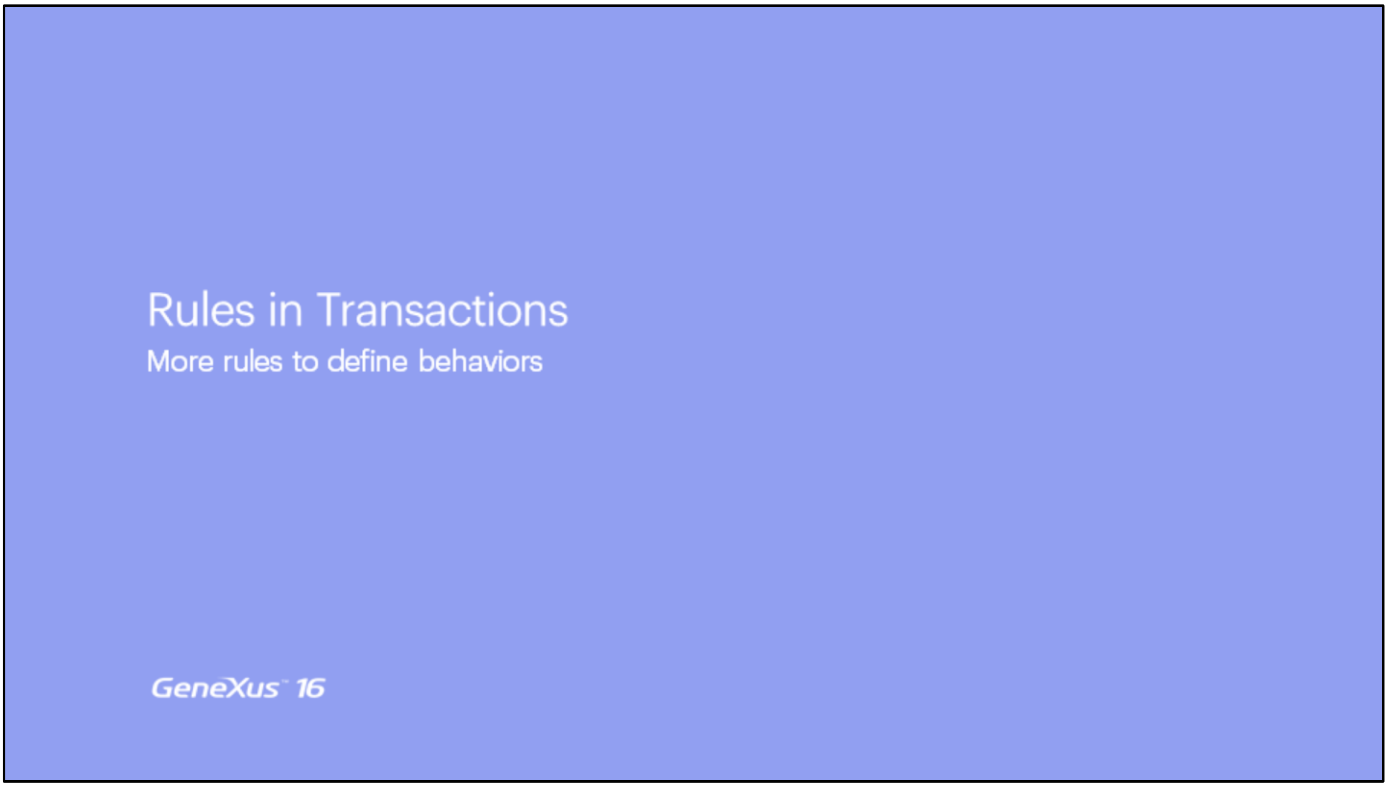


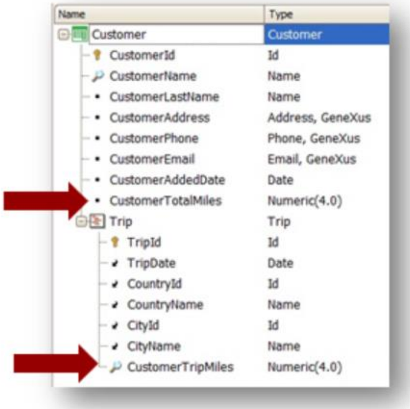
Rules in Transactions

More rules to define behaviors

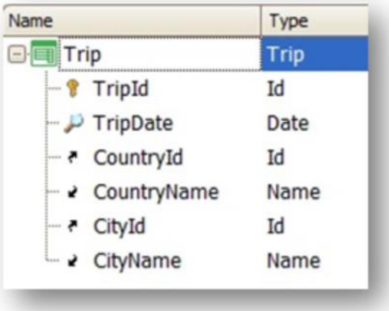
GeneXus 16

Scenario

Customers accrue miles with every trip they make



Name	Type
Customer	Customer
CustomerId	Id
CustomerName	Name
CustomerLastName	Name
CustomerAddress	Address, GeneXus
CustomerPhone	Phone, GeneXus
CustomerEmail	Email, GeneXus
CustomerAddedDate	Date
CustomerTotalMiles	Numeric(4.0)
Trip	Trip
TripId	Id
TripDate	Date
CountryId	Id
CountryName	Name
CityId	Id
CityName	Name
CustomerTripMiles	Numeric(4.0)



Name	Type
Trip	Trip
TripId	Id
TripDate	Date
CountryId	Id
CountryName	Name
CityId	Id
CityName	Name

Rule:
Add(CustomerTripMiles,CustomerTotalMiles);

How does the Add rule work?

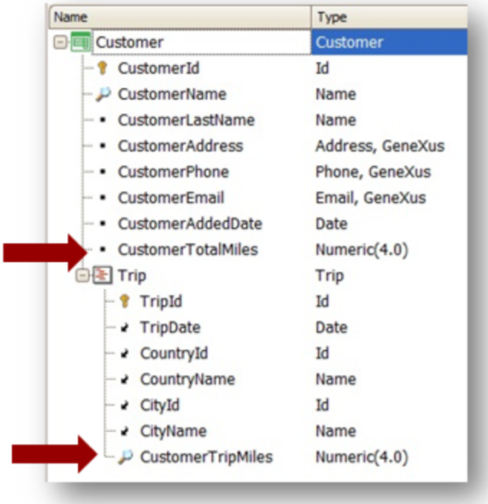
Suppose that a customer makes several trips and accrues miles.

To implement the customer's mileage accrual, in the Customer transaction we define the following rule:

Add(CustomerTripMiles, CustomerTotalMiles);

How does this rule behave?

Add Rule Behavior



Name	Type
Customer	Customer
CustomerId	Id
CustomerName	Name
CustomerLastName	Name
CustomerAddress	Address, GeneXus
CustomerPhone	Phone, GeneXus
CustomerEmail	Email, GeneXus
CustomerAddedDate	Date
CustomerTotalMiles	Numeric(4.0)
Trip	Trip
TripId	Id
TripDate	Date
CountryId	Id
CountryName	Name
CityId	Id
CityName	Name
CustomerTripMiles	Numeric(4.0)

- If a new trip is entered for the Customer:

Add(CustomerTripMiles,CustomerTotalMiles);

- If a trip is deleted for the Customer:

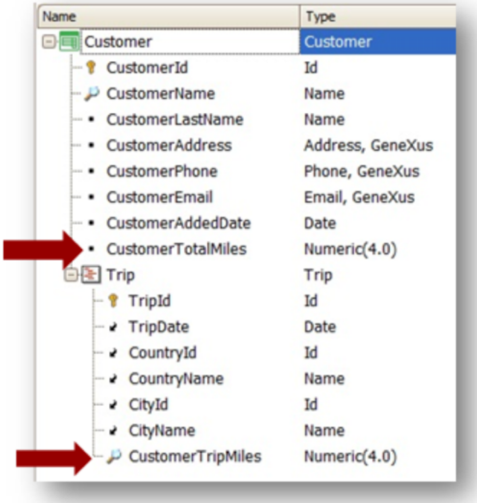
Add(CustomerTripMiles,CustomerTotalMiles);

The behavior of the Add rule varies, depending on the operation being performed:

• If a new trip is added for the customer, the value of CustomerTripMiles is added to CustomerTotalMiles.

• If a trip is deleted from the customer, the value of CustomerTripMiles is automatically subtracted from CustomerTotalMiles.

Add Rule Behavior



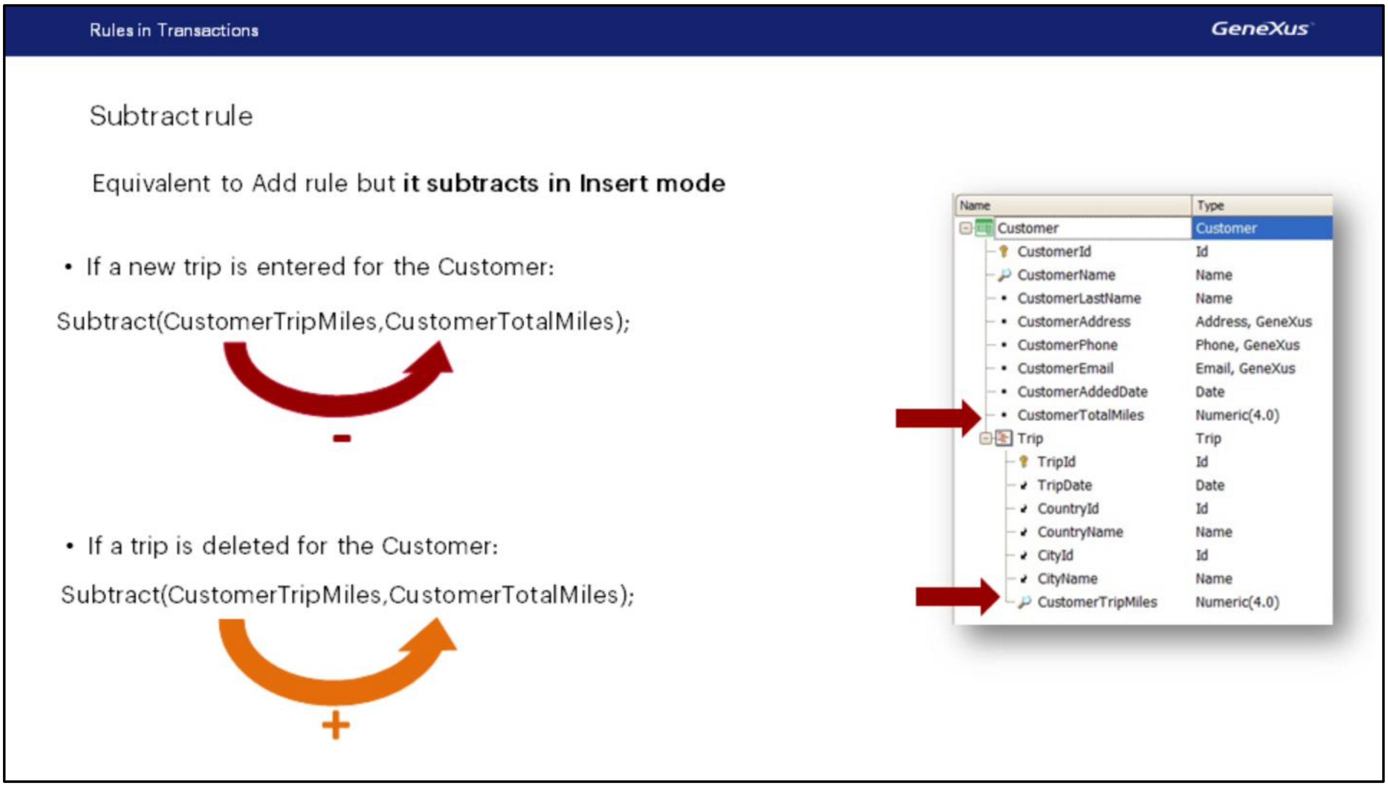
Name	Type
Customer	Customer
CustomerId	Id
CustomerName	Name
CustomerLastName	Name
CustomerAddress	Address, GeneXus
CustomerPhone	Phone, GeneXus
CustomerEmail	Email, GeneXus
CustomerAddedDate	Date
CustomerTotalMiles	Numeric(4.0)
Trip	Trip
TripId	Id
TripDate	Date
CountryId	Id
CountryName	Name
CityId	Id
CityName	Name
CustomerTripMiles	Numeric(4.0)

- If a trip is changed for a Customer:

Add(CustomerTripMiles,CustomerTotalMiles);

The previous value of CustomerTripMiles is subtracted from CustomerTotalMiles and the new value is added.

If the value of CustomerTripMiles associated with a customer’s trip is changed, its configured value is automatically subtracted and the new value is added to the customer’s total miles.



Rules in Transactions

GeneXus

Subtract rule

Equivalent to Add rule but **it subtracts in Insert mode**

- If a new trip is entered for the Customer:

Subtract(CustomerTripMiles,CustomerTotalMiles);

- If a trip is deleted for the Customer:

Subtract(CustomerTripMiles,CustomerTotalMiles);

Name	Type
Customer	Customer
CustomerId	Id
CustomerName	Name
CustomerLastName	Name
CustomerAddress	Address, GeneXus
CustomerPhone	Phone, GeneXus
CustomerEmail	Email, GeneXus
CustomerAddedDate	Date
CustomerTotalMiles	Numeric(4.0)
Trip	Trip
TripId	Id
TripDate	Date
CountryId	Id
CountryName	Name
CityId	Id
CityName	Name
CustomerTripMiles	Numeric(4.0)

The Subtract rule has a similar behavior to that of the Add rule, but it **subtracts the first value from the second one** if a trip is added.

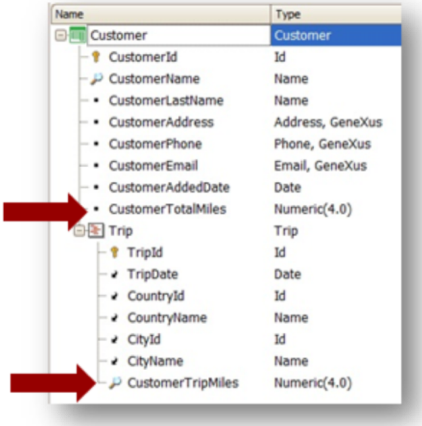
Let’s consider the following Subtract rule:

Subtract(CustomerTripMiles, CustomerTotalMiles);

- If a new trip is added for the customer, the value of CustomerTripMiles is subtracted from CustomerTotalMiles.
- If a trip is deleted for the customer, the value of CustomerTripMiles is automatically added to CustomerTotalMiles.

Subtract rule

Equivalent to Add rule but it **subtracts in Insert mode**



Name	Type
Customer	Customer
CustomerId	Id
CustomerName	Name
CustomerLastName	Name
CustomerAddress	Address, GeneXus
CustomerPhone	Phone, GeneXus
CustomerEmail	Email, GeneXus
CustomerAddedDate	Date
CustomerTotalMiles	Numeric(4.0)
Trip	Trip
TripId	Id
TripDate	Date
CountryId	Id
CountryName	Name
CityId	Id
CityName	Name
CustomerTripMiles	Numeric(4.0)

- If a trip is changed for the Customer

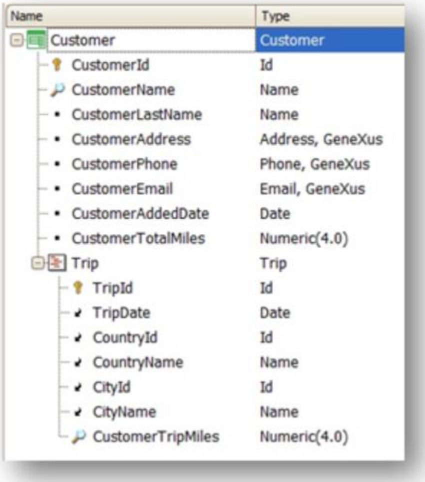
```
Subtract(CustomerTripMiles,CustomerTotalMiles);
```

Adds to CustomerTotalMiles the previous value of CustomerTripMiles and subtracts the new value

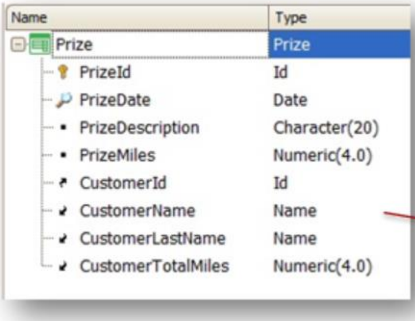
- If the value of CustomerTripMiles associated with one of the customer’s trips is changed, its configured value is automatically added and the new value indicated is subtracted.

Combining rules...

Customers can trade their accrued miles for a reward if they have enough miles.



Name	Type
Customer	Customer
CustomerId	Id
CustomerName	Name
CustomerLastName	Name
CustomerAddress	Address, GeneXus
CustomerPhone	Phone, GeneXus
CustomerEmail	Email, GeneXus
CustomerAddedDate	Date
CustomerTotalMiles	Numeric(4.0)
Trip	Trip
TripId	Id
TripDate	Date
CountryId	Id
CountryName	Name
CityId	Id
CityName	Name
CustomerTripMiles	Numeric(4.0)



Name	Type
Prize	Prize
PrizeId	Id
PrizeDate	Date
PrizeDescription	Character(20)
PrizeMiles	Numeric(4.0)
CustomerId	Id
CustomerName	Name
CustomerLastName	Name
CustomerTotalMiles	Numeric(4.0)

```
Error("The customer doesn't have enough miles") if
CustomerTotalMiles < 0;

Subtract(PrizeMiles, CustomerTotalMiles);
```

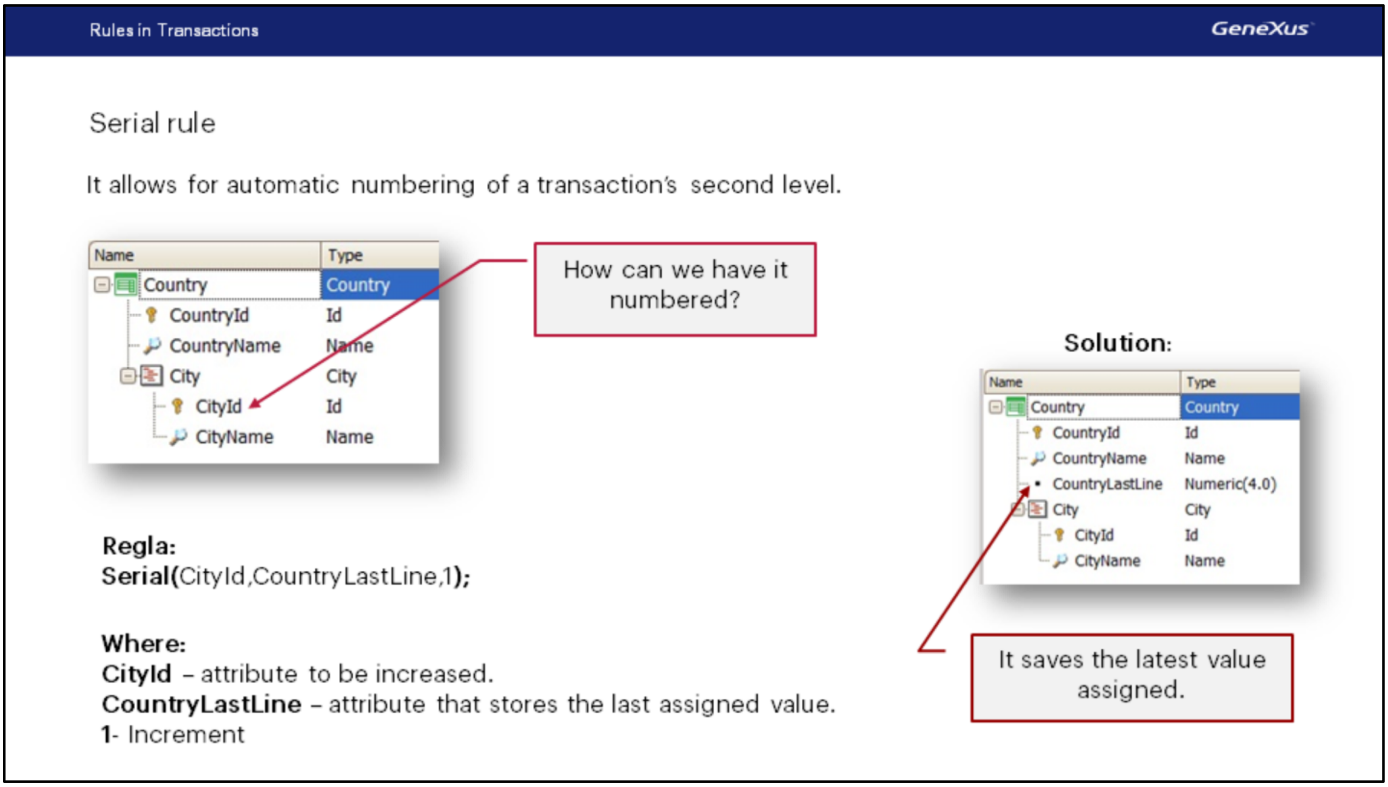
We have the Prize transaction, which allows defining rewards to be traded for miles.
Each reward requires a number of miles in order to be assigned to a customer who has accrued that number of miles (or who has an even larger number of miles).
Therefore, when trying to assign 1 customer to 1 reward, we must check if the customer has enough miles to be assigned this reward. If he/she has enough miles and accepts the reward, we must subtract the miles he traded. If the customer doesn't have enough miles, we need to show the corresponding error message.

Note the 2 rules defined for the Prize transaction. Since both involve the CustomerTotalMiles attribute, and one of the rules updates the attribute and the other one assesses its value, GeneXus determines that first it must make the subtraction that updates the CustomerTotalMiles attribute and then evaluate what happened with its value.

Because the subtraction is made first, if the customer has fewer miles than those required by the reward, the CustomerTotalMiles attributes will have a negative value. For this reason, the Error rule evaluates if CustomerTotalMiles<0. If this happens, the Error rule is triggered, an error message is displayed and the subtract rule is undone; that is to say, its execution is reverted as if nothing was done and the customer's total number of miles is not modified.

If CustomerTotalMiles doesn't have a negative value (CustomerTotalMiles<0) after making the subtraction, it means that the subtract operation has been performed.

Note that if the record of a reward assigned to the customer is deleted, the subtract rule adds instead of subtracting. That is to say, to the total number of miles accrued by the customer (CustomerTotalMiles) it adds the number of miles corresponding to the reward (PrizeMiles).



Serial rule

It allows for automatic numbering of a transaction's second level.

Name	Type
Country	Country
CountryId	Id
CountryName	Name
City	City
CityId	Id
CityName	Name

How can we have it numbered?

Solution:

Name	Type
Country	Country
CountryId	Id
CountryName	Name
CountryLastLine	Numeric(4.0)
City	City
CityId	Id
CityName	Name

It saves the latest value assigned.

Regla:
Serial(CityId,CountryLastLine,1**);**

Where:
CityId – attribute to be increased.
CountryLastLine – attribute that stores the last assigned value.
1- Increment

Lastly, let's see how we can number the second level of a transaction.

Since the Autonumber property can only be applied to single primary keys, to automatically number a second level we can use the **Serial** rule.

This rule requires defining an attribute in the 1st level of the transaction, which will save the last value assigned to the lines of the second level.

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