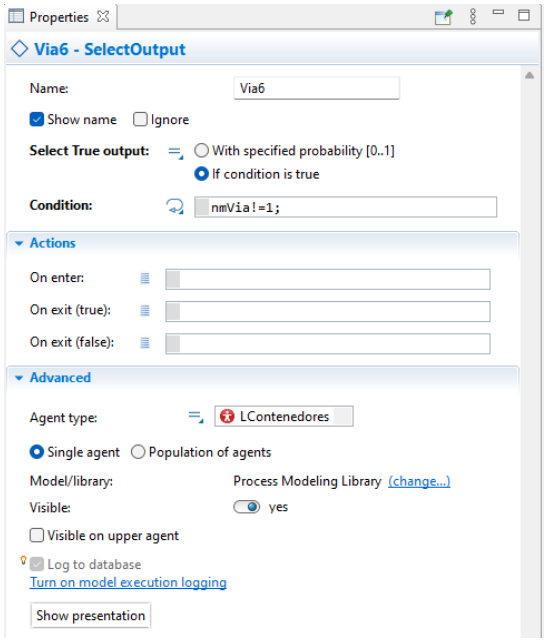

Properties
ReservReachYenviaPosADescg - SeizeTransporter
Name:
ReservReachYenviaPosADe
Show name
Ignore
Fleet:
reaFleet
Destination is:
Agent
Priorities
Task priority:
0
Task may preempt:
Task preemption policy:
No preemption
Advanced
Customize transporter choice:
Dispatching policy:
Nearest to agent
Canceled transporter:
Returns to current home location
Actions
On enter:
ReachStackerCargando++;
if (ReachStackerCargando>=ReachStackerTotales)
ReachStackerOcupada.block();
};
On seize transporter:
On remove:
On exit:
Advanced
Material item type:
LContenedores
Single agent
Population of agents
Model/library:
Material Handling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging

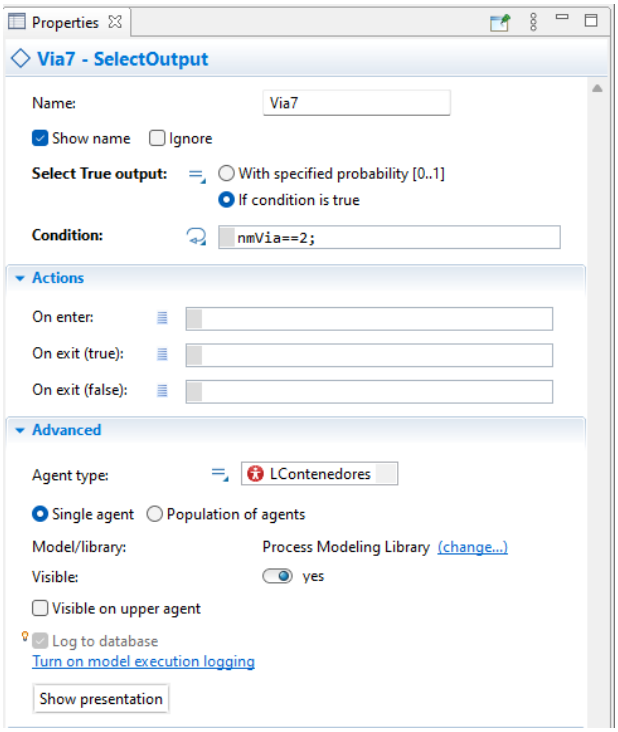

Properties
delay2 - Delay
Name: delay2
Show name
Ignore
Type:
Specified time
Until stopDelay() is called
Delay time: 0.04097 seconds
Capacity: 1
Maximum capacity:
Agent location:
Advanced
Actions
Advanced
Agent type: LContenedores
Single agent
Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

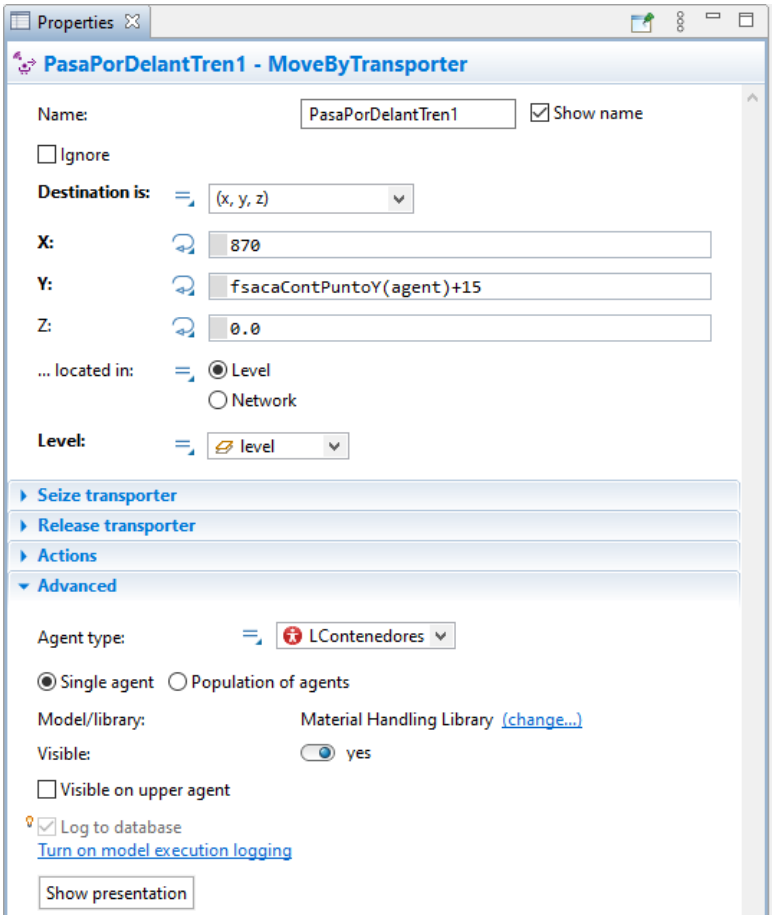

Properties
VaPorContenedor - MoveByTransporter
Name: VaPorContenedor
Show name
Ignore
Destination is: (x, y, z)
X: fsacaContPuntoX(agent)
Y: fsacaContPuntoY(agent)
Z: 0.0
... located in:
Level
Network
Level: level
Seize transporter
Release transporter
Actions
On enter: fDescargaVagon(agent);
On at exit:
On exit:
On remove:
Advanced
Agent type: LContenedores
Single agent
Population of agents
Model/library: Material Handling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

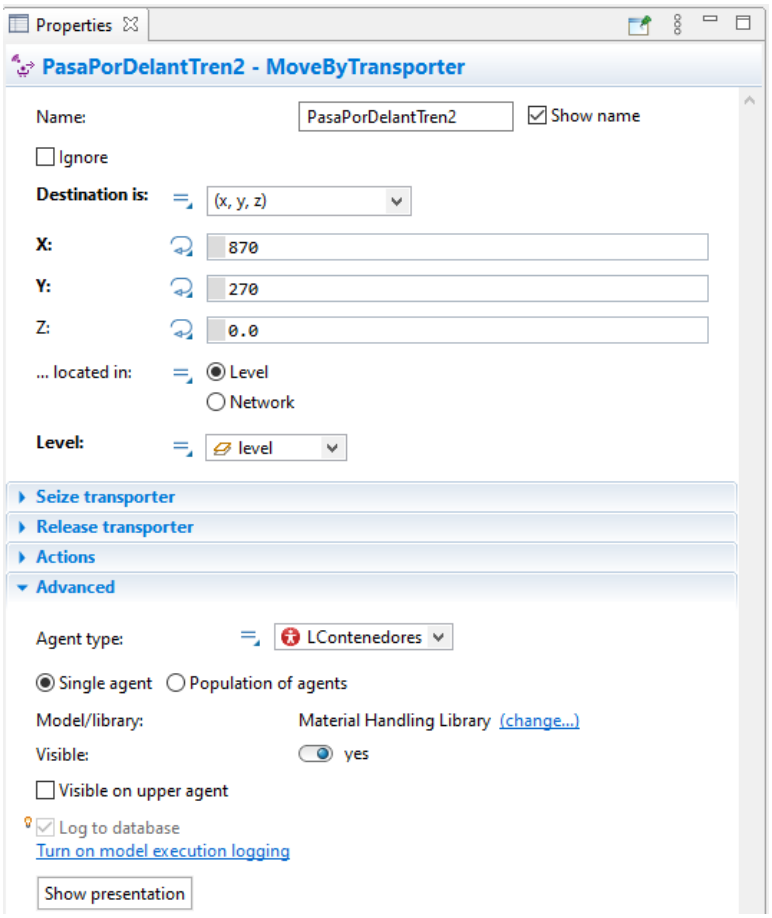

Properties
ViasdeAbajo - SelectOutput
Name: ViasdeAbajo
Show name Ignore
Select True output: With specified probability [0..1]
If condition is true
Condition: LLenoAlmacen<52;
Actions
On enter:
On exit (true):
On exit (false):
Advanced
Agent type: LContenedores
Single agent Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

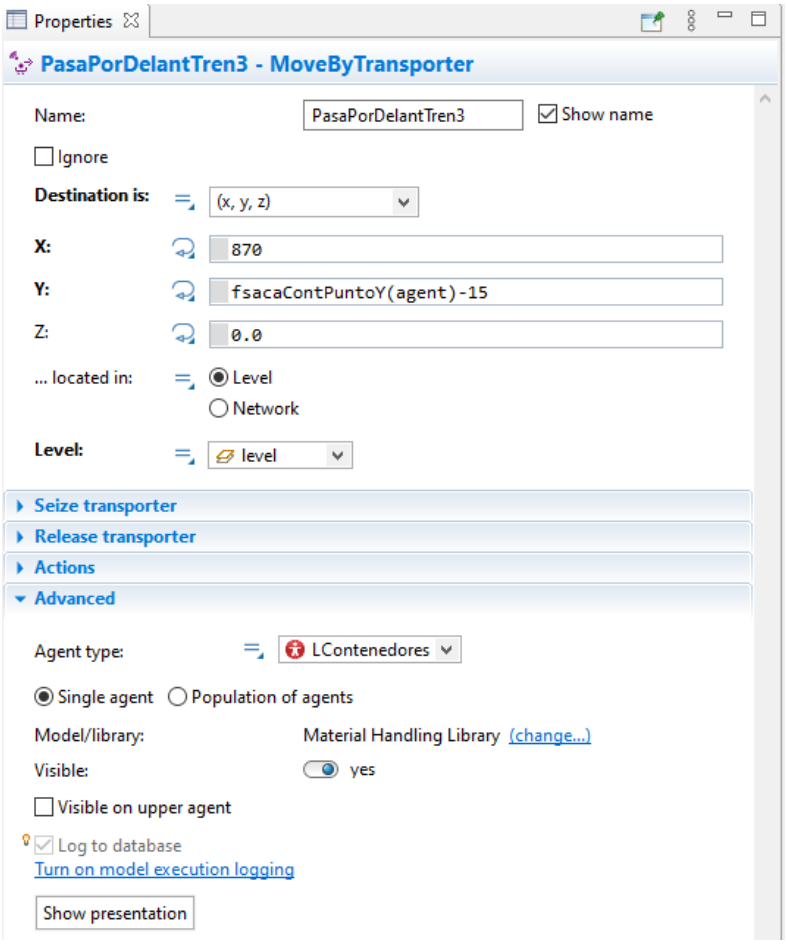

Properties
Via0 - SelectOutput
Name: Via0
Show name Ignore
Select True output: With specified probability [0..1]
If condition is true
Condition: nmVia!=0;
Actions
On enter:
On exit (true):
On exit (false):
Advanced
Agent type: LContenedores
Single agent Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

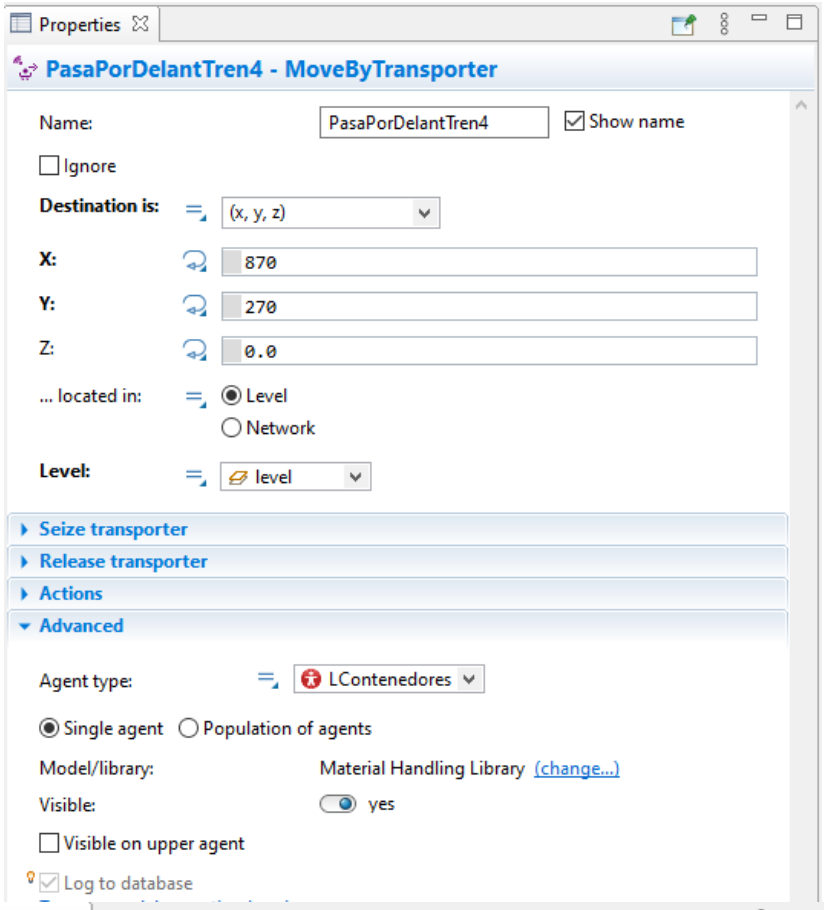

Properties
Via6 - SelectOutput
Name: Via6
Show name Ignore
Select True output: With specified probability [0..1]
If condition is true
Condition: nmVia!=1;
Actions
On enter:
On exit (true):
On exit (false):
Advanced
Agent type: LContenedores
Single agent Population of agents
Model/library: Process Modeling Library (change...)
Visible: yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

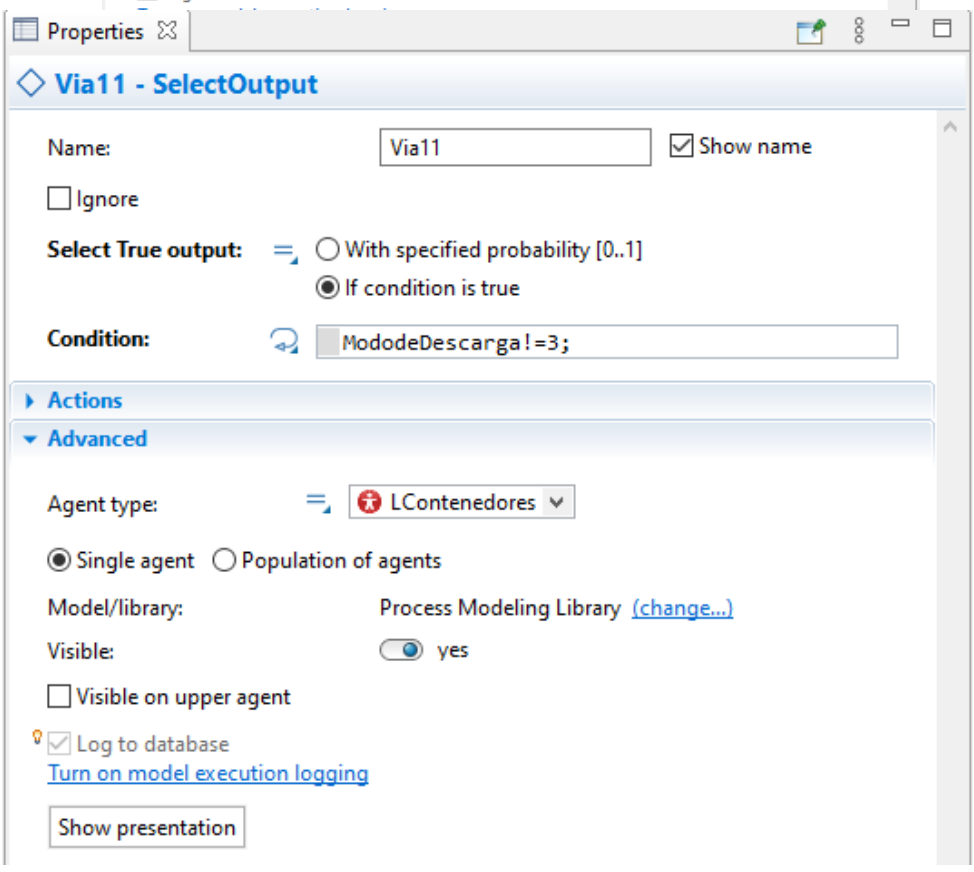

Properties
Via7 - SelectOutput
Name:
Via7
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
nmVia==2;
Actions
On enter:
On exit (true):
On exit (false):
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

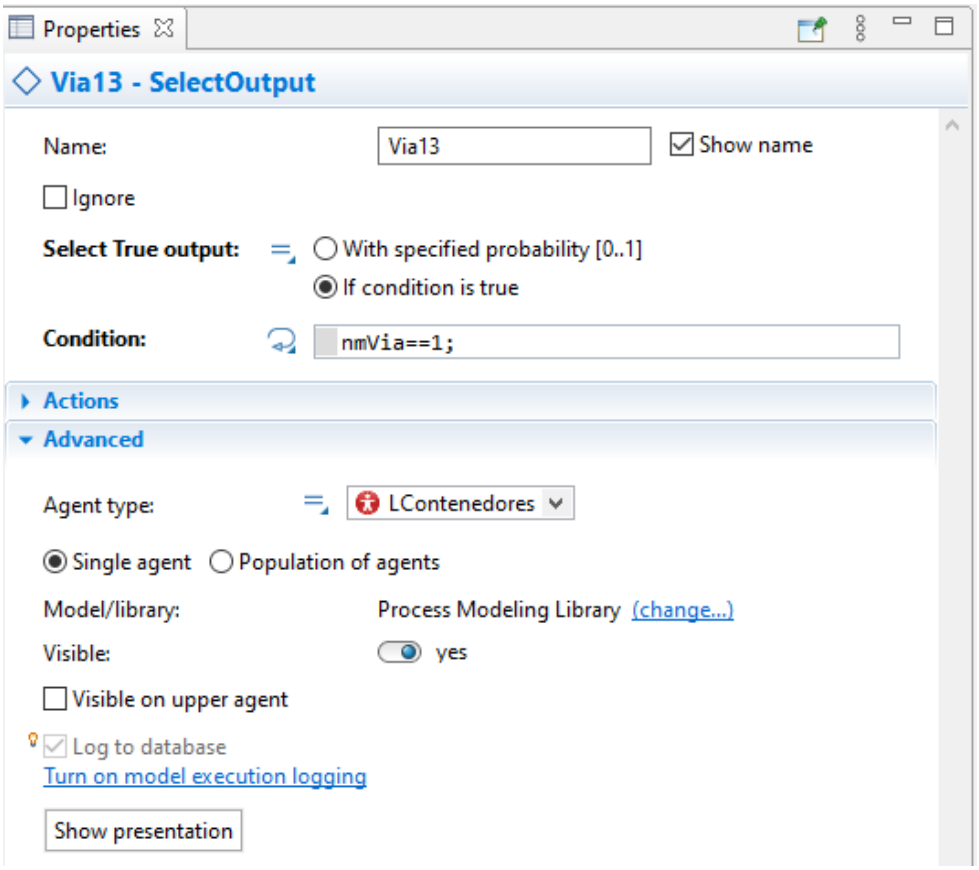

Properties
PasaPorDelantTren1 - MoveByTransporter
Name:
PasaPorDelantTren1
Show name
Ignore
Destination is:
(x, y, z)
X:
870
Y:
fsacaContPuntoY(agent)+15
Z:
0.0
... located in:
Level
Network
Level:
level
Seize transporter
Release transporter
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Material Handling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

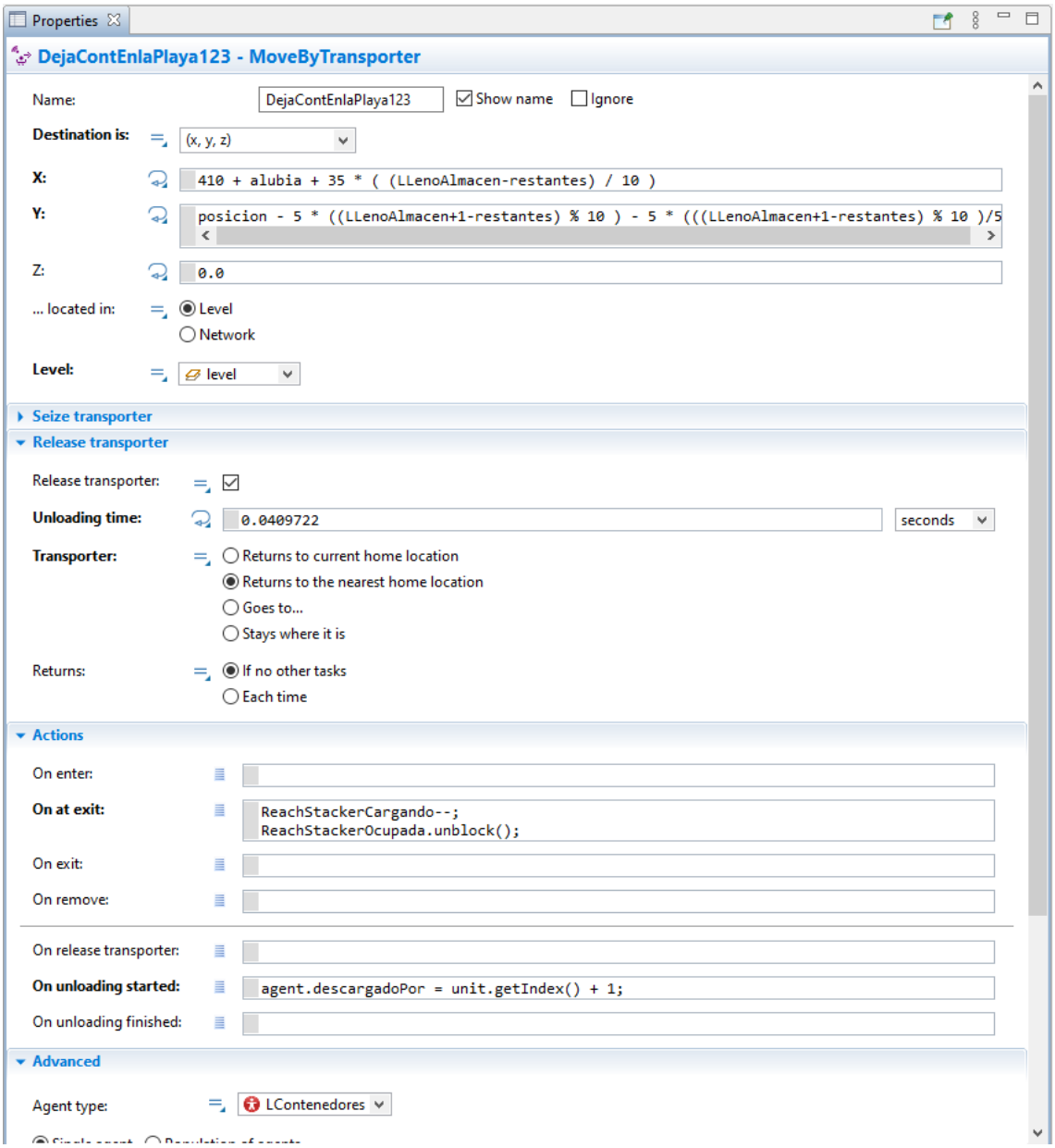

Properties
PasaPorDelantTren2 - MoveByTransporter
Name:
PasaPorDelantTren2
Show name
Ignore
Destination is:
(x, y, z)
X:
870
Y:
270
Z:
0.0
... located in:
Level
Network
Level:
level
Seize transporter
Release transporter
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Material Handling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

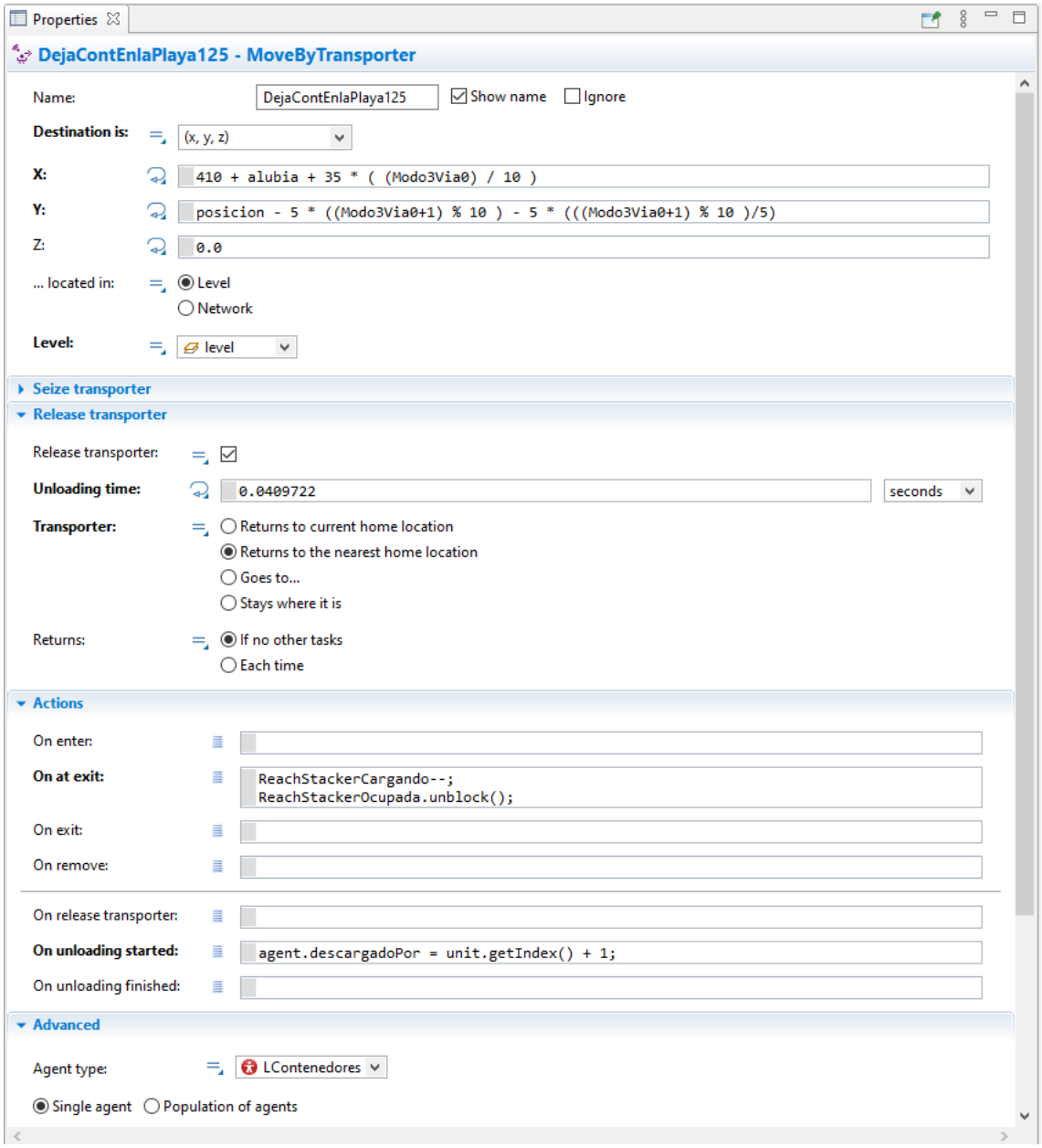

Properties
PasaPorDelantTren3 - MoveByTransporter
Name:
PasaPorDelantTren3
Show name
Ignore
Destination is:
(x, y, z)
X:
870
Y:
fsacaContPuntoY(agent)-15
Z:
0.0
... located in:
Level
Network
Level:
level
Seize transporter
Release transporter
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Material Handling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

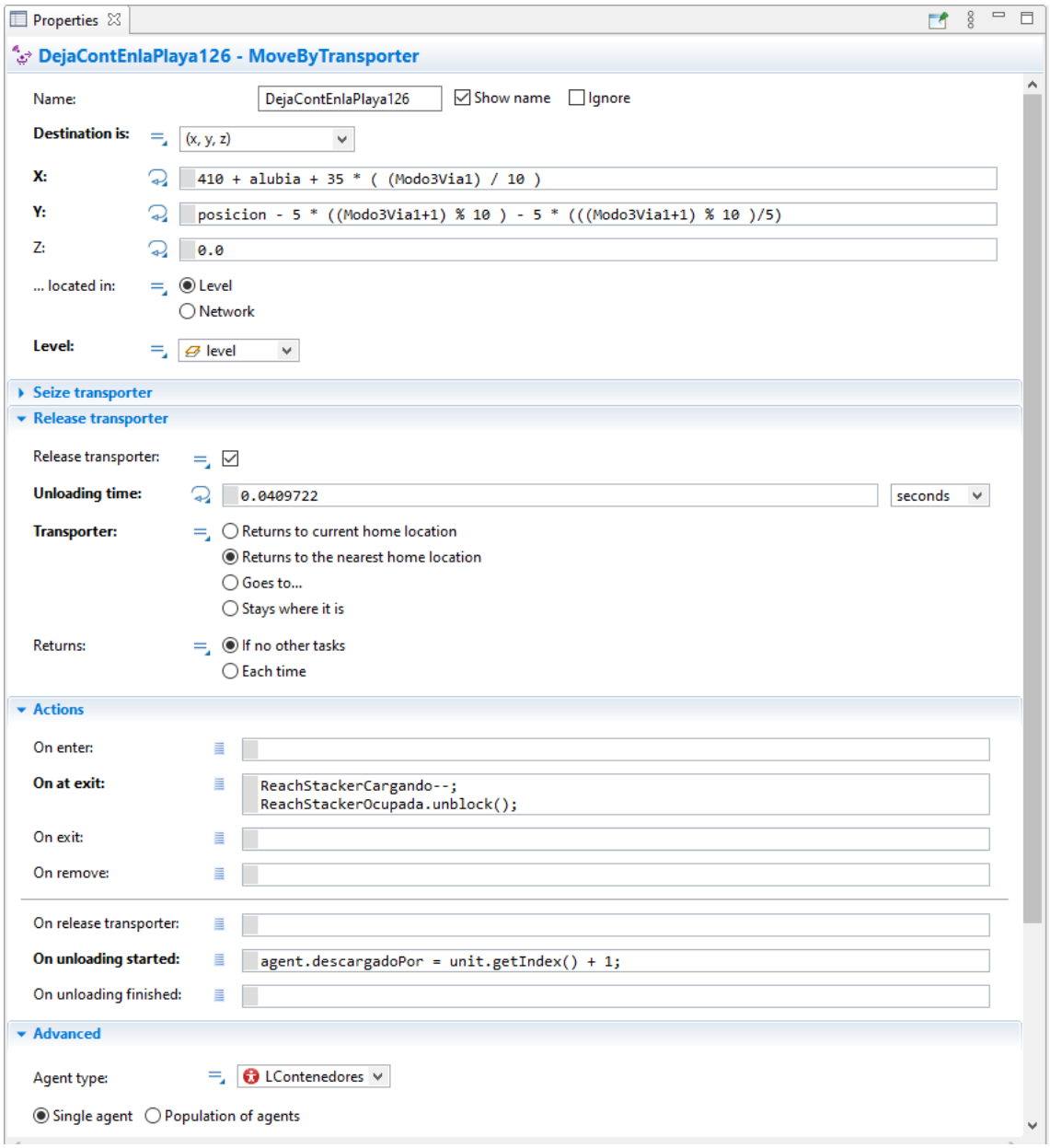

Properties
PasaPorDelantTren4 - MoveByTransporter
Name:
PasaPorDelantTren4
Show name
Ignore
Destination is:
(x, y, z)
X:
870
Y:
270
Z:
0.0
... located in:
Level
Network
Level:
level
Seize transporter
Release transporter
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Material Handling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database

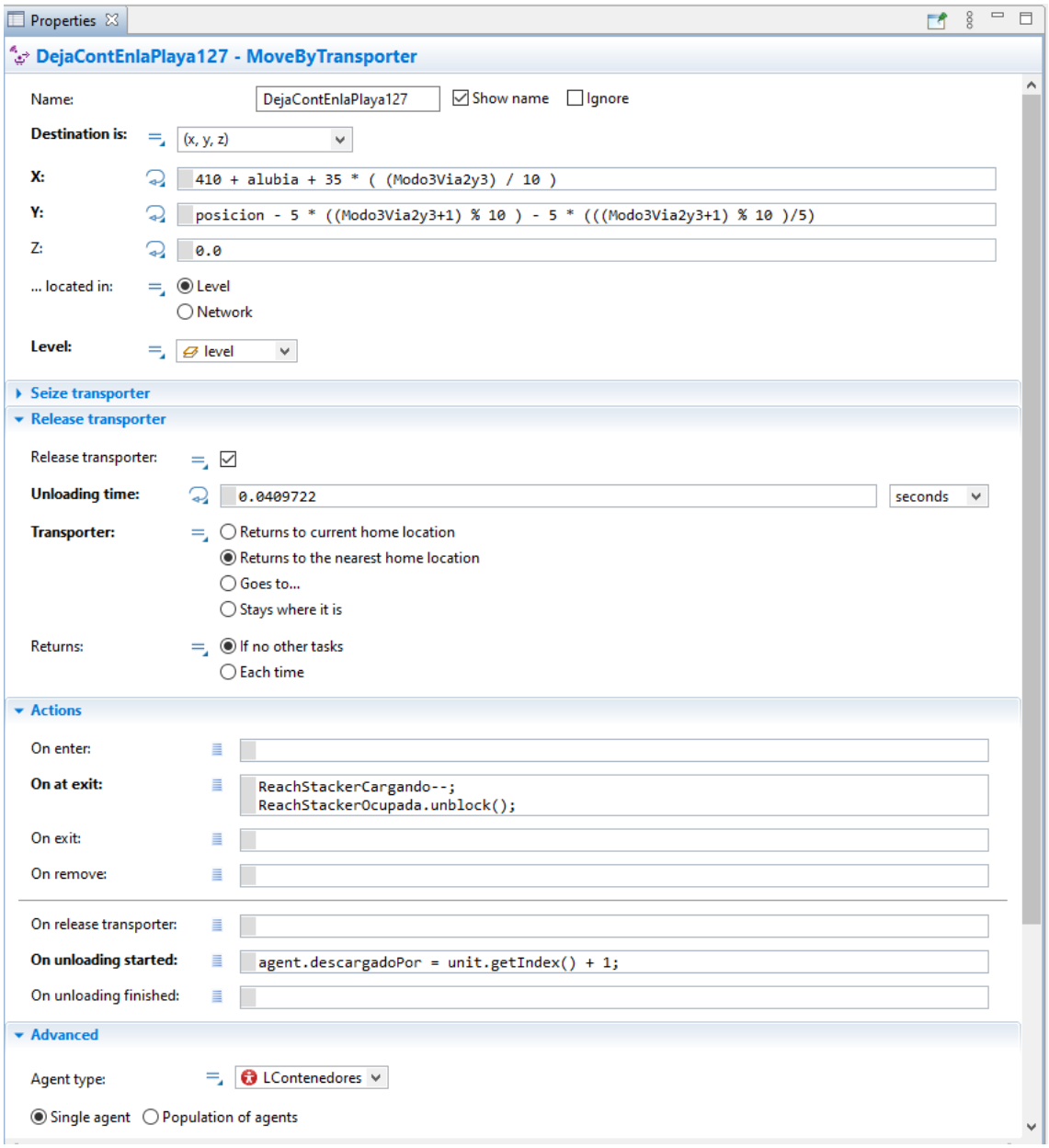

Properties
Via11 - SelectOutput
Name:
Via11
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
MododeDescarga!=3;
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

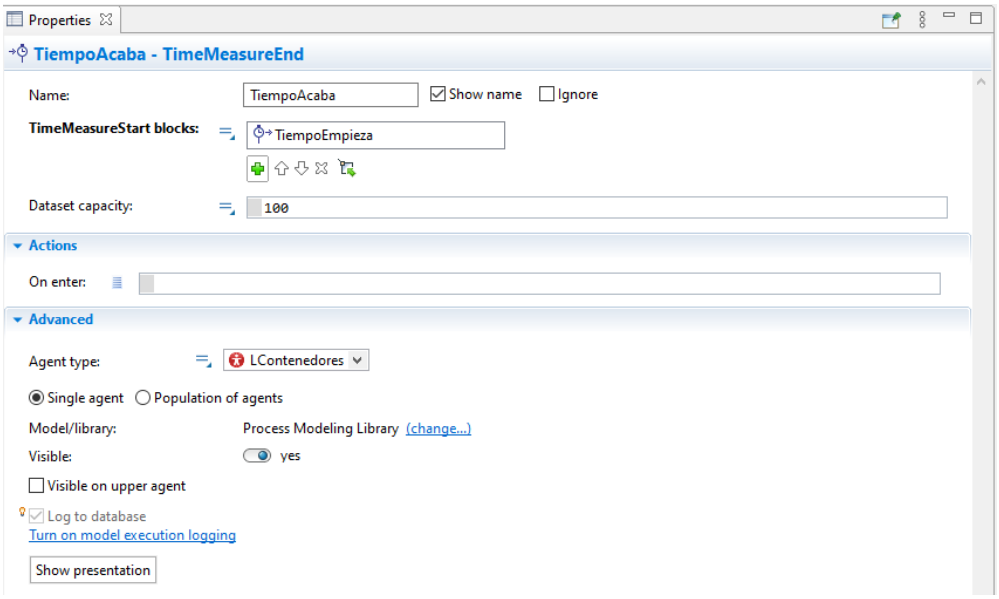

Properties
Via13 - SelectOutput
Name:
Via13
Show name
Ignore
Select True output:
With specified probability [0..1]
If condition is true
Condition:
nmVia==1;
Actions
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

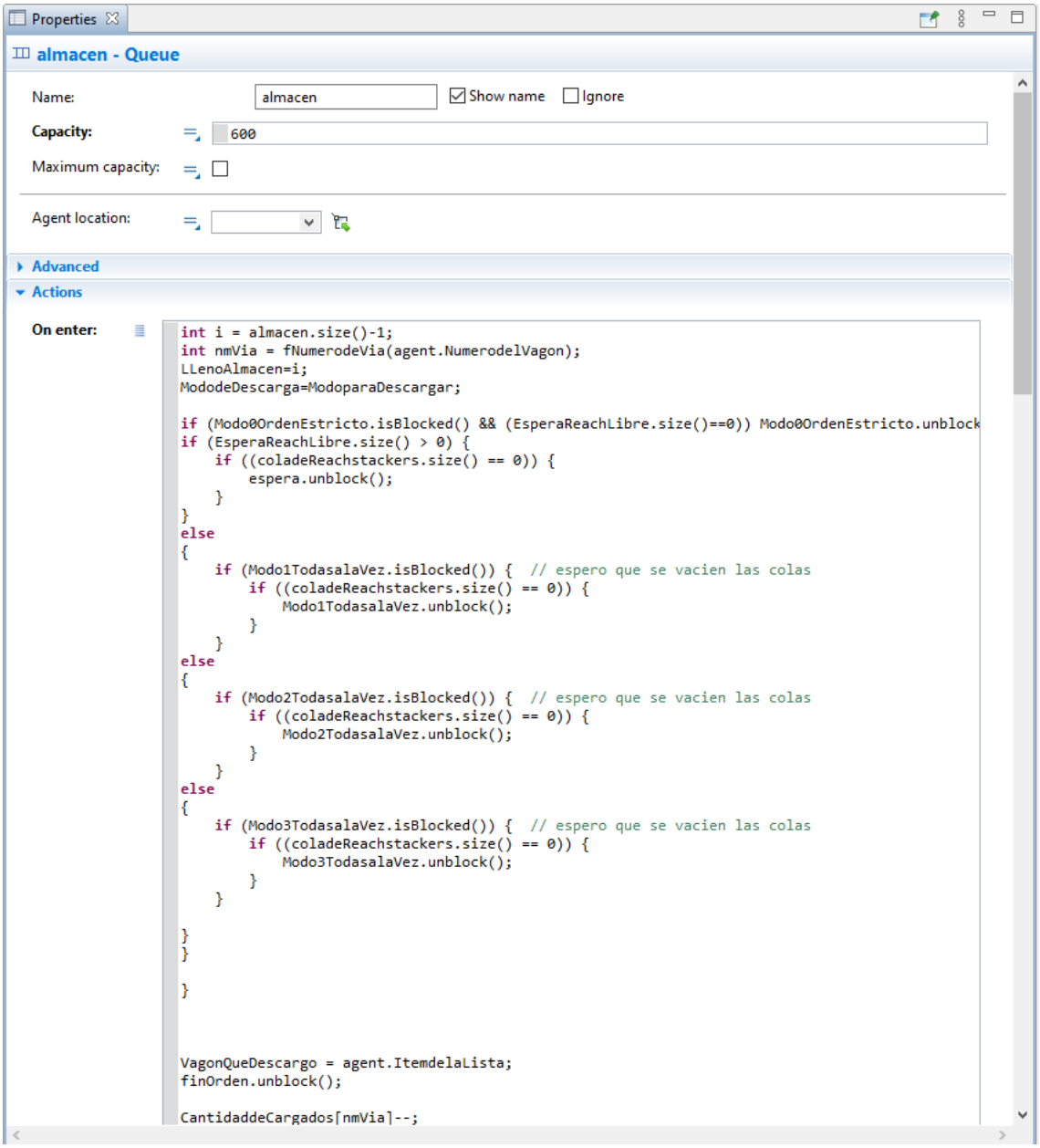

Properties
DejaContEnlaPlaya123 - MoveByTransporter
Name:
DejaContEnlaPlaya123
Show name
Ignore
Destination is:
(x, y, z)
X:
410 + alubia + 35 * ((LLenoAlmacen-restantes) / 10)
Y:
posicion - 5 * ((LLenoAlmacen+1-restantes) % 10) - 5 * (((LLenoAlmacen+1-restantes) % 10)/5
Z:
0.0
... located in:
Level
Network
Level:
level
Seize transporter
Release transporter
Release transporter:
Unloading time:
0.0409722
seconds
Transporter:
Returns to current home location
Returns to the nearest home location
Goes to...
Stays where it is
Returns:
If no other tasks
Each time
Actions
On enter:
On at exit:
ReachStackerCargando--;
ReachStackerOcupada.unblock();
On exit:
On remove:
On release transporter:
On unloading started:
agent.descargadoPor = unit.getIndex() + 1;
On unloading finished:
Advanced
Agent type:
LContenedores


Properties
DejaContEnlaPlaya125 - MoveByTransporter
Name:
DejaContEnlaPlaya125
Show name
Ignore
Destination is:
(x, y, z)
X:
410 + alubia + 35 * ((Modo3Via0) / 10)
Y:
posicion - 5 * ((Modo3Via0+1) % 10) - 5 * (((Modo3Via0+1) % 10)/5)
Z:
0.0
... located in:
Level
Network
Level:
level
Seize transporter
Release transporter
Release transporter:
Unloading time:
0.0409722
seconds
Transporter:
Returns to current home location
Returns to the nearest home location
Goes to...
Stays where it is
Returns:
If no other tasks
Each time
Actions
On enter:
On at exit:
ReachStackerCargando--;
ReachStackerOcupada.unblock();
On exit:
On remove:
On release transporter:
On unloading started:
agent.descargadoPor = unit.getIndex() + 1;
On unloading finished:
Advanced
Agent type:
LContenedores
Single agent
Population of agents


Properties
DejaContEnlaPlaya126 - MoveByTransporter
Name: DejaContEnlaPlaya126 Show name Ignore
Destination is: (x, y, z)
X: 410 + alubia + 35 * ((Modo3Via1) / 10)
Y: posicion - 5 * ((Modo3Via1+1) % 10) - 5 * (((Modo3Via1+1) % 10)/5)
Z: 0.0
... located in: Level Network
Level: level
Seize transporter
Release transporter
Release transporter:
Unloading time: 0.0409722 seconds
Transporter: Returns to current home location Returns to the nearest home location Goes to... Stays where it is
Returns: If no other tasks Each time
Actions
On enter:
On at exit: ReachStackerCargando--; ReachStackerOcupada.unblock();
On exit:
On remove:
On release transporter:
On unloading started: agent.descargadoPor = unit.getIndex() + 1;
On unloading finished:
Advanced
Agent type: LContenedores
Single agent Population of agents


Properties
DejaContEnlaPlaya127 - MoveByTransporter
Name: DejaContEnlaPlaya127 Show name Ignore
Destination is: (x, y, z)
X: 410 + alubia + 35 * ((Modo3Via2y3) / 10)
Y: posicion - 5 * ((Modo3Via2y3+1) % 10) - 5 * (((Modo3Via2y3+1) % 10)/5)
Z: 0.0
... located in: Level Network
Level: level
Seize transporter
Release transporter
Release transporter:
Unloading time: 0.0409722 seconds
Transporter: Returns to current home location; Returns to the nearest home location; Goes to...; Stays where it is
Returns: If no other tasks; Each time
Actions
On enter:
On at exit: ReachStackerCargando--; ReachStackerOcupada.unblock();
On exit:
On remove:
On release transporter:
On unloading started: agent.descargadoPor = unit.getIndex() + 1;
On unloading finished:
Advanced
Agent type: LContenedores
Single agent Population of agents

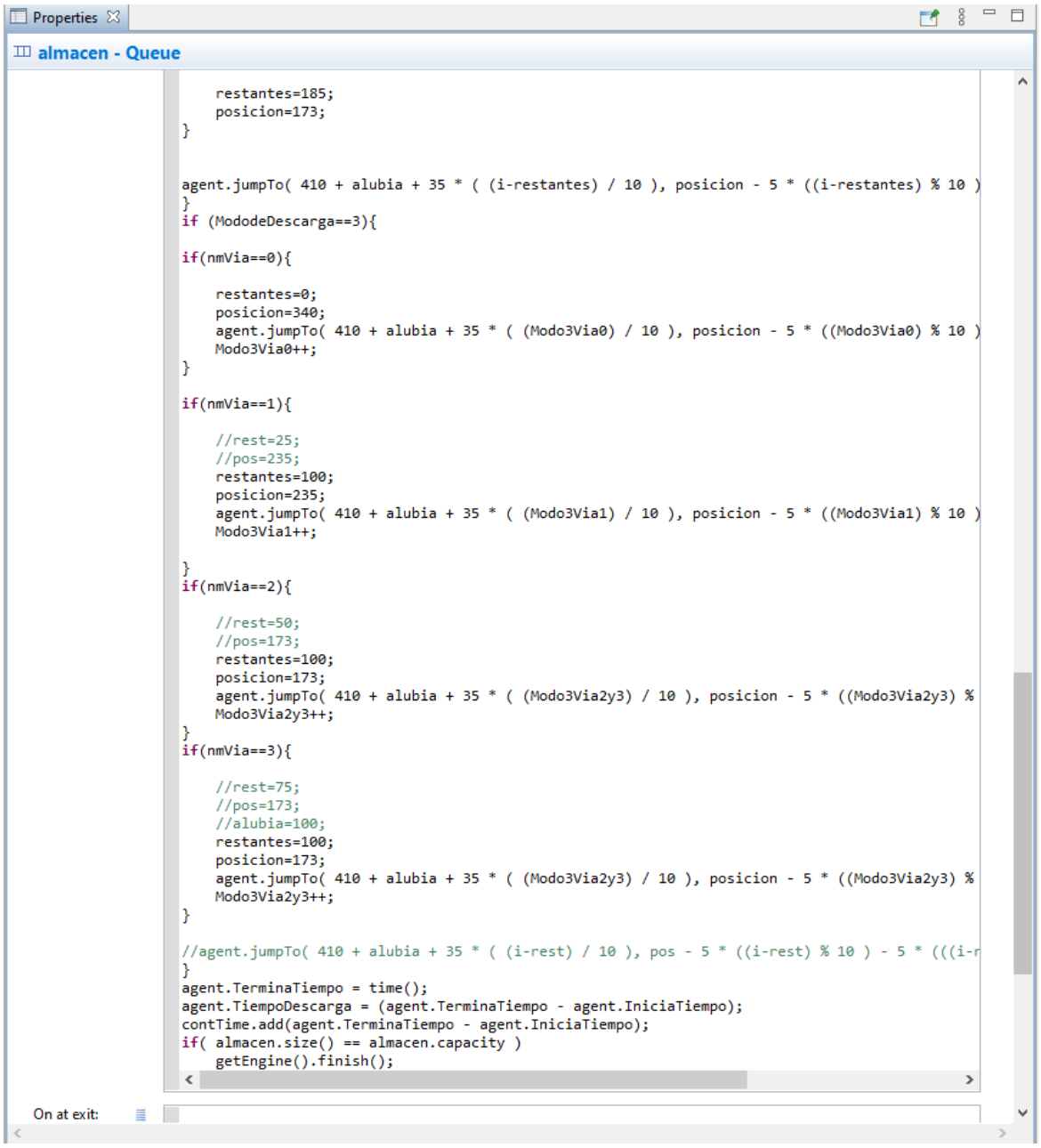

Properties
TiempoAcaba - TimeMeasureEnd
Name:
TiempoAcaba
Show name
Ignore
TimeMeasureStart blocks:
TiempoEmpieza
Dataset capacity:
100
Actions
On enter:
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation

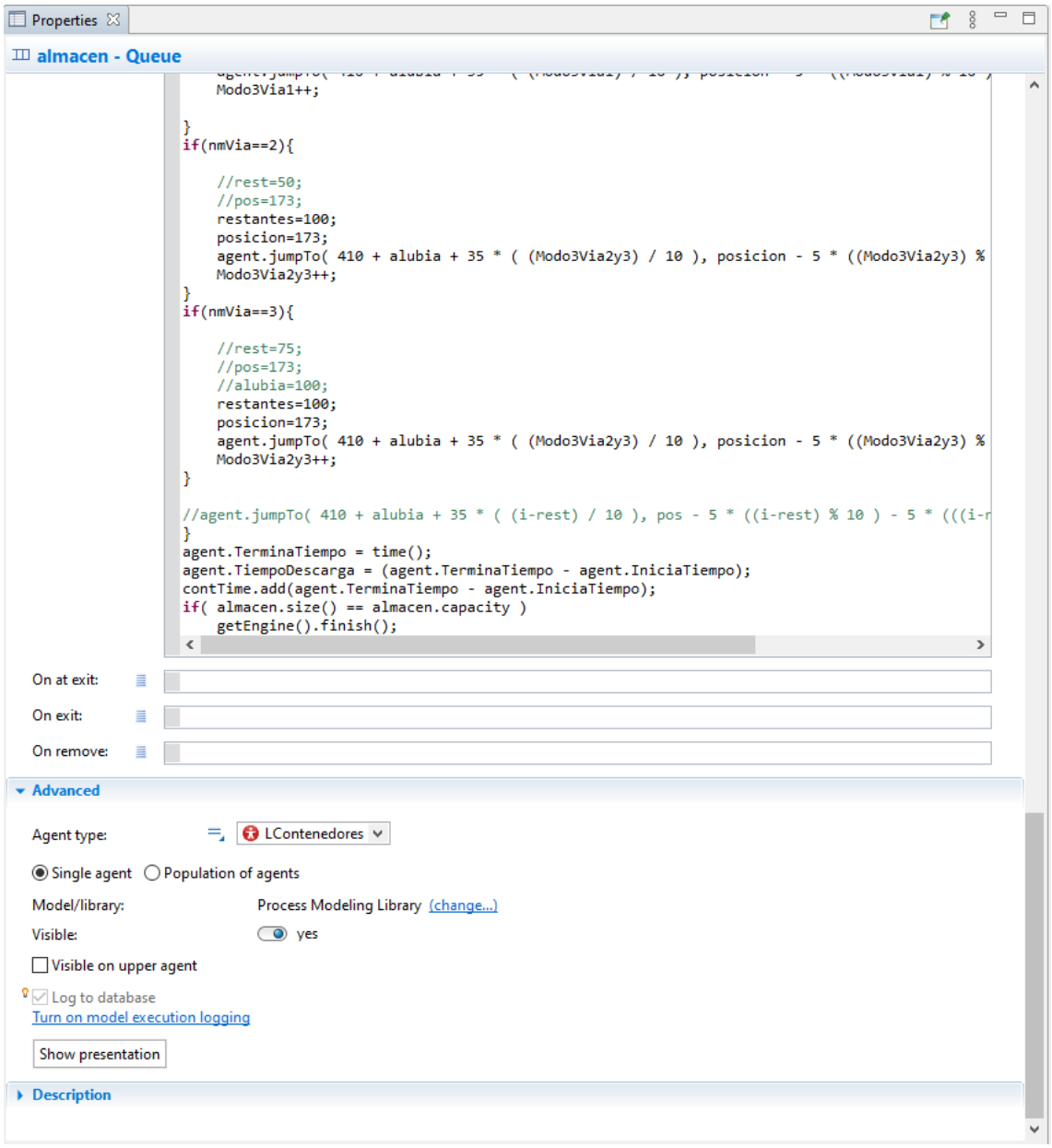

Properties
almacen - Queue
Name:
almacen
Show name
Ignore
Capacity:
600
Maximum capacity:
Agent location:
Advanced
Actions
On enter:
int i = almacen.size()-1;
int nmVia = fNumerodeVia(agent.NumerodelVagon);
LLenoAlmacen=i;
MododeDescarga=ModoparaDescargar;
if (Modo0OrdenEstricto.isBlocked() && (EsperaReachLibre.size()==0)) Modo0OrdenEstricto.unblock
if (EsperaReachLibre.size() > 0) {
if ((coladeReachstackers.size() == 0)) {
espera.unblock();
}
}
else
{
if (Modo1TodasalaVez.isBlocked()) { // espero que se vacien las colas
if ((coladeReachstackers.size() == 0)) {
Modo1TodasalaVez.unblock();
}
}
else
{
if (Modo2TodasalaVez.isBlocked()) { // espero que se vacien las colas
if ((coladeReachstackers.size() == 0)) {
Modo2TodasalaVez.unblock();
}
}
else
{
if (Modo3TodasalaVez.isBlocked()) { // espero que se vacien las colas
if ((coladeReachstackers.size() == 0)) {
Modo3TodasalaVez.unblock();
}
}
}
}
}
VagonQueDescargo = agent.ItemdelaLista;
finOrden.unblock();
CantidaddeCargados[nmVia]--;

Properties

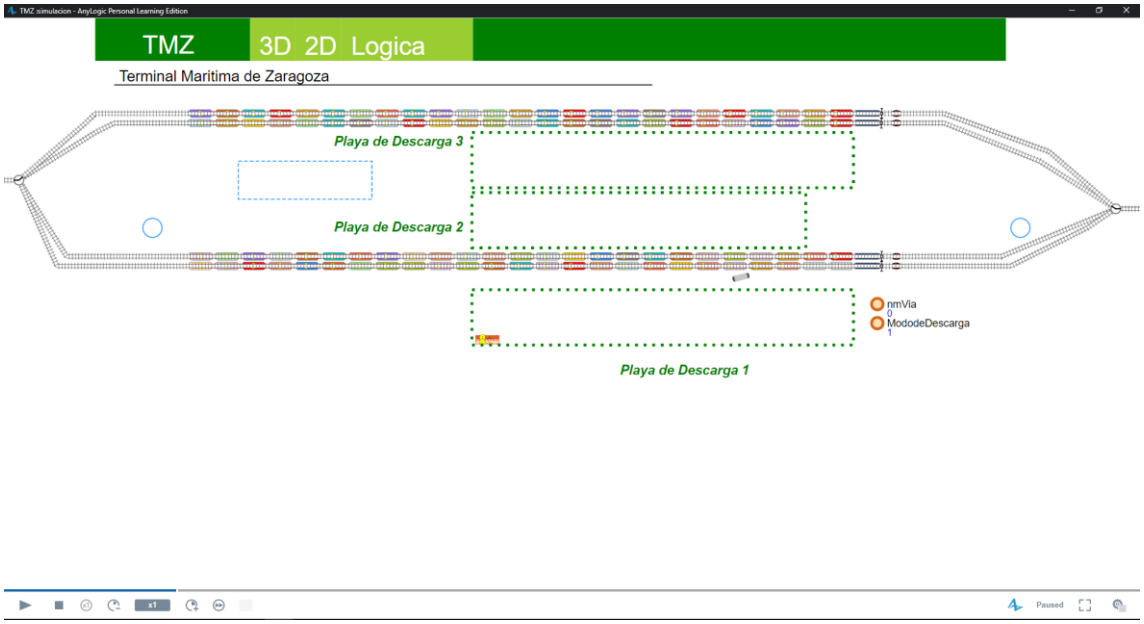
almacen - Queue

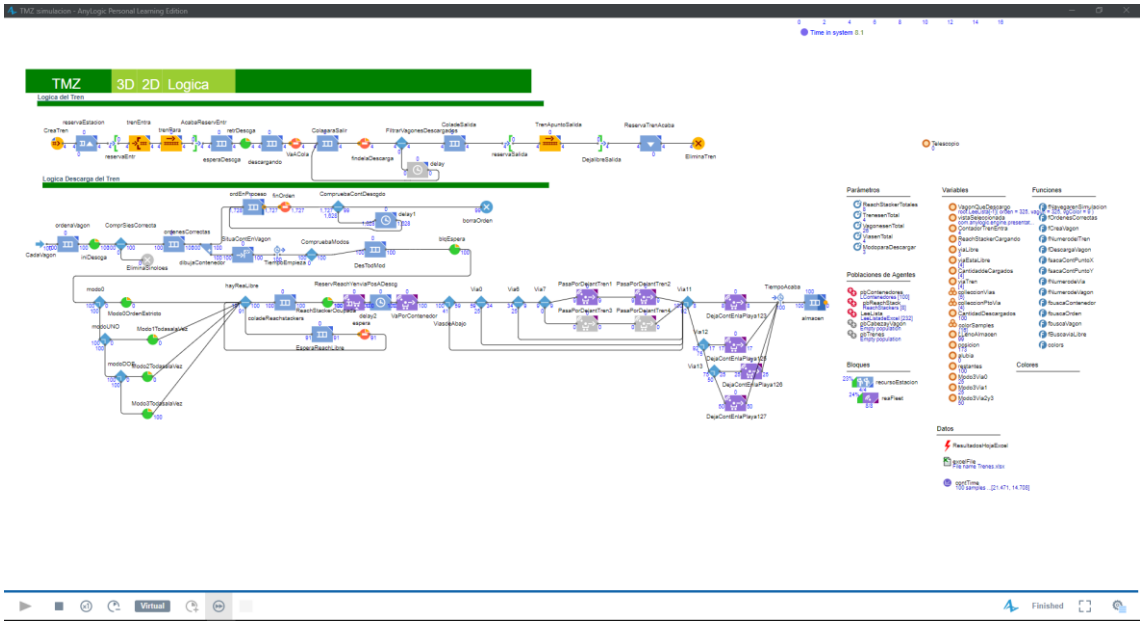
```
CantidaddeCargados[nmVia]--;
viaTren[nmVia].VagonADescargar--;
if (viaTren[nmVia].VagonADescargar == 0) {
    findelaDescarga.unblock();
};


CantidadDescargados++;
if (MododeDescarga==1){
if(i<52){

    restantes=0;
    posicion=340;
}

if(i>=52 && i<85){

    restantes=52;
    posicion=235;
}
if(i>=85 && i<195){

    restantes=85;
    posicion=173;
}
if(i>=195 && i<255){

    restantes=195;
    posicion=235;
    alubia=135;
}

if(i>=255){

    restantes=255;
    posicion=340;
    alubia=205;
}

agent.jumpTo( 410 + alubia + 35 * ( (i-restantes) / 10 ), posicion - 5 * ((i-restantes) % 10 )
}
if (MododeDescarga==2){
if(i<100){

    restantes=0;
    posicion=340;
}

if(i>=100 && i<185){

    restantes=100;
    posicion=235;
}
if(i>=185){

    restantes=185;
    posicion=173;
}
```

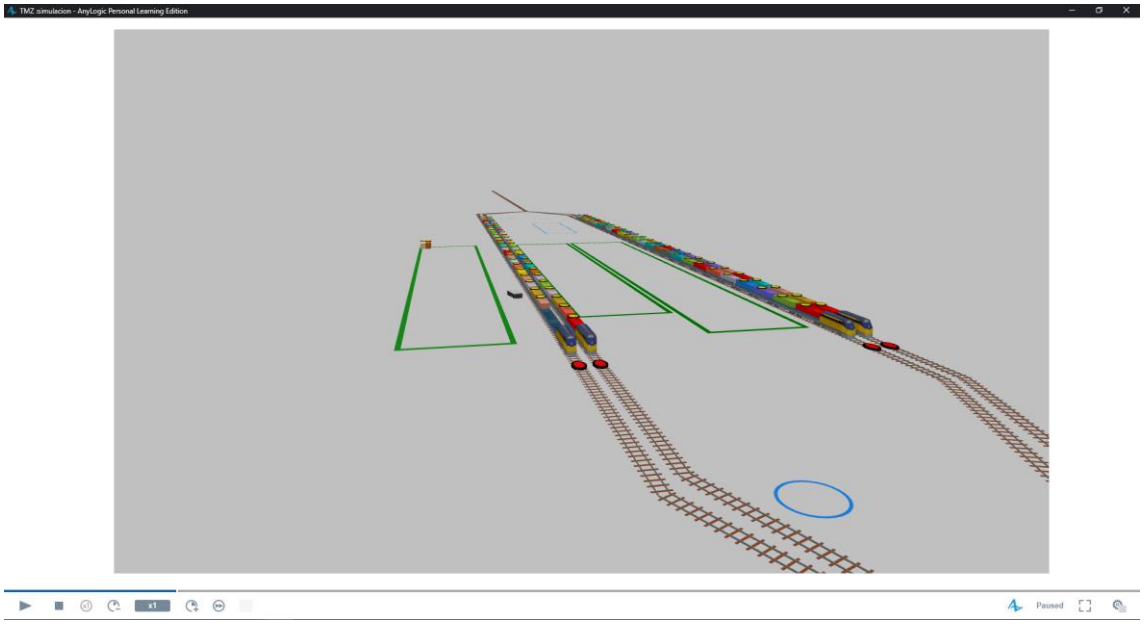

Properties
almacen - Queue
restantes=185;
posicion=173;
}
agent.jumpTo(410 + alubia + 35 * ((i-restantes) / 10), posicion - 5 * ((i-restantes) % 10)
}
if (MododeDescarga==3){
if(nmVia==0){
restantes=0;
posicion=340;
agent.jumpTo(410 + alubia + 35 * ((Modo3Via0) / 10), posicion - 5 * ((Modo3Via0) % 10)
Modo3Via0++;
}
if(nmVia==1){
//rest=25;
//pos=235;
restantes=100;
posicion=235;
agent.jumpTo(410 + alubia + 35 * ((Modo3Via1) / 10), posicion - 5 * ((Modo3Via1) % 10)
Modo3Via1++;
}
if(nmVia==2){
//rest=50;
//pos=173;
restantes=100;
posicion=173;
agent.jumpTo(410 + alubia + 35 * ((Modo3Via2y3) / 10), posicion - 5 * ((Modo3Via2y3) %
Modo3Via2y3++;
}
if(nmVia==3){
//rest=75;
//pos=173;
//alubia=100;
restantes=100;
posicion=173;
agent.jumpTo(410 + alubia + 35 * ((Modo3Via2y3) / 10), posicion - 5 * ((Modo3Via2y3) %
Modo3Via2y3++;
}
//agent.jumpTo(410 + alubia + 35 * ((i-rest) / 10), pos - 5 * ((i-rest) % 10) - 5 * (((i-r
}
agent.TerminaTiempo = time();
agent.TiempoDescarga = (agent.TerminaTiempo - agent.IniciaTiempo);
contTime.add(agent.TerminaTiempo - agent.IniciaTiempo);
if(almacen.size() == almacen.capacity)
getEngine().finish();
On at exit:

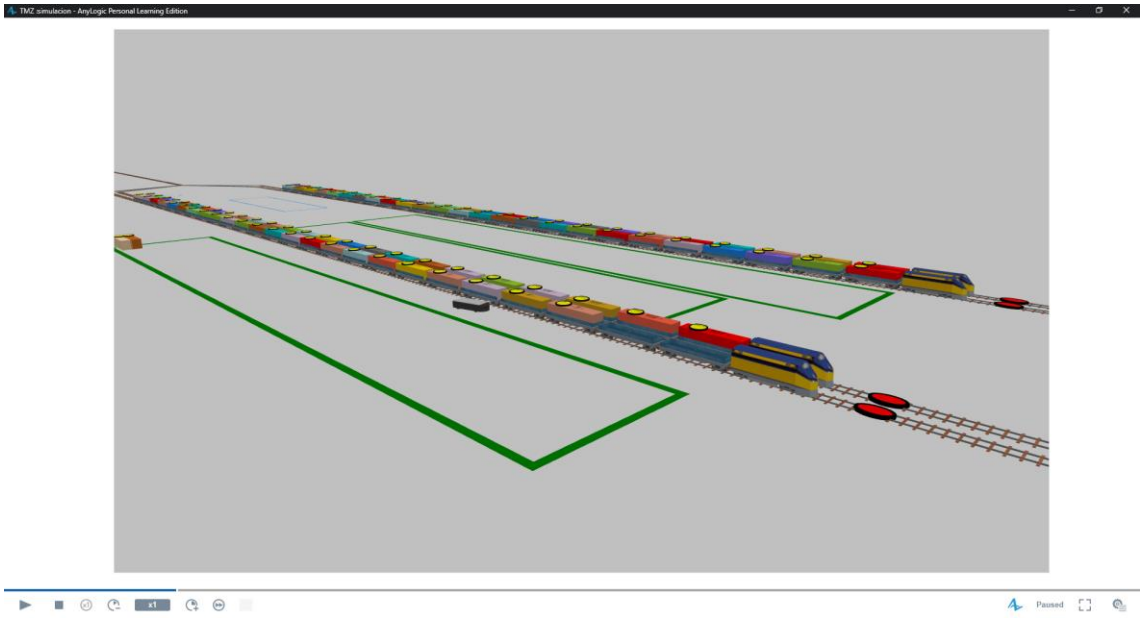

Properties
almacen - Queue
Modo3Via1++;
}
if(nmVia==2){
//rest=50;
//pos=173;
restantes=100;
posicion=173;
agent.jumpTo(410 + alubia + 35 * ((Modo3Via2y3) / 10), posicion - 5 * ((Modo3Via2y3) %
Modo3Via2y3++;
}
if(nmVia==3){
//rest=75;
//pos=173;
//alubia=100;
restantes=100;
posicion=173;
agent.jumpTo(410 + alubia + 35 * ((Modo3Via2y3) / 10), posicion - 5 * ((Modo3Via2y3) %
Modo3Via2y3++;
}
//agent.jumpTo(410 + alubia + 35 * ((i-rest) / 10), pos - 5 * ((i-rest) % 10) - 5 * (((i-r
}
agent.TerminaTiempo = time();
agent.TiempoDescarga = (agent.TerminaTiempo - agent.IniciaTiempo);
contTime.add(agent.TerminaTiempo - agent.IniciaTiempo);
if(almacen.size() == almacen.capacity)
getEngine().finish();
On at exit:
On exit:
On remove:
Advanced
Agent type:
LContenedores
Single agent
Population of agents
Model/library:
Process Modeling Library
(change...)
Visible:
yes
Visible on upper agent
Log to database
Turn on model execution logging
Show presentation
Description

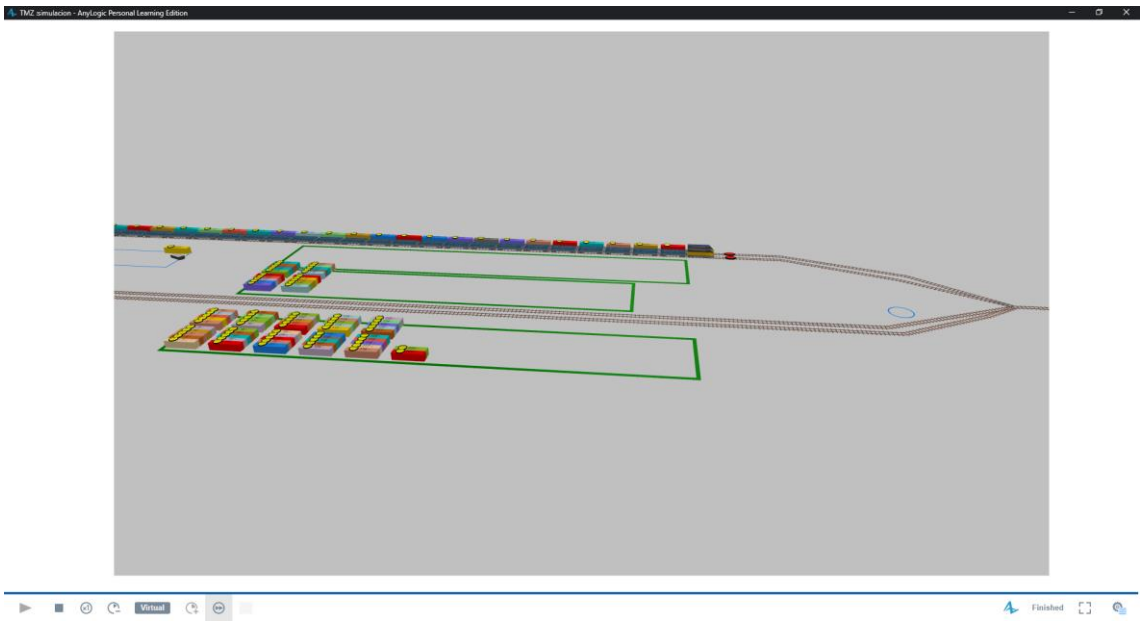
ANEXO 7: SIMULACIÓN

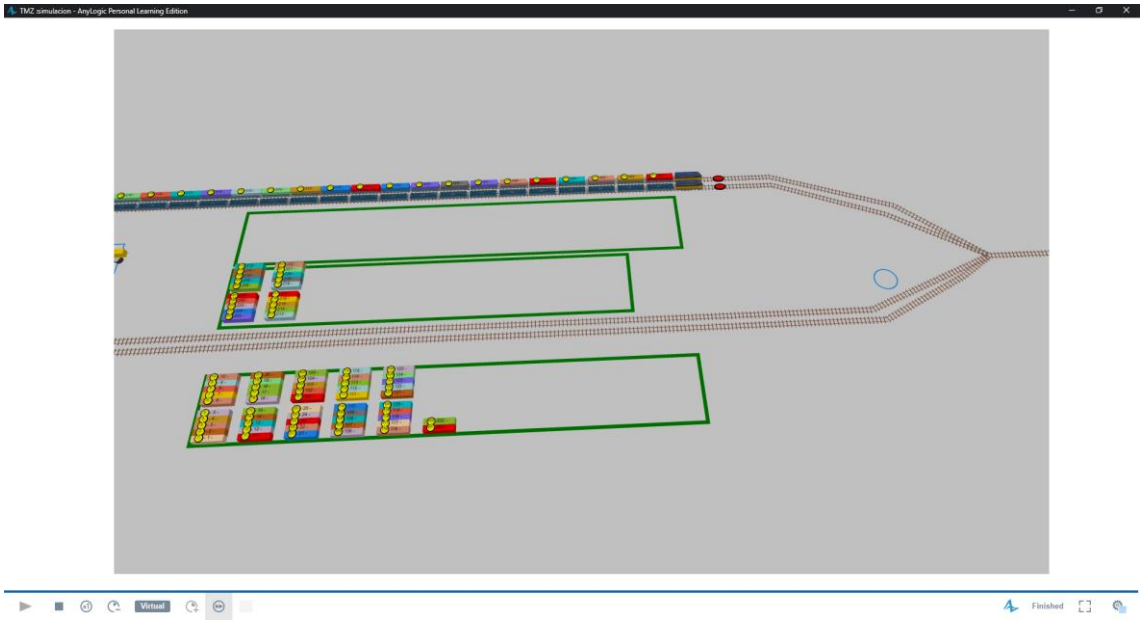


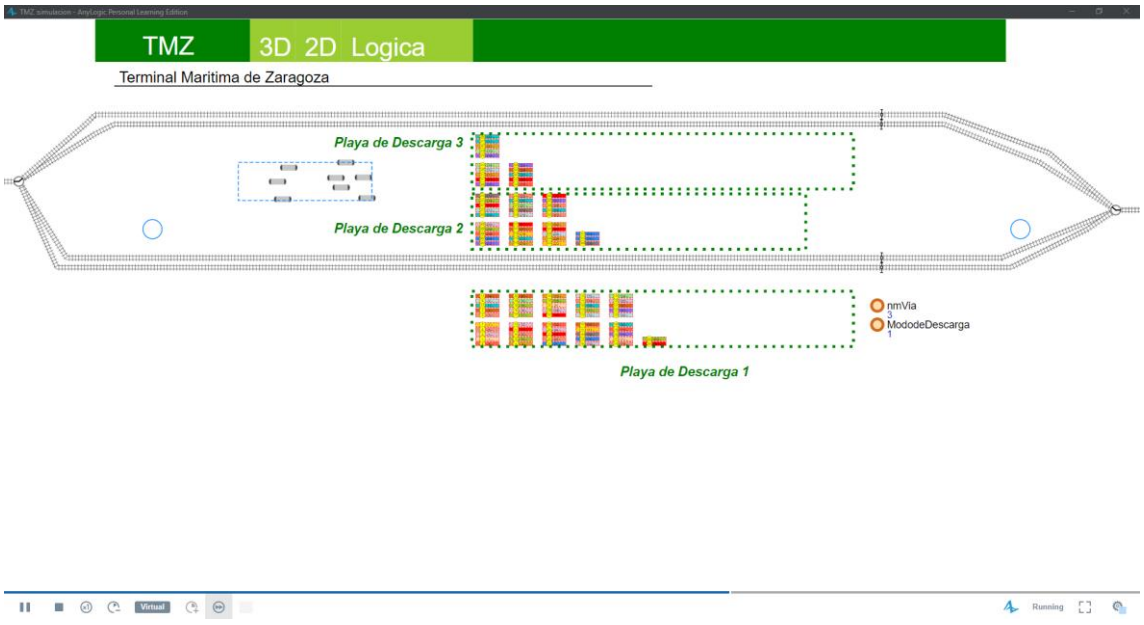


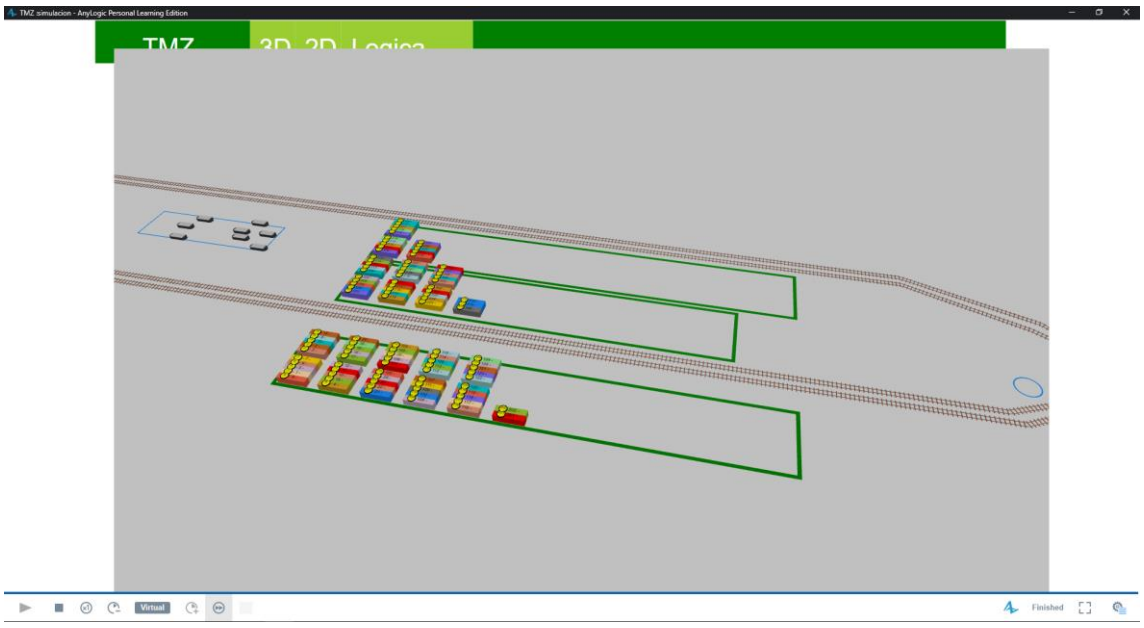

TMZ simulacion - AnyLogic Personal Learning Edition
x1
Paused

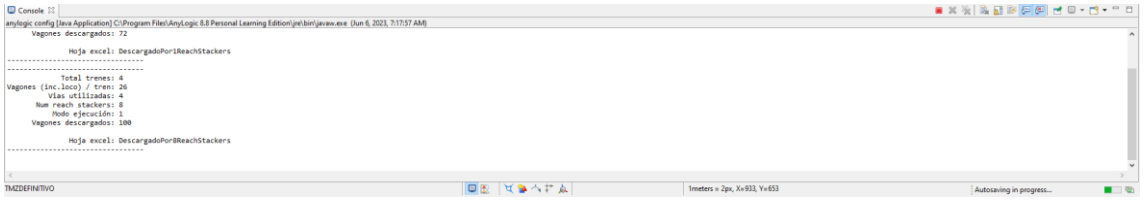

TMZ simulacion - AnyLogic Personal Learning Edition
x1
Paused

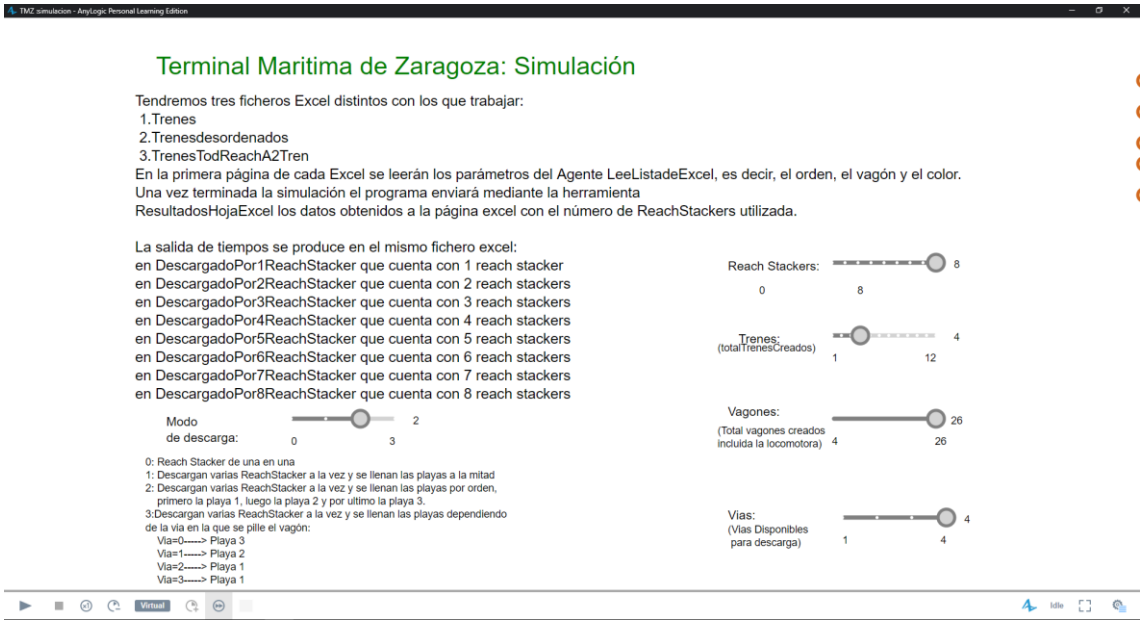

TMZ simulacion - AnyLogic Personal Learning Edition
Virtual
Finished

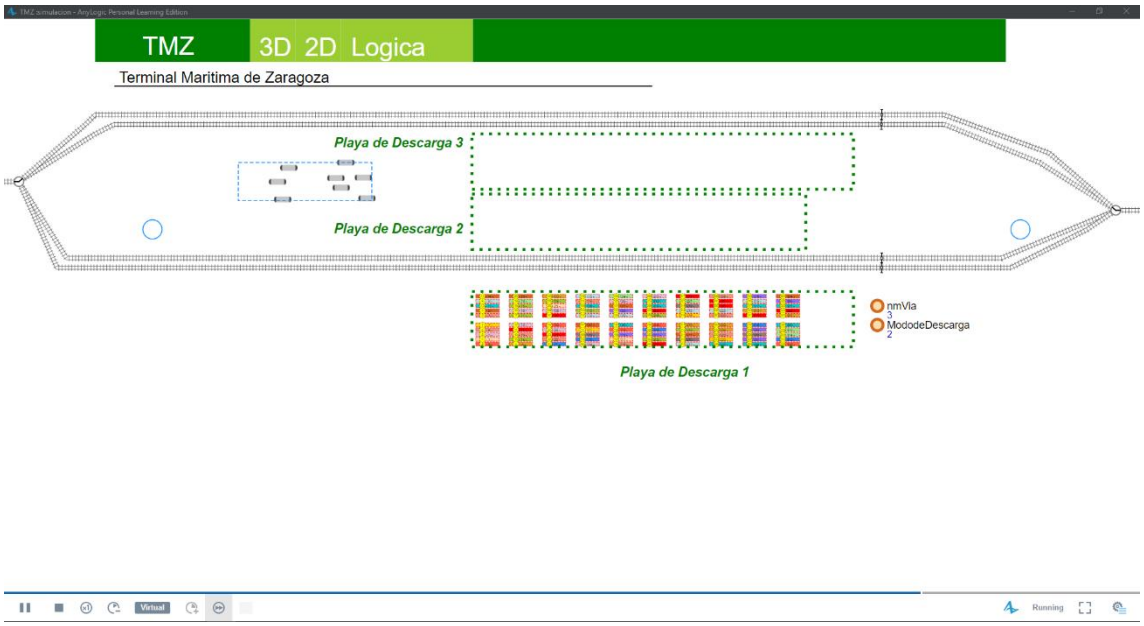

TMZ simulacion - AnyLogic Personal Learning Edition
Virtual
Finished

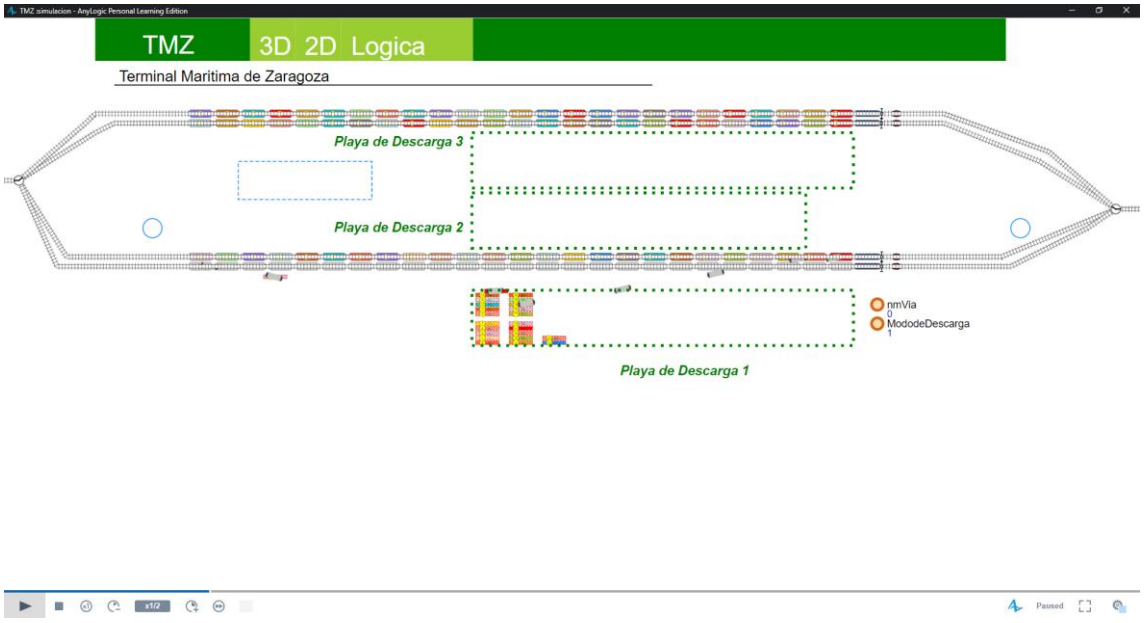

TMZ
3D 2D Logica
Terminal Maritima de Zaragoza
Playa de Descarga 3
Playa de Descarga 2
Playa de Descarga 1
nmVia
3
MododeDescarga
1
Virtual
Running

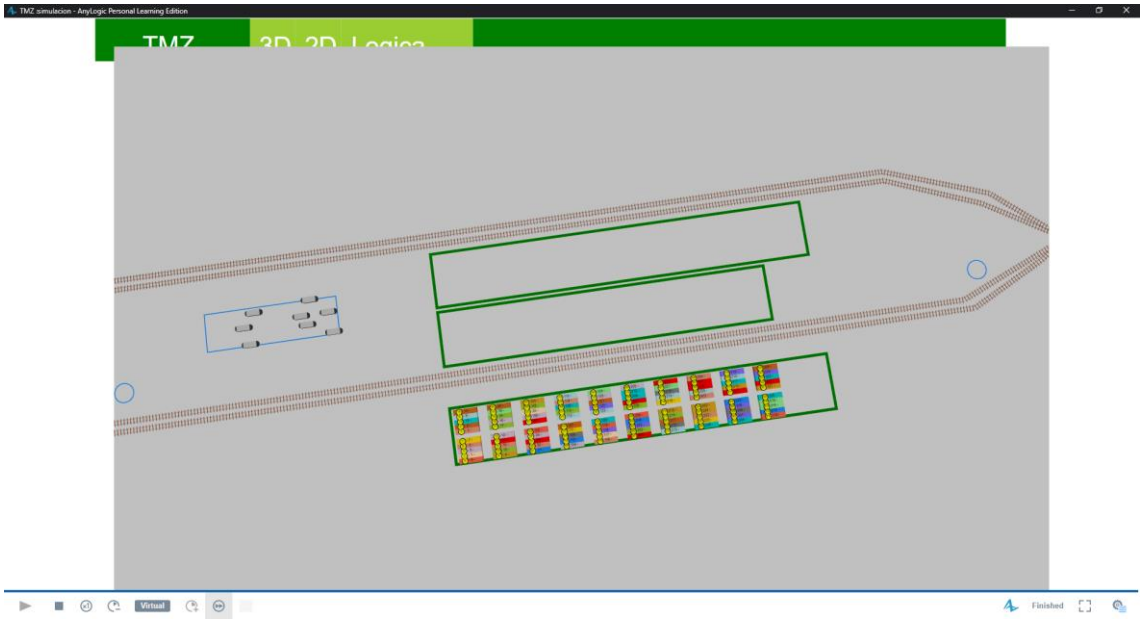

Virtual
Finished

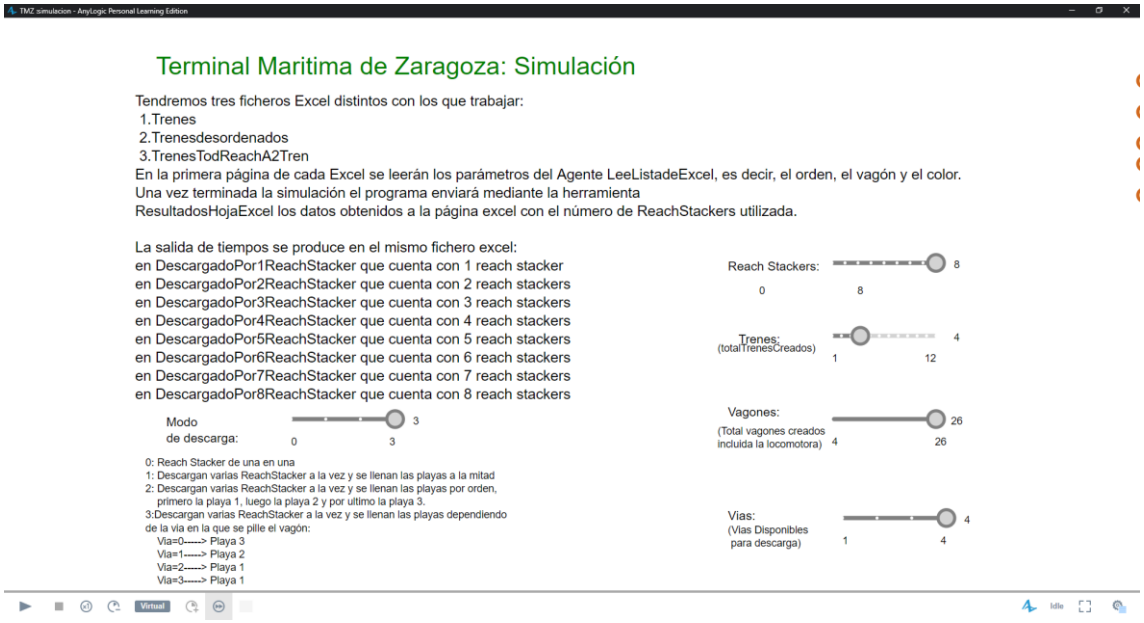

Vagones descargados: 72
Hoja excel: DescargadoPor1ReachStackers
Total trenes: 4
Vagones (inc.loco) / tren: 26
Vias utilizadas: 4
Num reach stackers: 8
Modo ejecución: 1
Vagones descargados: 100
Hoja excel: DescargadoPor8ReachStackers
TMZDEFINITIVO

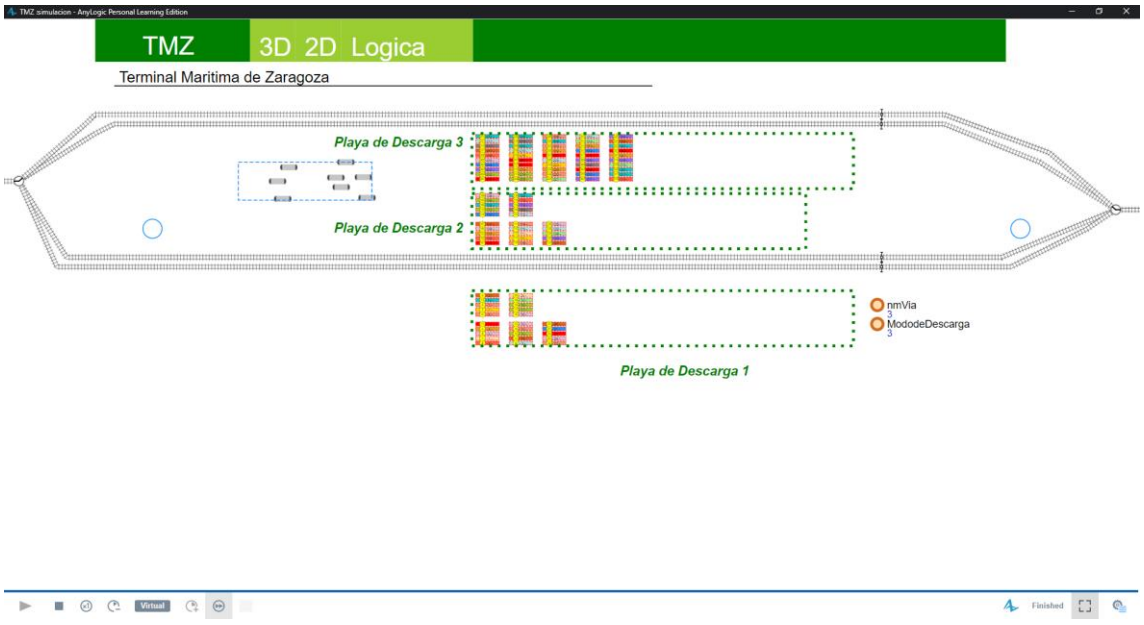

TMZ simulacion - AnyLogic Personal Learning Edition
Terminal Maritima de Zaragoza: Simulación
Tendremos tres ficheros Excel distintos con los que trabajar:
1.Trenes
2.Trenesdesordenados
3.TrenesTodReachA2Tren
En la primera página de cada Excel se leerán los parámetros del Agente LeeListadeExcel, es decir, el orden, el vagón y el color.
Una vez terminada la simulación el programa enviará mediante la herramienta
ResultadosHojaExcel los datos obtenidos a la página excel con el número de ReachStackers utilizada.
La salida de tiempos se produce en el mismo fichero excel:
en DescargadoPor1ReachStacker que cuenta con 1 reach stacker
en DescargadoPor2ReachStacker que cuenta con 2 reach stackers
en DescargadoPor3ReachStacker que cuenta con 3 reach stackers
en DescargadoPor4ReachStacker que cuenta con 4 reach stackers
en DescargadoPor5ReachStacker que cuenta con 5 reach stackers
en DescargadoPor6ReachStacker que cuenta con 6 reach stackers
en DescargadoPor7ReachStacker que cuenta con 7 reach stackers
en DescargadoPor8ReachStacker que cuenta con 8 reach stackers
Modo de descarga:
0: Reach Stacker de una en una
1: Descargan varias ReachStacker a la vez y se llenan las playas a la mitad
2: Descargan varias ReachStacker a la vez y se llenan las playas por orden, primero la playa 1, luego la playa 2 y por ultimo la playa 3.
3:Descargan varias ReachStacker a la vez y se llenan las playas dependiendo de la via en la que se pille el vagón:
Via=0-----> Playa 3
Via=1-----> Playa 2
Via=2-----> Playa 1
Via=3-----> Playa 1
Reach Stackers:
Trenes: (totalTrenesCreados)
Vagones: (Total vagones creados incluida la locomotora)
Vias: (Vias Disponibles para descarga)
Virtual
Idle

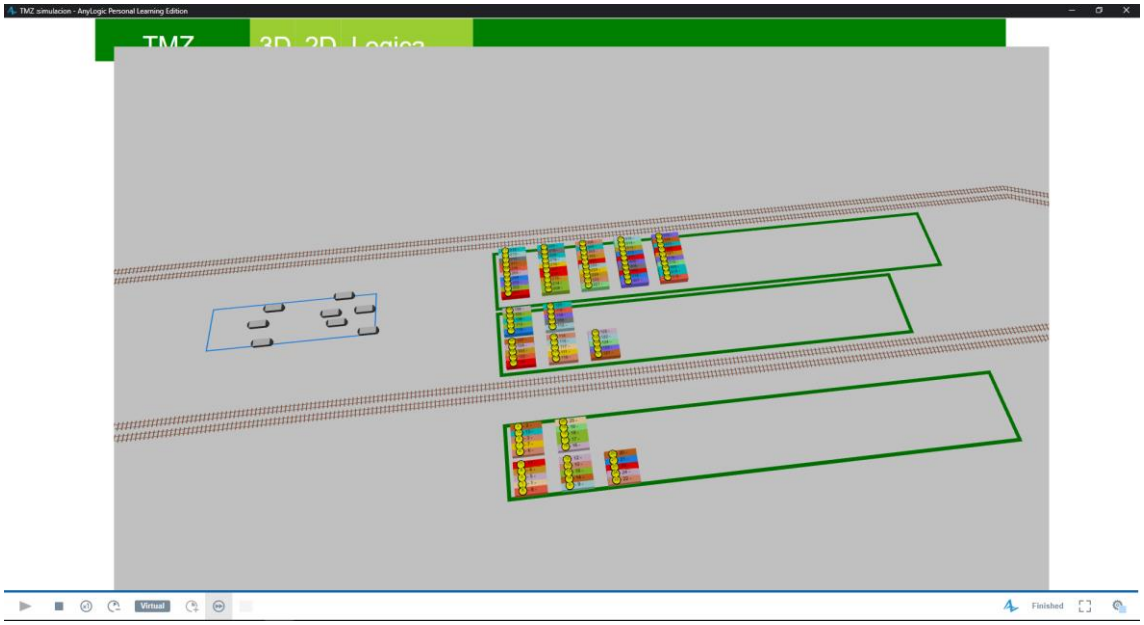

TMZ simulacion - AnyLogic Personal Learning Edition
TMZ
3D 2D Logica
Terminal Maritima de Zaragoza
Playa de Descarga 3
Playa de Descarga 2
Playa de Descarga 1
nmVia
MododeDescarga
Virtual
Running


TMZ simulacion - AnyLogic Personal Learning Edition
TMZ
3D 2D Logica
Terminal Maritima de Zaragoza
Playa de Descarga 3
Playa de Descarga 2
Playa de Descarga 1
nmVia
0
MododeDescarga
1
x1/2
Paused


TMZ simulacion - AnyLogic Personal Learning Edition
Virtual
Finished

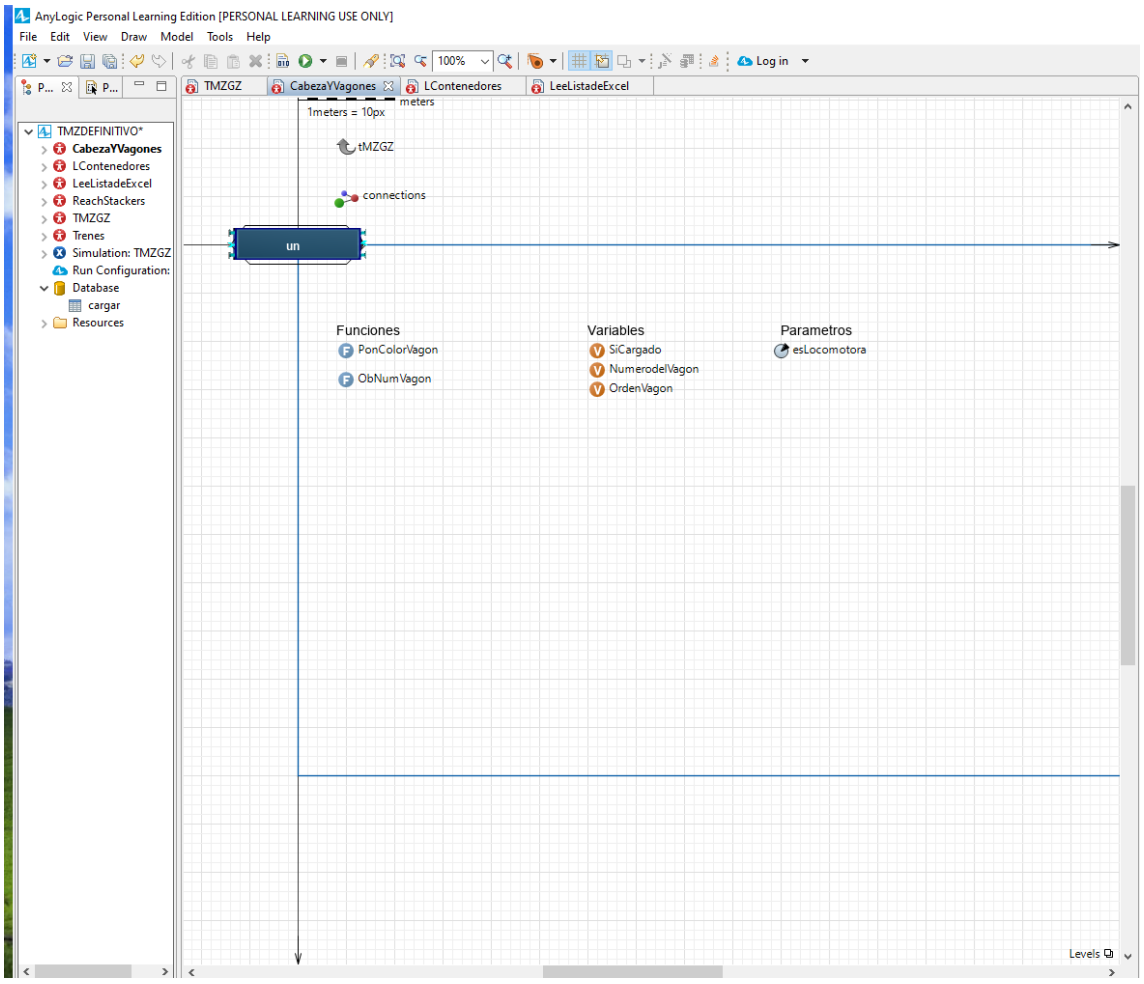

TMZ simulacion - AnyLogic Personal Learning Edition
Terminal Maritima de Zaragoza: Simulación
Tendremos tres ficheros Excel distintos con los que trabajar:
1.Trenes
2.Trenesdesordenados
3.TrenesTodReachA2Tren
En la primera página de cada Excel se leerán los parámetros del Agente LeeListadeExcel, es decir, el orden, el vagón y el color.
Una vez terminada la simulación el programa enviará mediante la herramienta
ResultadosHojaExcel los datos obtenidos a la página excel con el número de ReachStackers utilizada.
La salida de tiempos se produce en el mismo fichero excel:
en DescargadoPor1ReachStacker que cuenta con 1 reach stacker
en DescargadoPor2ReachStacker que cuenta con 2 reach stackers
en DescargadoPor3ReachStacker que cuenta con 3 reach stackers
en DescargadoPor4ReachStacker que cuenta con 4 reach stackers
en DescargadoPor5ReachStacker que cuenta con 5 reach stackers
en DescargadoPor6ReachStacker que cuenta con 6 reach stackers
en DescargadoPor7ReachStacker que cuenta con 7 reach stackers
en DescargadoPor8ReachStacker que cuenta con 8 reach stackers
Modo de descarga:
0
3
3
0: Reach Stacker de una en una
1: Descargan varias ReachStacker a la vez y se llenan las playas a la mitad
2: Descargan varias ReachStacker a la vez y se llenan las playas por orden, primero la playa 1, luego la playa 2 y por ultimo la playa 3.
3:Descargan varias ReachStacker a la vez y se llenan las playas dependiendo de la via en la que se pille el vagón:
Via=0-----> Playa 3
Via=1-----> Playa 2
Via=2-----> Playa 1
Via=3-----> Playa 1
Reach Stackers:
0
8
8
Trenes:
(totalTrenesCreados)
1
12
4
Vagones:
(Total vagones creados incluida la locomotora)
4
26
26
Vias:
(Vias Disponibles para descarga)
1
4
4
Virtual
Idle


TMZ simulacion - AnyLogic Personal Learning Edition
TMZ
3D 2D Logica
Terminal Maritima de Zaragoza
Playa de Descarga 3
Playa de Descarga 2
Playa de Descarga 1
nmVia
3
MododeDescarga
3
Virtual
Finished

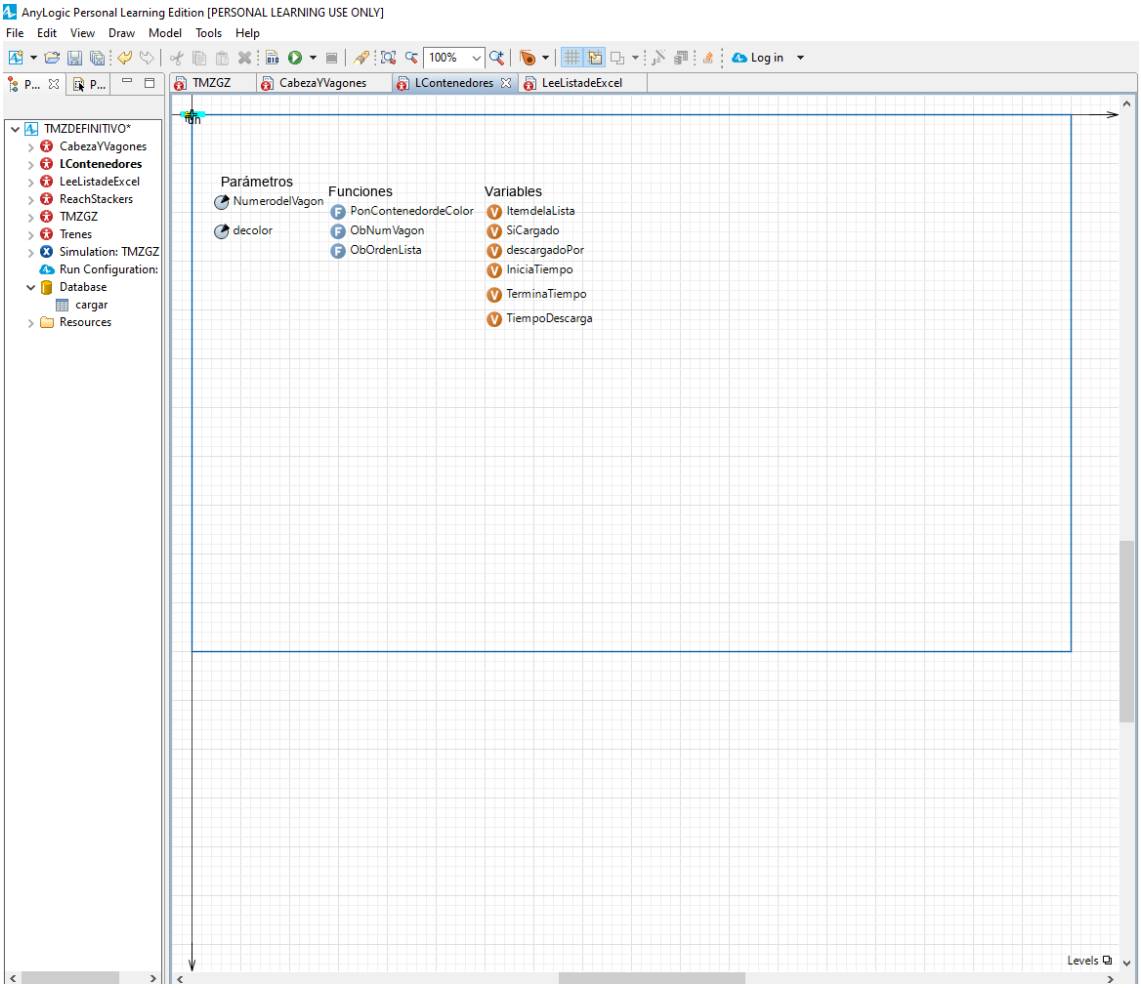


ANEXO 8: AGENTES

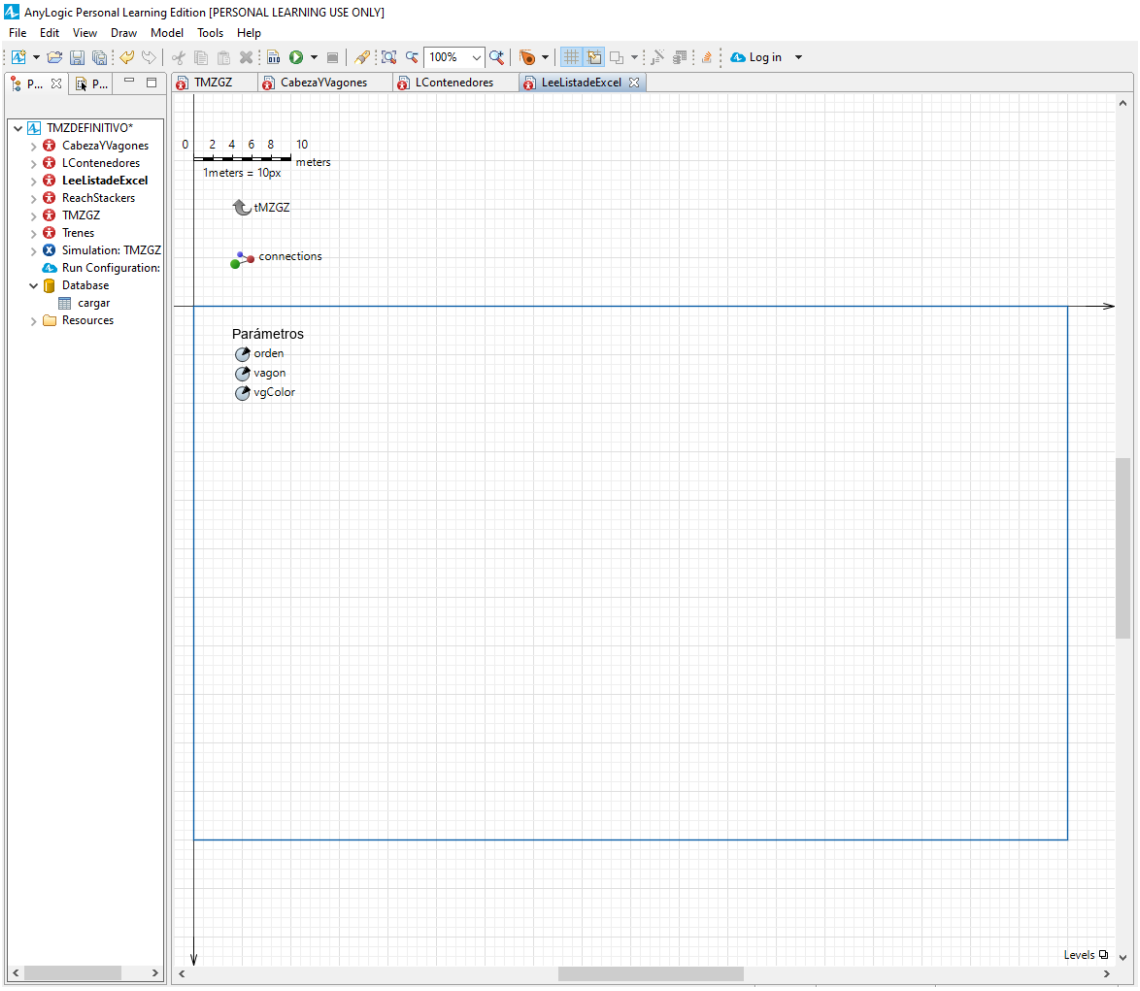
Agente CabezaYVagones



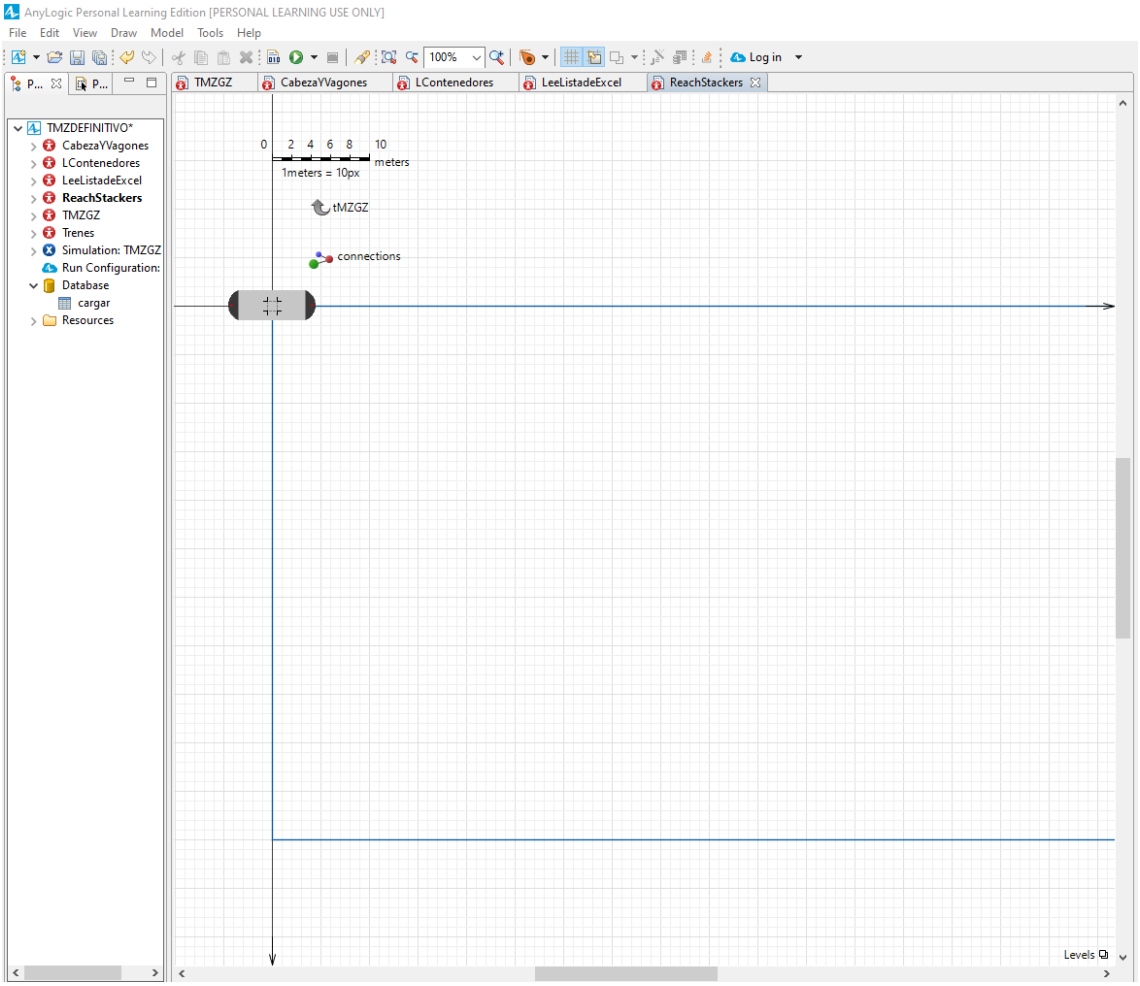
Agente LContenedores



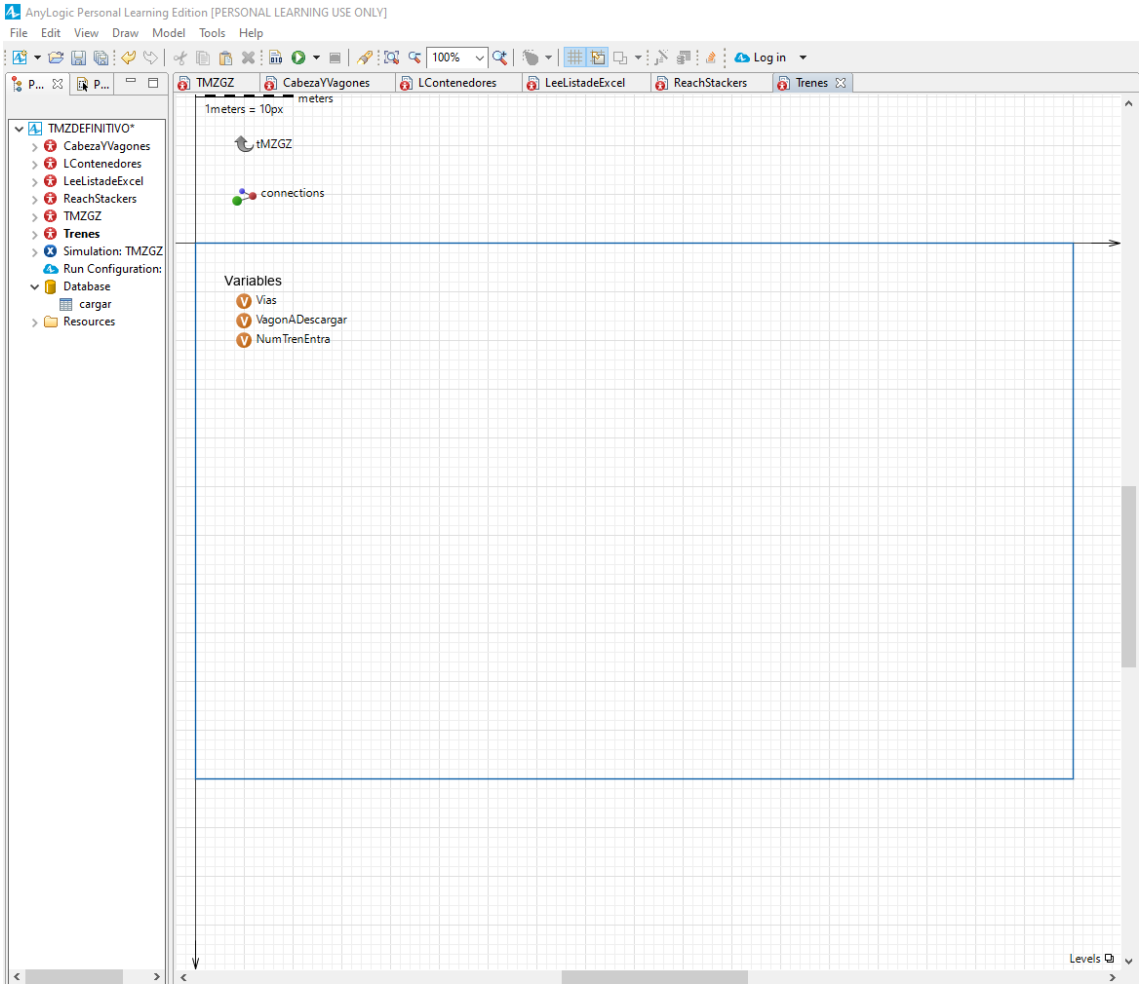
Agente LeeListadeExcel



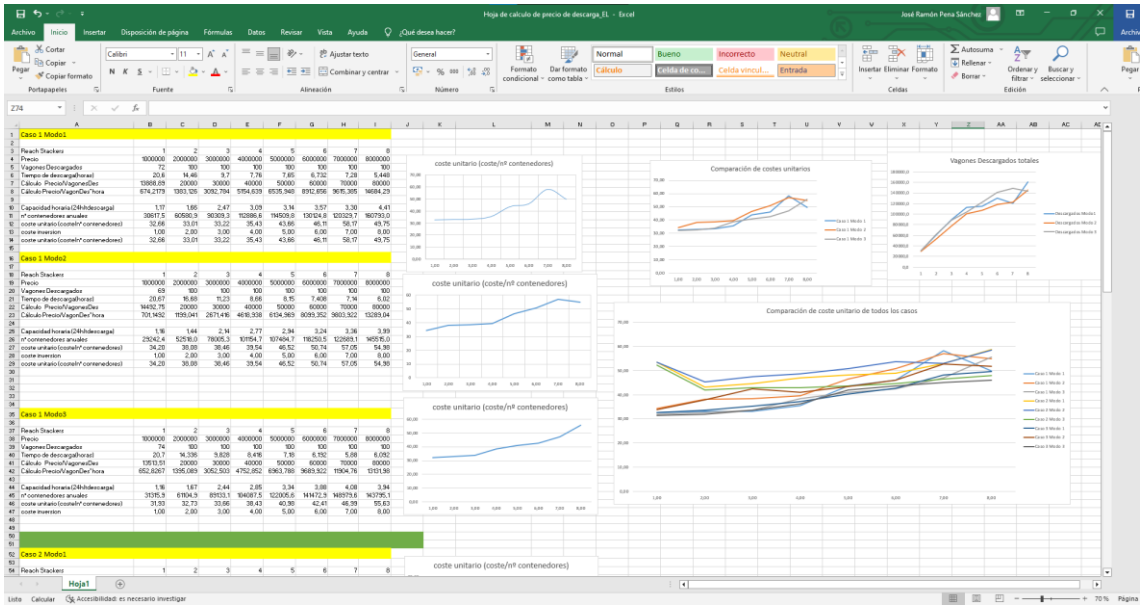
Agente ReachStackers

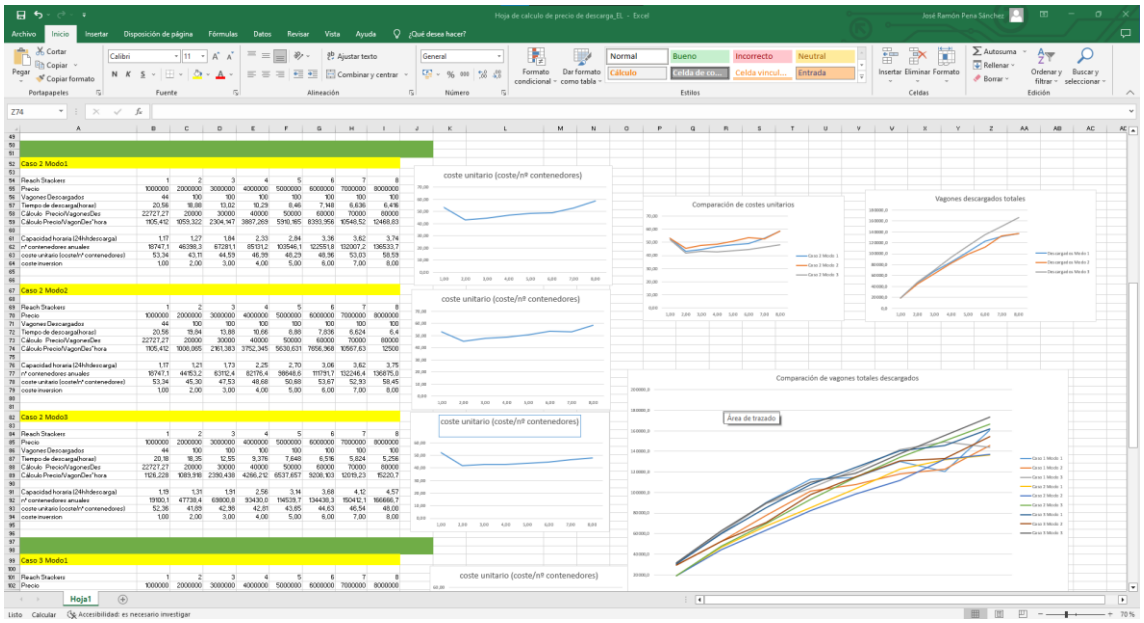


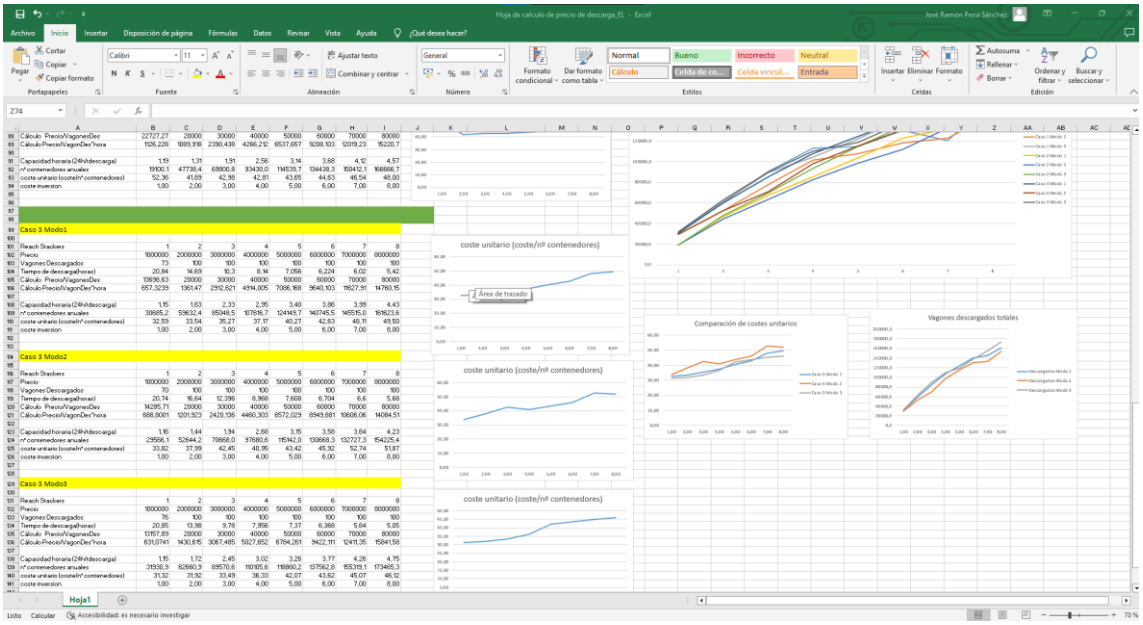
Agente Trenes



ANEXO 8: EXCEL DE GRÁFICAS Y RESULTADOS






coste unitario (coste/nº contenedores)
Área de trazado
Comparación de costes unitarios
Vagones descargados totales
coste unitario (coste/nº contenedores)
coste unitario (coste/nº contenedores)
Hoja1

Ejemplo resultados Excel Trenes 8 Reach Stackers, Modo 3 de descarga.

	A	B	C	D	E	F	G	H
1	Vagon:	Inicio:	Fin:	Descarga:	Orden:	Por:	Parámetros	
2	8	6,762916667	7,57068287	0,807766203	8	5	Total trenes:	4
3	1	6,762916667	7,76068287	0,997766203	1	3	Vagones (inc.loco) / tren	26
4	5	6,762916667	8,16068287	1,397766203	5	1	Vias utilizadas:	4
5	4	6,762916667	8,74068287	1,977766203	4	8	Num reach stackers:	8
6	11	6,762916667	8,80568287	2,042766203	11	1	Modo ejecución:	3
7	6	6,762916667	8,93068287	2,167766203	6	2		
8	7	6,762916667	9,02068287	2,257766203	7	7	Vagones descargados:	100
9	3	6,762916667	9,13568287	2,372766203	3	6		
10	13	6,762916667	9,21568287	2,452766203	13	1		
11	2	6,762916667	9,27568287	2,512766203	2	4		
12	9	6,762916667	9,38068287	2,617766203	9	5		
13	14	6,762916667	9,46068287	2,697766203	14	2		
14	15	6,762916667	9,47068287	2,707766203	15	7		
15	10	6,762916667	9,47568287	2,712766203	10	3		
16	12	6,762916667	9,55068287	2,787766203	12	8		
17	16	6,762916667	9,65068287	2,887766203	16	6		
18	17	6,762916667	9,76068287	2,997766203	17	1		
19	18	6,762916667	9,94068287	3,177766203	18	4		
20	19	6,762916667	10,08568287	3,322766203	19	5		
21	25	6,762916667	10,66068287	3,897766203	25	1		
22	101	6,762916667	10,85568287	4,092766203	101	4		
23	22	6,762916667	10,89568287	4,132766203	22	3		
24	24	6,762916667	10,97568287	4,212766203	24	6		
25	23	6,762916667	11,17068287	4,407766203	23	8		
26	102	6,762916667	11,19568287	4,432766203	102	5		
27	21	6,762916667	11,32068287	4,557766203	21	7		
28	20	6,762916667	11,41568287	4,652766203	20	2		
29	103	6,762916667	11,50568287	4,742766203	103	1		
30	104	6,762916667	11,71068287	4,947766203	104	4		
31	107	6,762916667	11,85568287	5,092766203	107	8		
32	110	6,762916667	11,92568287	5,162766203	110	2		
33	113	6,762916667	12,28068287	5,517766203	113	8		
34	108	6,762916667	12,44068287	5,677766203	108	5		
35	105	6,762916667	12,61068287	5,847766203	105	3		
36	106	6,762916667	12,75568287	5,992766203	106	6		
37	116	6,762916667	12,80068287	6,037766203	116	5		
38	111	6,762916667	13,07568287	6,312766203	111	1		

	A	B	C	D	E	F
37	116	6,762916667	12,80068287	6,037766203	116	5
38	111	6,762916667	13,07568287	6,312766203	111	1
39	117	6,762916667	13,09568287	6,332766203	117	3
40	115	6,762916667	13,25568287	6,492766203	115	8
41	114	6,762916667	13,27068287	6,507766203	114	2
42	112	6,762916667	13,33068287	6,567766203	112	4
43	109	6,762916667	13,35068287	6,587766203	109	7
44	118	6,762916667	13,40568287	6,642766203	118	6
45	119	6,762916667	13,55568287	6,792766203	119	5
46	120	6,762916667	13,74568287	6,982766203	120	1
47	121	6,762916667	13,85068287	7,087766203	121	3
48	123	6,762916667	14,05068287	7,287766203	123	2
49	124	6,762916667	14,16068287	7,397766203	124	4
50	122	6,762916667	14,25568287	7,492766203	122	8
51	125	6,762916667	14,26068287	7,497766203	125	7
52	201	6,762916667	14,84568287	8,082766203	201	6
53	202	6,762916667	15,00568287	8,242766203	202	5
54	203	6,762916667	15,19568287	8,432766203	203	1
55	204	6,762916667	15,31568287	8,552766203	204	3
56	205	6,762916667	15,53568287	8,772766203	205	2
57	206	6,762916667	15,65568287	8,892766203	206	4
58	211	6,762916667	16,33068287	9,567766203	211	1
59	210	6,762916667	16,60068287	9,837766203	210	5
60	213	6,762916667	16,84568287	10,0827662	213	2
61	212	6,762916667	17,03068287	10,2677662	212	3
62	208	6,762916667	17,12568287	10,3627662	208	7
63	214	6,762916667	17,22068287	10,4577662	214	4
64	215	6,762916667	17,29568287	10,5327662	215	1
65	217	6,762916667	17,38068287	10,6177662	217	2
66	207	6,762916667	17,38068287	10,6177662	207	8
67	216	6,762916667	17,47068287	10,7077662	216	5
68	218	6,762916667	17,56068287	10,7977662	218	3
69	209	6,762916667	17,70568287	10,9427662	209	6
70	219	6,762916667	17,78568287	11,0227662	219	7
71	220	6,762916667	17,87068287	11,1077662	220	4
72	221	6,762916667	18,08568287	11,3227662	221	1
73	222	6,762916667	18,21568287	11,4527662	222	8
74	224	6,762916667	18,24068287	11,4777662	224	2

... | DescargadoPor5ReachStackers | DescargadoPor6ReachSta

	A	B	C	D	E	F
73	222	6,762916667	18,21568287	11,4527662	222	8
74	224	6,762916667	18,24068287	11,4777662	224	2
75	223	6,762916667	18,40068287	11,6377662	223	5
76	225	6,762916667	18,48068287	11,7177662	225	3
77	301	6,762916667	18,65068287	11,8877662	301	7
78	302	6,762916667	18,78568287	12,0227662	302	4
79	303	6,762916667	18,88568287	12,1227662	303	1
80	304	6,762916667	19,03568287	12,2727662	304	8
81	306	6,762916667	19,27068287	12,5077662	306	5
82	307	6,762916667	19,40568287	12,6427662	307	3
83	310	6,762916667	19,48568287	12,7227662	310	1
84	305	6,762916667	19,53068287	12,7677662	305	2
85	308	6,762916667	19,58068287	12,8177662	308	7
86	309	6,762916667	19,62068287	12,8577662	309	4
87	311	6,762916667	19,65568287	12,8927662	311	8
88	312	6,762916667	19,72568287	12,9627662	312	5
89	313	6,762916667	19,80568287	13,0427662	313	3
90	314	6,762916667	19,96068287	13,1977662	314	1
91	315	6,762916667	20,05568287	13,2927662	315	2
92	318	6,762916667	20,38068287	13,6177662	318	4
93	317	6,762916667	20,47068287	13,7077662	317	6
94	320	6,762916667	20,54068287	13,7777662	320	5
95	319	6,762916667	20,62568287	13,8627662	319	8
96	316	6,762916667	20,68568287	13,9227662	316	7
97	321	6,762916667	20,69568287	13,9327662	321	3
98	322	6,762916667	20,90068287	14,1377662	322	1
99	323	6,762916667	21,09068287	14,3277662	323	2
100	324	6,762916667	21,33068287	14,5677662	324	4
101	325	6,762916667	21,47068287	14,7077662	325	6
102						
103						
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Este último valor de la cuarta columna será el tiempo total que se tarda en descargar la terminal por completo con nuestras especificaciones. 14,7077662 es el número que nos sale (sobre los 59 minutos posibles de simulación), a este número tendremos que aplicarle la escala que he comentado en la memoria. Esto se repite en cada caso, en cada modo de descarga y en cada combinación de Reach Stackers (descarga con 1,2,3,4,5,6,7 y 8 Reach Stackers).