

Mojo# - Lenguaje de scripting para Training Manager

Sintaxis

- **Literales:**
 - **Numéricos.** Enteros y coma flotante. Se utiliza el caracter ‘.’ para indicar la coma flotante.
 - **Booleanos.** true o false.
 - **Texto.** Cualquier texto entre comillas. (“”)
- **Operadores** (Siempre que se use una expresión, debe estar entre paréntesis)
 - Unarios
 - **Formato:** operador [literal / (expresión)]
 - **not** Niega la expresión que le sigue
 - Binarios
 - **Formato:** [literal / (expresión)] operador [literal / (expresión)]
 - **Comparadores:** ==, >=, <=, >, <
 - **Matemáticos:** +, -, *, /
 - **Lógicos:** and, or
- **Variables**
 - **Definición**
var [nombredevariable]. (El punto al final es obligatorio)
 - **Acceso**
[nombredevariable].get
 - **Asignación**
[nombredevariable] = [literal / (expresión)]
- **Control de Flujo**
 - **If:** Salto condicional
if (literal / expresión) Cualquier número de expresiones **endif**
- **Métodos Definidos**
 - Permite ejecutar métodos definidos en unas clases especiales.
 - **Formato:** NombredeClase.NombreDeMetodo(parametros)

API

•Asset

- void **Asset.Enable(string assetName, bool enable)** : Set Asset to ‘enable’ status

•Breakdown

- void **Breakdown.Break(string breakdownId)** : Breaks something on the vehicle. Values:
WheelMisalignment - Puncture - SuspensionFailure - NoFuel- Overheating -
BrakeFailure - LightsFailure - GlassBroken - LeftMirrorBroken- RightMirrorBroken -
ClutchBroken - EngineFailure - SteeringBroken - FifthWheelBroken- DoorBroken -
DiryGlass - AbsBroken - AsrBroken - EspBroken - FrontBrakeFailure- RearBrakeFailure
- SnowPlowHydraulicFailure - TransmissionBroken - BlowoutLeftTire

- void **Breakdown.Repair(string breakdownId)** : Repairs something on the vehicle.
Values: Same as previous method.
- void **Breakdown.BreakAll()** : Fix the whole vehicle
- void **Breakdown.FixAll()** : Fix the whole vehicle

•Bus

- void **Bus.ResetAll()** : Resets all Passengers
- void **Bus.StopRequest(string passengerType)** : Ask for an stop from inside the bus.
Values: COMMON - HANDICAPPED
- void **Bus.UploadRequest(string passengerType)** : Ask for an stop from outside the bus.
Values: COMMON - HANDICAPPED

•Driver

- void **Driver.SetBreathalyzerLevel(string breathalyzerLevel)** : Set the selected Weather. *Values: NONE - LOW - MEDIUM - HIGH*
- void **Driver.SetTirednessLevel(string tirednessLevel)** : Set the selected Weather.
Values: NONE - MEDIUM - HIGH

•Environment

- void **Environment.ChangeWeather(string selectedWeather)** : Set the selected Weather. *Values: SUNNY - CLOUDY - RAINY - ICY - HAIL - SNOW*
- void **Environment.ChangeDayTime(string selectedDayTime)** : Set the selected Weather. *Values: DAY - DUSK - NIGHT - DAWN .*
- void **Environment.SetIntensity(string selectedIntensity)** : Set the selected Intensity.
Values: NONE - LOW - MODERATE - HIGH
- void **Environment.ModifyAsphalt(string selectedAsphalt)** : Set the selected Asphalt Modifier. *Values: AQUAPLANING - OIL - DEGRADED ASPHALT*
- void **Environment.ChangeWindDirection(string direction)** : Set the selected Wind Direction. *Values: NORTH, SOUTH, EAST, WEST*
- void **Environment.ChangeWindIntensity(string intensity)** : Set the selected Wind Intensity. *Values: NONE - LOW - MODERATE – HIGH*

•Exercise

- void **Exercise.Reboot()** : Reboot the scripts of the exercise.

•HelpScreens

- void **HelpScreens.PlayVideo**(string name, number xPos, number yPos, number width, number height) : *Play the exercise's video.*
- void **HelpScreens.StopVideo**() : *Hide the Video*
- void **HelpScreens.ShowResults**(number xPos, number yPos, number width, number height) : *Show the Results Window*
- void **HelpScreens.AddResult**(string row name, number value) : *Add a row to the results window*
- void **HelpScreens.HideResults**() : *Hide the Results Window*

•Infractions

- void **Infractions.StartChecking**(string infractionId) : *Starts checking an infraction.*
Possible Values: WrongGearShift, SecurityBelt, Stalled, Wiper, HandBrake, SkipBusStop, BusPark, OpenDoor, Clutch, Collision, TrafficVehicleCollision, AnimalCollision, PedestrianCollision, BikeCollision, DrivingLaneReserved, DrivingInOppositeDirection, BadRetarder, OpenTrailer, BusBadPosition, FifthWheelError, BreakDown, PourSnowDown, DrivingOnSnowWithoutShovel, LaneChange, HittingExpansionJoints, RemoveSnowWithoutEmergencyLights, SpreadSaltWithoutEmergencyLights, ExcessSpeedRemovingSnowToPlow, PourSnowToAdjacentLanes, PourSnowOnVehicles, FreeAcceleration, GearShiftAcceleration, IgnitionWithKickstand, DrivingWithoutSnowWithShovel, PriorityNoRespectedInPedestrianCrossing, PriorityNoRespected, SpeedLimit, TooSlow, Offroad, ConeCollision, LightsInfractionBadSituation, LightsInfractionMandatorySituation, ExcessSpeedRemovingSnowToWedge, RotaryLights, Traction, TransferBox, Differential, Chains, Inclination, RespectCyclist, CollisionWithTrain, DistanceExceededAtBusStop, AggressiveDriving, UnboardHandicappedNotDone, BoardHandicappedNotDone, UnboardPassengersNotDone, BoardPassengersNotDone, ToRunARedLight, InstructorCollision, ToRunAStop, ObstructionToEmergencyVehicles, SettedSpeedLimit, NeutralGearDriving, OperatorsSecurityDistance, Overturn, WrongApproachToCrusher, UnloadWhileMoving, OperatorCollision, DumperBucketCollision, PowerLineCollisionInfraction, NotUseRetarderDownhill, DrivingWithBucketRaised, ParkWithBucketRaised, ToRunAStopWithTrigger, UnloadInWrongPlace, DrivingWithForkRaised, DamagedFurniture, DamagedLoad, WrongGearShiftMX, ToRunARailway, StoppedInRailway, ParkedInRailway

- void **Infractions.StopChecking(string infractionId)** : *Stops checking an infraction. Possible Values: Same as previous method.*
- bool **Infractions.HasBeenCommitted(string infractionId)** : *Stops checking an infraction. Possible Values: Same as previous method.*

•Input

- void **Input.WaitAction(string action)** : *Wait until action input is pressed. Possible values: Continue.*

•Locution

- void **Locution.Play(string locutionToPlay, bool wait)** : *Play the selected locution. If there's any locution playing, it will stop.*
- void **Locution.PlayOneShot(string locutionToPlay, bool wait)** : *Play the selected locution just once. To play it again you have to do a Locution.Restart(). If there's any locution playing, it will stop.*
- void **Locution.Restart()** : *Allow to play again any locution*
- void **Locution.Stop()** : *Stop the selected locution*

•Logger

- void **Logger.Log(string message)** : *Log String to Console*
- void **Logger.ShowMessage(string message)** : *Show message in the indications window*
- void **Logger.HideMessage()**: *(Hide current message in the indications window)*

•Objective

- void **Objective.Increase(string objectiveId)** : *Increase the Objective punctuation by one*
- void **Objective.Decrease(string objectiveId)** : *Decrease the Objective punctuation by one*

•Operations

- Vector3 **Operations.Distance(string point1, string point2)** : *Distance between two points*
- float **Operations.Clamp(number value, number min, number max)** : *the float result between the min and max values*
- string **Operations.Concatenate(string string1, string string2)** : *Adds two strings*

•Timer

- void **Timer.WaitSeconds(float seconds)** : *Wait until continue execution*
- void **Timer.FinishExercise()** : *Closes current exercise*
- float **Timer.Timestamp()** : *Returns float timestamp in milliseconds*

•Traffic

- void **Traffic.ChangeIntensity(string selectedIntensity)** : *Set the Traffic Intensity.*
Values: NONE - LOW - MODERATE - HIGH
- void **Traffic.Cross(string selectedEntity, string selectedDifficulty)** : *Makes an entity cross in front of User Vehicle. Values for Entity: PEDESTRIAN - ANIMAL - BICYCLE - TORNADO - DOG - HORSE - COW - PIG Values for Difficulty: EASY - MEDIUM - HARD*
- void **Traffic.Accident(string selectedDifficulty)** : *Spawn an Accident in front of User Vehicle, Values: EASY - MEDIUM - HARD*
- void **Traffic.BrokenCar(string selectedDifficulty)** : *Spawn a Broken Car in front of User Vehicle, Values: EASY - MEDIUM - HARD*
- void **Traffic.Ambulance(string selectedDifficulty)** : *Spawn an Ambulance in front of User Vehicle, Values: EASY - MEDIUM - HARD*
- void **Traffic.StartTrafficRoute(string routeName)** : *Starts Traffic Route*
- void **Traffic.StopTrafficRoute(string routeName)** : *Stop Traffic Route*
- void **Traffic.TrafficJam()** : *Spawn a traffic jam in front of User Vehicle*
- void **Traffic.ClearTrafficEntities()** : *Clear all spawned traffic entities*

•Trigger

void **Trigger.Enable(string triggerName, bool enable)** : *Set Trigger to enable status*

•UserVehicle

- object **UserVehicle.GetValue(string id)** : *Returns the desired value from Vehicle.*
Possible Values: RPM, Gear, Velocity, FuelConsumption, AverageFuelConsumption, AccumulatedConsumption, Emissions, MeanEmissions, AccumulateEmissions, DistanceTraveled, HandBrake, Retarder, ClutchPedal, GasPedal, BrakePedal, Belt, PositionLights, BeamLights, FullBeamLights, FrontFogLights, RearFogLights, LeftBlinkerLights, RightBlinkerLights, WarningLights, Wipers, FrontBrake, RearBrake, UserPosition

- void **UserVehicle.Respawn(string spawnPointName)** : *Respawns the vehicle on the selected SpawnPoint*
- void **UserVehicle.Enable(bool isEnabled)** : *Enable or disable vehicle controls*
- void **UserVehicle.ChangeLoadLevel(float loadLevel)** : *Sets the load level. Values: 0 - 0.25 - 0.50 - 0.75 - 1*

Recomendaciones y advertencias

- Al hacer una comparación de una variable con un literal, poner el literal en la parte izquierda de la comparación.
- Las expresiones deben escribirse entre paréntesis, ya sea en una asignación de una variable, en la parte izquierda o derecha de un operador, como condición de un if, etc. Ej:

```
var x.
```

```
x = 5
```

```
x = UserVehicle.GetValue("RPM")
```

```
x = (x.get + 1)
```

```
if ( 1 > UserVehicle.GetValue("Velocity") )
```

```
    Locution.Play("Stopped", true)
```

```
endif
```

```
if ( ( 50 + 30 ) < UserVehicle.GetValue("Velocity") )
```

```
    Locution.Play("Too fast", true)
```

```
endif
```

- Para lanzar una ruta, no basta con crearla en el editor, hay que darle un nombre y lanzarla desde Mojo# con la instrucción `Traffic.StartTrafficRoute("nombreDeRuta")`.
- No se permite el uso de if anidados.
- Si se va a usar el método `OnStay` de un trigger, no es recomendable (aunque se permite) utilizar los métodos `OnStart` y `OnExit` del mismo trigger para evitar conflictos en el orden de ejecución de las instrucciones.
- El método `UserVehicle.GetValue("Velocity")` devolverá un valor negativo en caso de que el vehículo vaya marcha atrás.
- El método `Exercise.Reboot()` vuelve a ejecutar el ejercicio desde el principio, pero sólo en lo que a los scripts se refiere. Si por ejemplo queremos que el vehículo vuelva a estar en su posición inicial, tendríamos que hacer un `Respawn` a esa posición en el script `OnStart`.

- El método `Input.WaitAction("Continue")` se utiliza para que la ejecución de los scripts se detenga hasta que pulsemos la tecla Enter. De momento no admite más valores.
- Los ejercicios de Training Manager deben estar en la misma carpeta en la que se guardan por defecto (`Application/Simescar_Data/StreamingAssets/TrainingManager`). Si cargamos un ejercicio que no está en ese directorio, ocurrirá lo siguiente:
 - En el Editor TM:
 - No se cargarán los scripts. Cualquier método (`OnHit`, `OnStay`, `OnEnter`, etc.) aparecerá vacío.
 - Si le damos a Guardar, **todos los scripts se borrarán**, ya que el ejercicio se guarda con su estado actual, es decir, con los scripts vacíos.
 - Cargando del ejercicio en simulación:
 - El ejercicio carga, con los objetos que hayamos puesto, pero los scripts tampoco se cargan, por lo que nada de lo programado en Mojo# funciona.