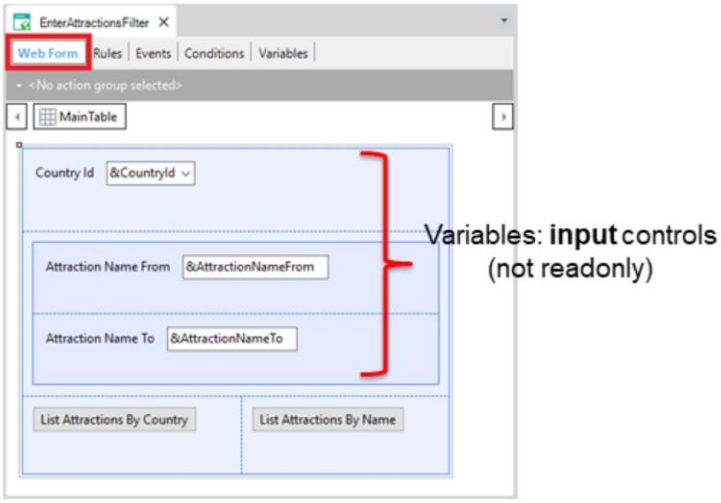
Interactive Screens
Web Panel Object (Continued)

GeneXus 16

Web Panel Object

- Implements a highly flexible web screen
- Example:

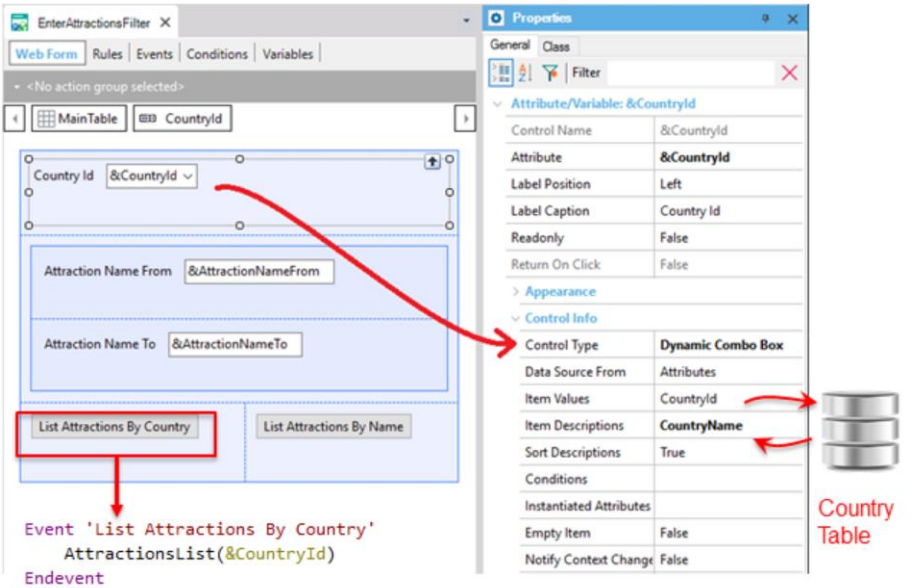


Web panels are the most versatile objects provided by GeneXus.

As we've seen in some examples, all web panels have a web form consisting of a web page that enables us to design and provide a variety of functionalities.

In the example we saw that the variables that we include in the web form are enabled for the user to assign values to them. This means that they are input controls; in other words, they are not read-only.

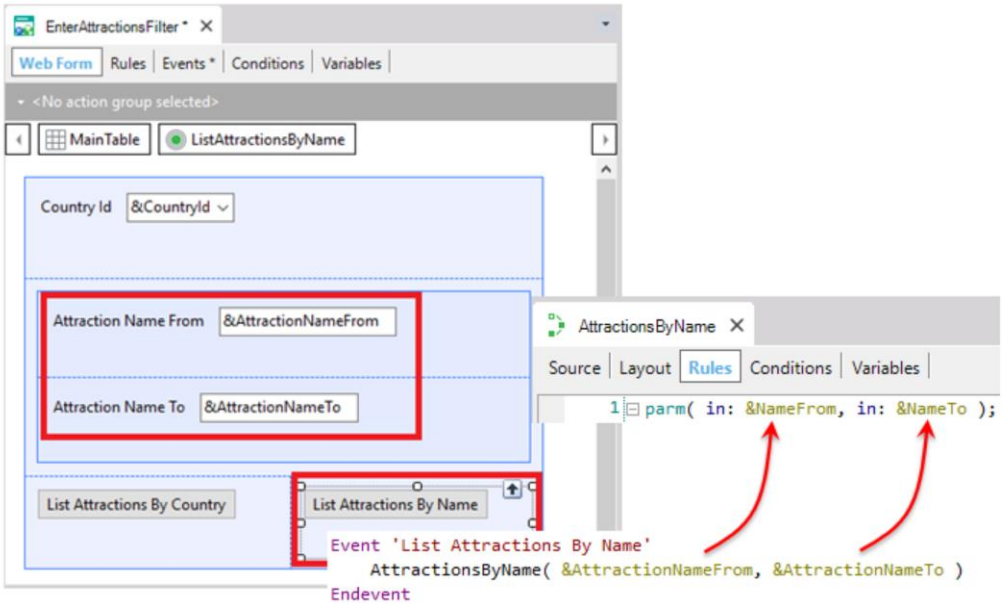
Example: variables in Web panel



Specifically, this variable, of the dynamic combo type, expected the user to select one country from those loaded in the combo. After pressing the button “List Attractions By Country”, the associated event would be executed invoking the PDF file containing a list of attractions in that country.

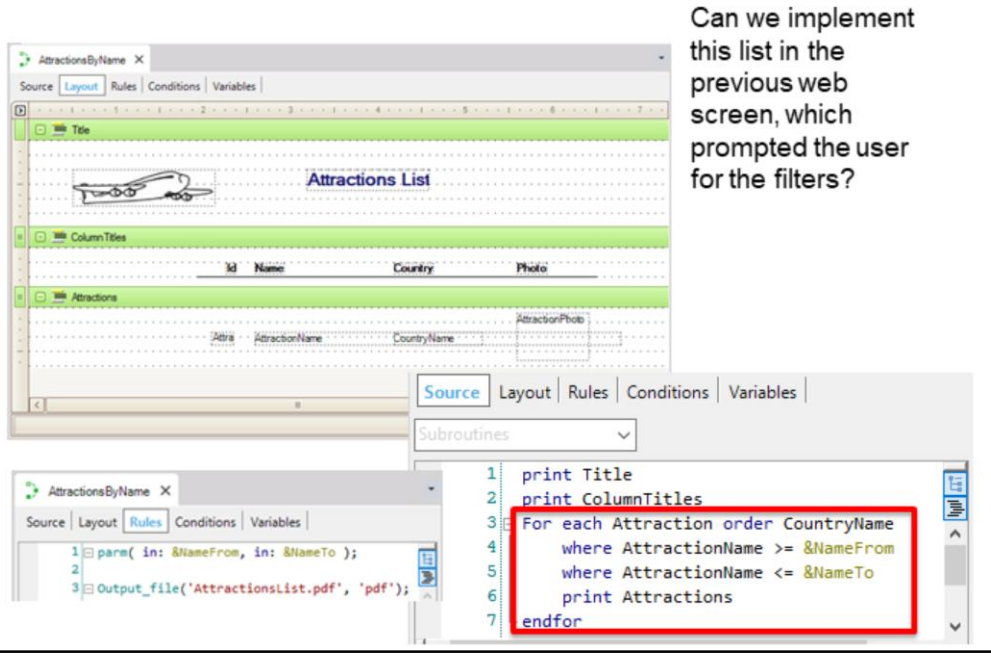
Here, the database is accessed only to load the combo’s values.

Example: variables in Web panel



In these other variables, the user would enter a range of attraction names so that when this other button is pressed the PDF list showing the attractions within the range received by parameter would be invoked.

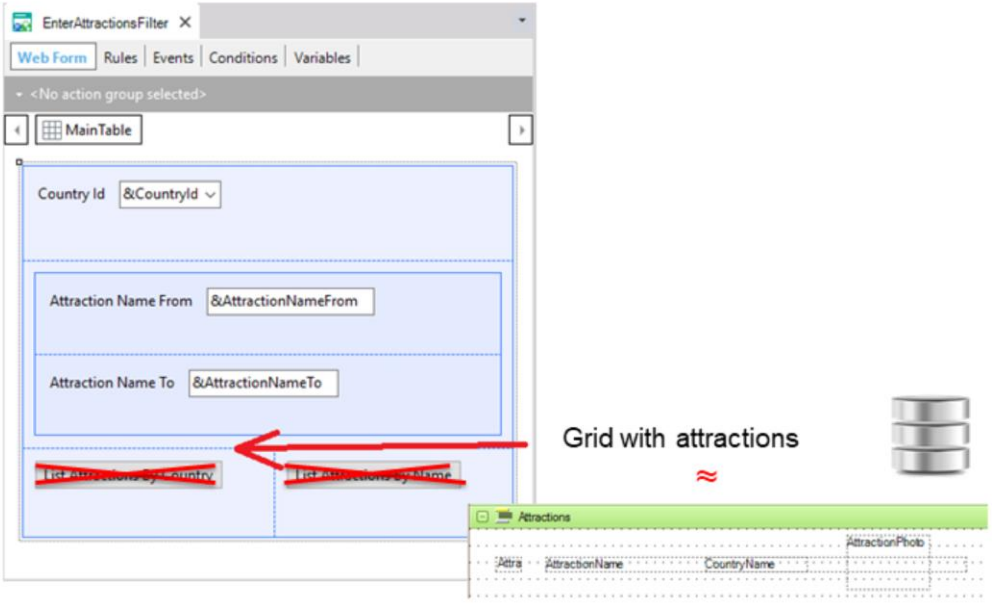
Example:



Remember the layout. In the Source, we programmed the database query with the For Each, filtering by name.

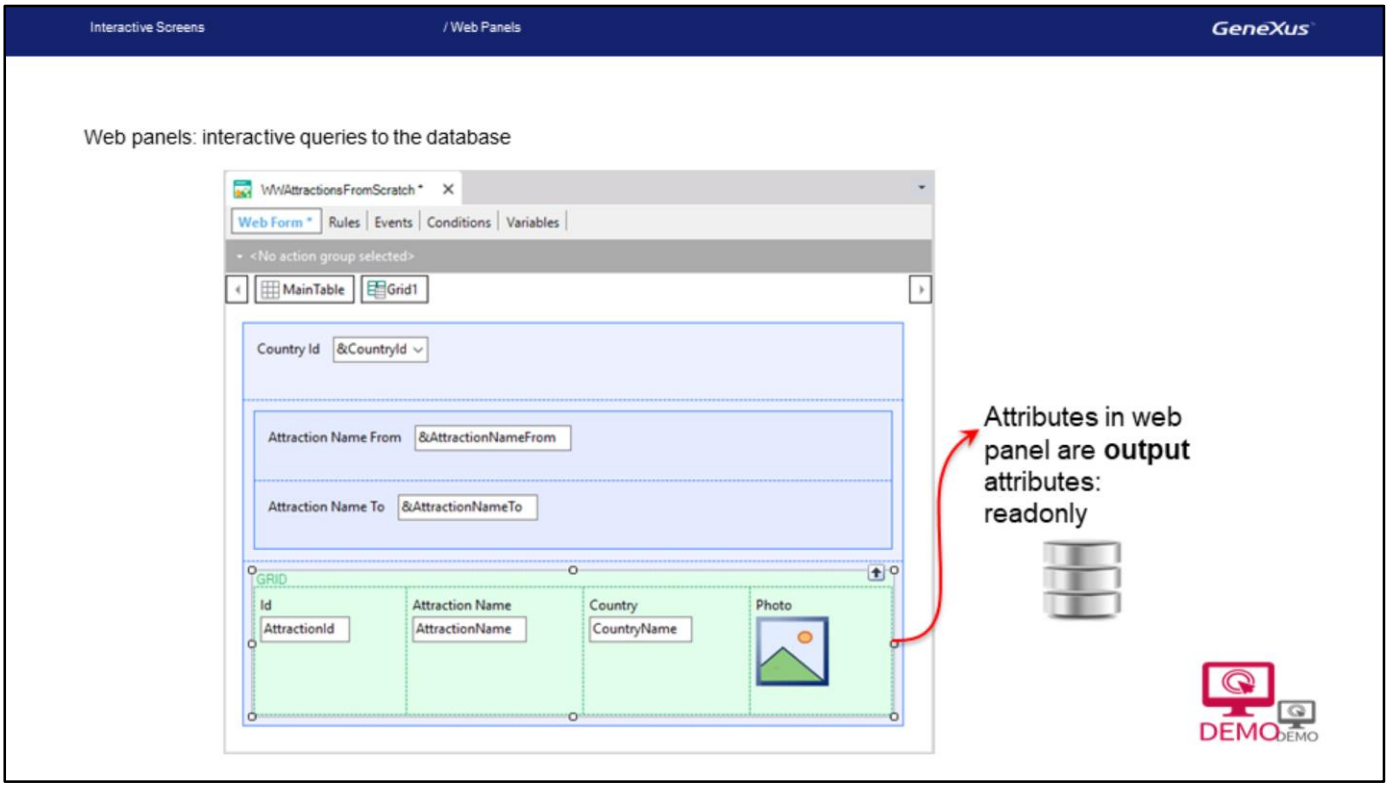
But, why do we define these queries through PDF listings instead of doing it directly on the screen where the user is required to enter data for the filters?

Let's change the web panel so that it can query the DB



Why not add here a grid showing the desired attractions instead of the buttons?

The rows of the grid will be similar to the printblock that shows each attraction.



Apart from allowing the definition of variables to be used in actions programmed in buttons, web panels allow us to implement **interactive** queries to the database, which is in fact their main purpose.

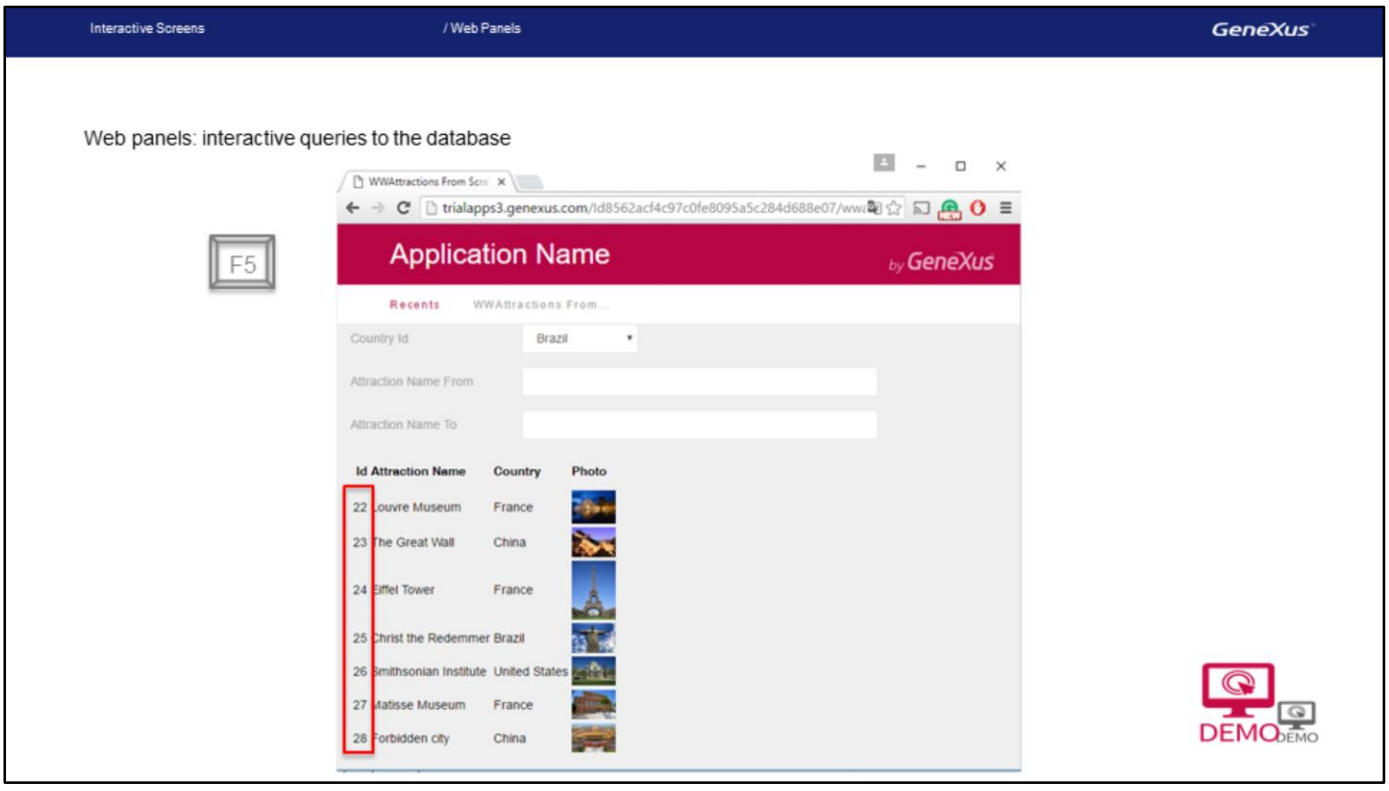
"**Interactive"** implies that it is possible for the user to enter many different values – **in variables** – in the web page and then query the database for data matching the values entered, using them as filters, as we will see next.

Let's now save this web panel with a different name. We will be implementing something similar to a Work With element, so we will call it WWAttractionsFromScratch.

We remove the buttons and the associated events because they will no longer be necessary. Now, we insert a control of the grid type below the variables.

A screen opens up in order to select the attributes and/or variables that will be this grid's columns. Since we want to show the same we showed on the PDF listings, we select the AttractionId, AttractionName, AttractionPhoto and CountryName attributes
and then press OK. We will then see that a grid has been created with these columns. We may change the column titles by editing the properties of each attribute comprised in the grid columns.

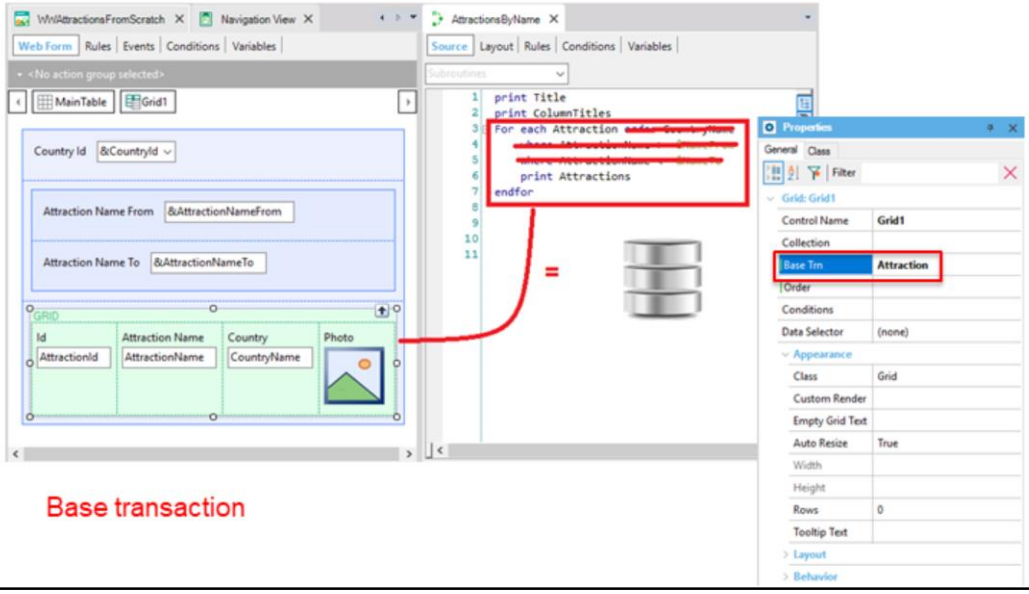
The **attributes** in a web panel form are, by default, **output** attributes. That is to say that they are **readonly**. This means that GeneXus understands that it must go to the database to search for their value and show it to the user.



Let's press F5 to run our new web panel, just as we have it so far.

We can see that all the attractions have been printed, with the data we indicated (ID, name, country and photo). We will also see that they have been ordered by AttractionId.

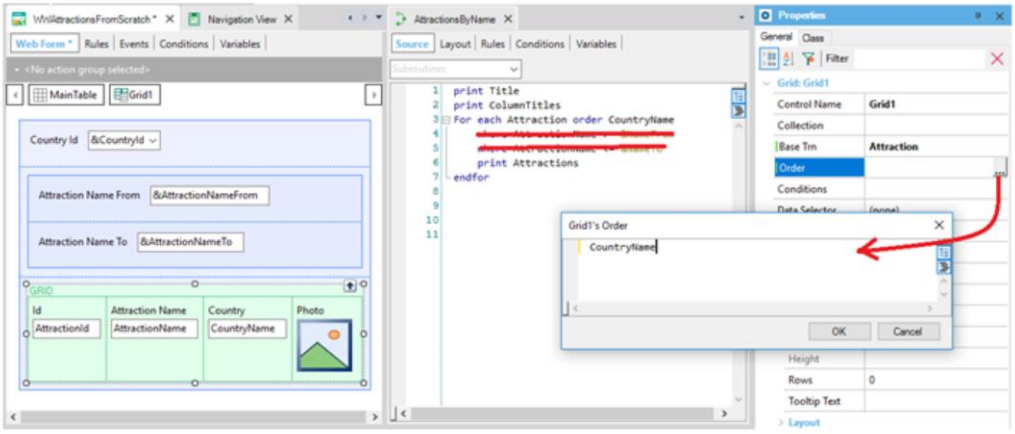
Grid with attributes is the equivalent to a For each command



The mere grid with these attributes drove GeneXus to understand that it should go to the database to navigate the Attraction table, and then access Country to bring the country of the attraction, as we did with the For Each command (without the order and where clauses).

We can see that one of the grid properties is called **Base Trn.** This property is similar to the base transaction of the For Each command. In fact, to make sure that the Attraction base table is selected for the grid, as we want, we should indicate the base transaction, just like for the For Each command.

Grid with attributes is the equivalent to a For each command

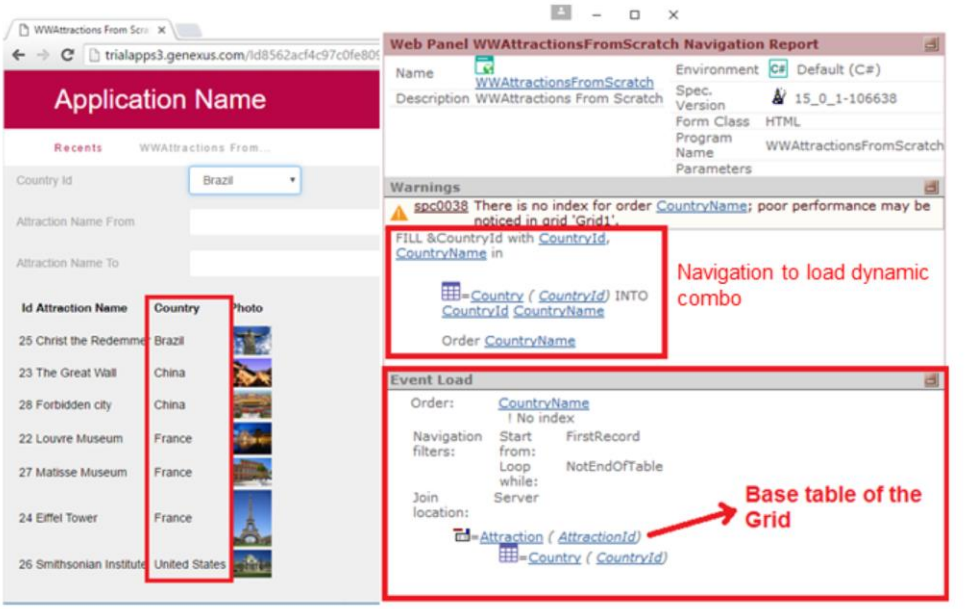


Order

In addition, note that an **Order** property is available for the grid. This property corresponds to the Order clause of the For Each command.

So, if we want to order by country name, as in the listing, in the Order property we have to write the CountryName attribute.

Grid with attributes is the equivalent to a For each command

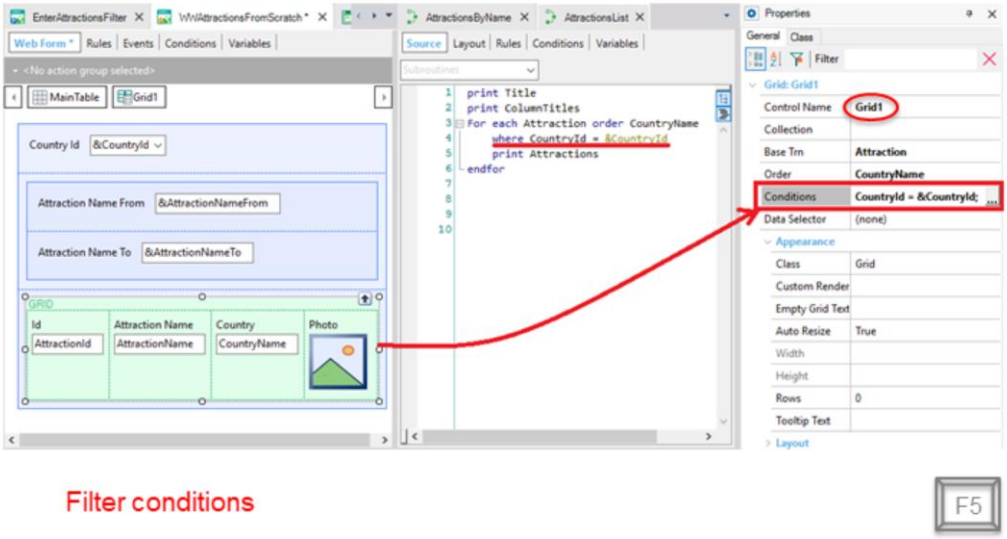


We press F5, and we will see that the grid is now ordered by country name.

Note that the navigation list of the web panel here indicates the navigation that has to be made to load the combo box of the &CountryId variable, which we have not used at all for the time being.

And, here, it indicates the navigation that will have to be made to load the grid. The list for this loading is identical to the list for a For Each command. It has selected the Attraction table, running it through CountryName - the attribute of the Order property. It will run through the entire table, and for each record in Attraction to be loaded, it will access the Country table to show the CountryName for the attraction.

Filter grid data



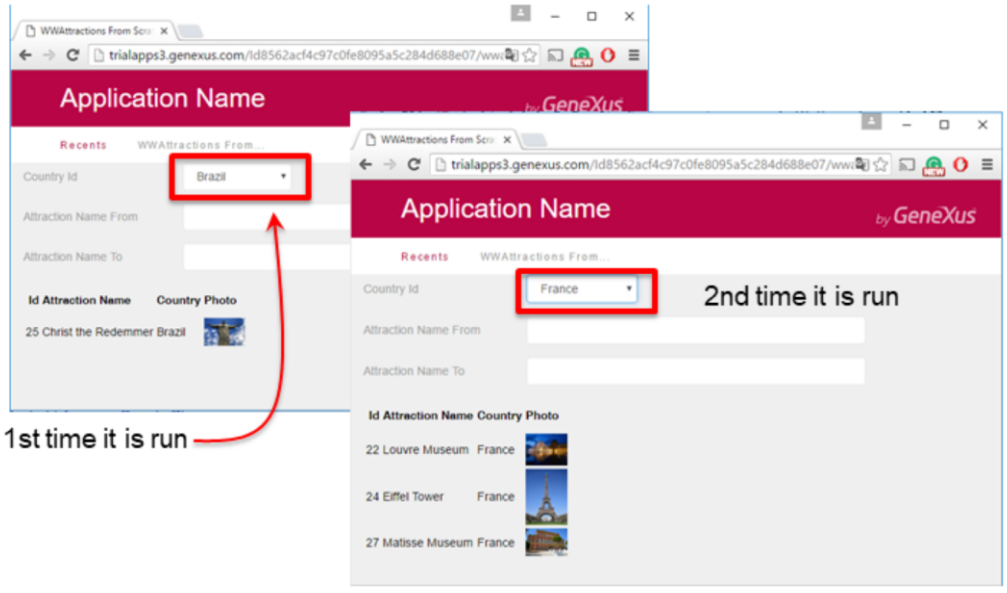
Filter conditions

F5

So far, we haven't done anything with variables. But we wanted to use them to filter the data displayed in the grid, by country and as well as by attraction name.

In AttractoinsList we filtered by country. How do we indicate this filter for the grid? Through the **Conditions** property.

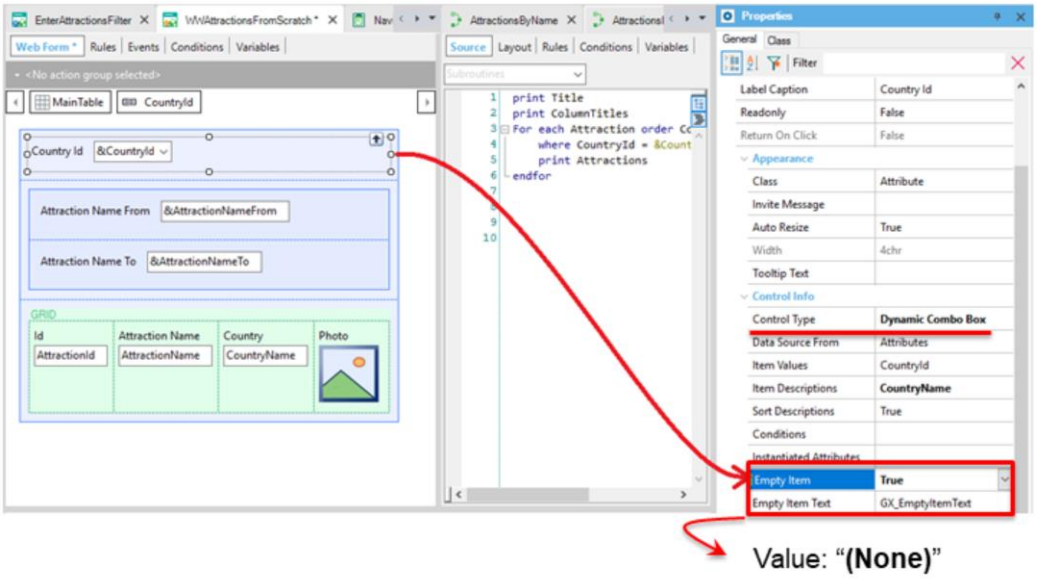
Filter grid data



Note that, by default, the combo box takes the value Brazil, and that the grid only shows an attraction in Brazil.

If we select France, we see that the screen is refreshed and the grid is loaded again, this time with the attractions in France.

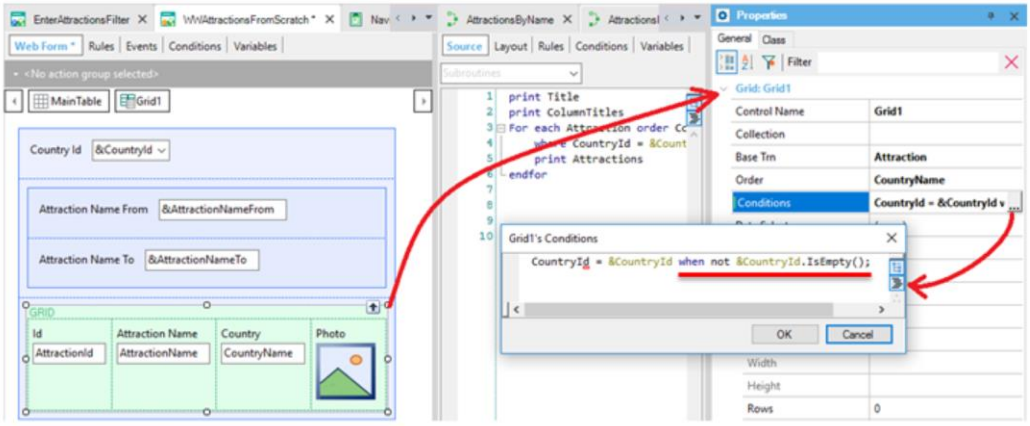
Conditional filtering of grid data



We will probably want the combo to be first displayed without a selected value, with the attractions of all countries displayed.

To do this we must edit the combo box properties... and set the Empty Item property to True. This will add a "(none)" option to the combo. It will correspond to an empty value.

Conditional filtering of grid data

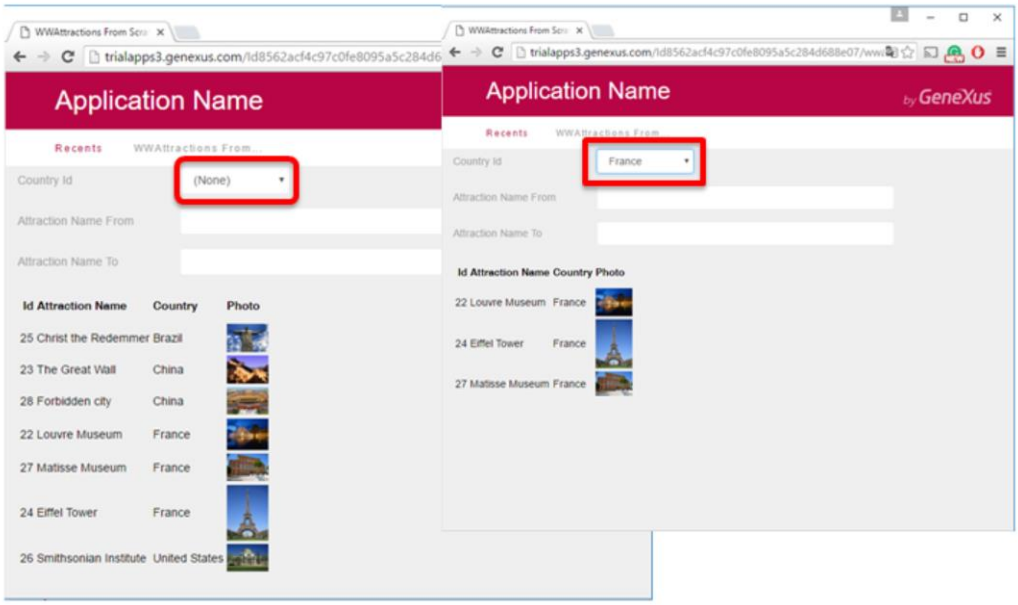


Conditional conditions

F5

So, we open the **Conditions** property and indicate that we want to have this condition applied only when the combo's value is not empty. When it is empty, the condition should not be applied.

Conditional filtering of grid data

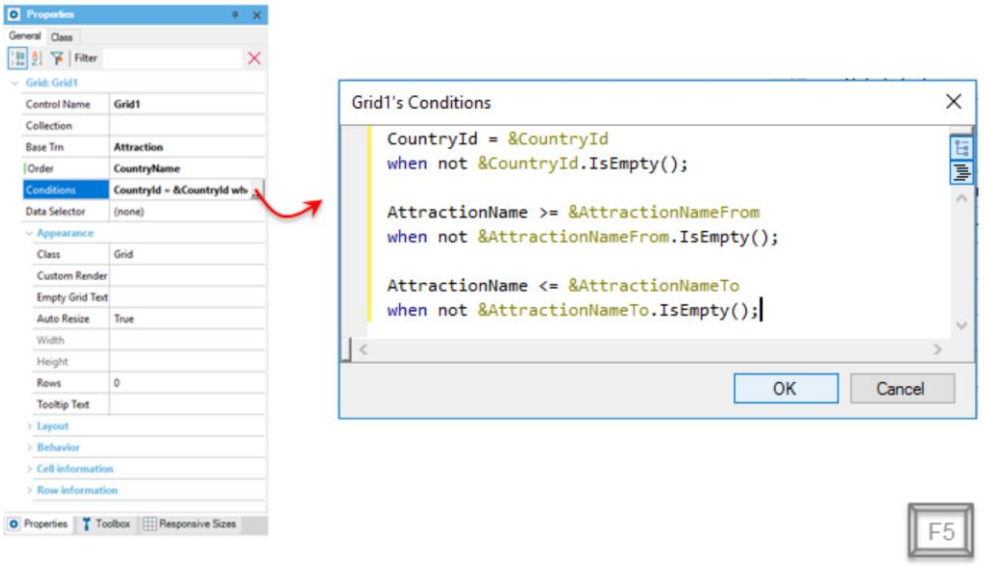


We run it...

...and see how the (None) value is displayed in the combo. In addition, in this case there is no filtering for the attractions, and all of them are displayed.

If now we choose, France, for example, since the variable's value is not empty, the filter is applied and the attractions in France are displayed.

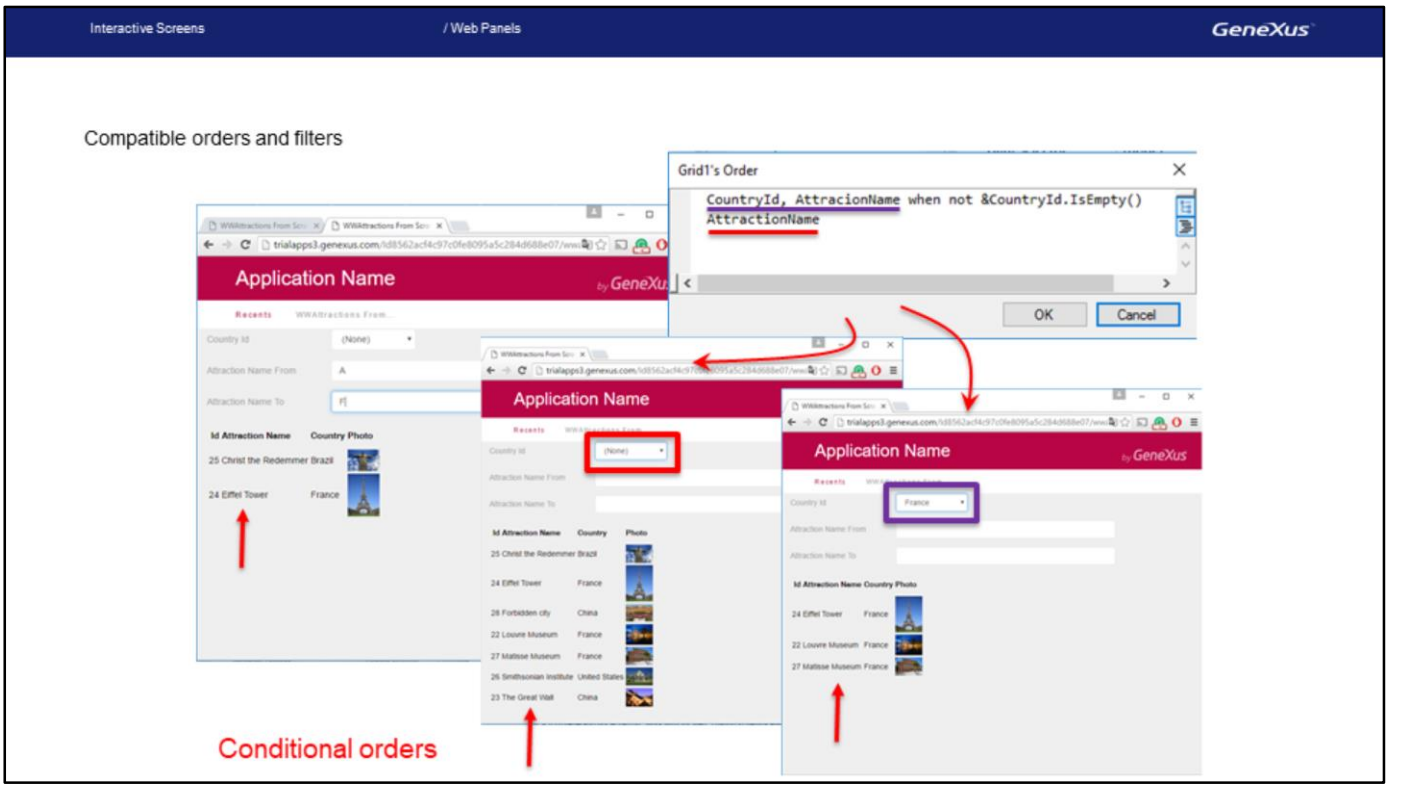
Filtering grid data by multiple conditions



We would also have to add the filters by attraction name that we want added to the other filter. So, if in the listing we filtered in the For Each command using these two Where clauses... we will add them to the grid as conditions.

AttractionName greater than or equal to the value of the &AttractionNameFrom variable of the form, which may be entered by the user. Once again, if the user doesn't enter a value in the variable, we will not want this filter to be applied. So, we use the When clause. This clause may also be used in the Where clause of the For Each command, in a completely analogous way.

We add the other filter.



We run again. And now we choose to see the attractions between A an F.

For the case when the user selects a country, we may instruct the web panel to then sort the information by CountryId, and inside CountryId by AttractionName, or otherwise, by AttractionName. This is meant to optimize the search of table records.

To do it, we edit the Order property of the grid and write the order first, conditioned to the selection, by the user, of a country in the combo. In this case, the data will be filtered by that country, and also the attractions will be listed in alphabetical order for that country. If the user left the combo empty, with the "(none)" value, then the following order –by AttractionName– will be selected.

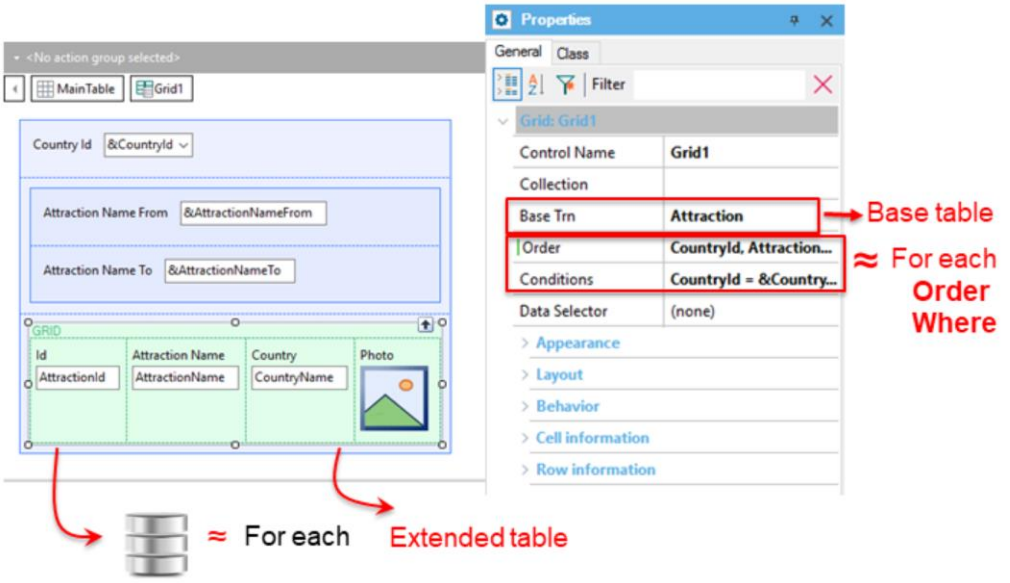
We will not go into further detail here. The purpose of mentioning this was just to show that we can also condition the way in which we want to have information ordered. It works exactly like in a For Each command.

We run it...Here, it ordered by AttractionName. And if we select France, it will order by France's ID, and inside it, by AttractionName.

In sum, attractions will always be shown in alphabetical order.

If, within France's attractions, we want to see those between the letters A and F, we will see that the grid will load filtering by the three conditions we had added.

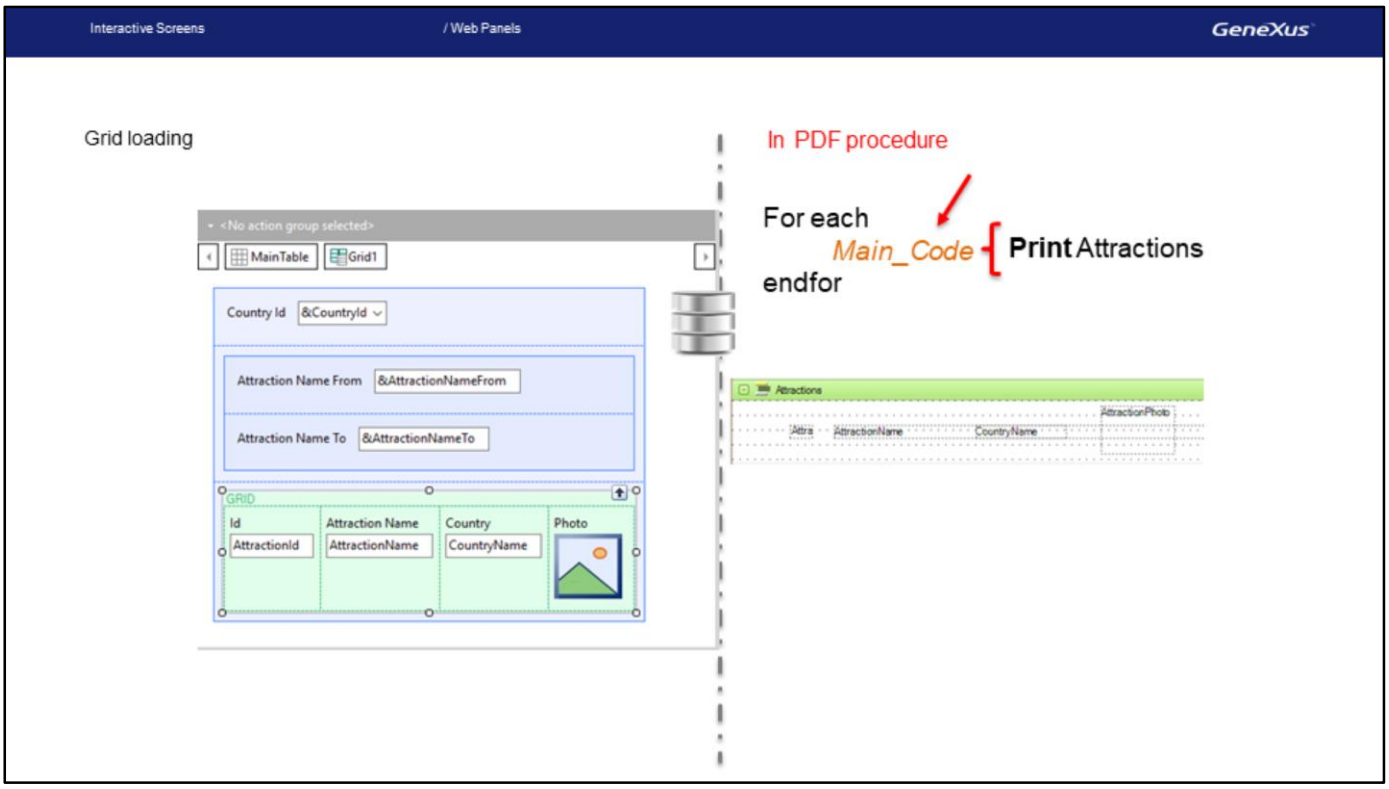
In summary



We implemented a web panel where, in addition to including some variables for which the user enters values, we also inserted a Grid control with attributes.

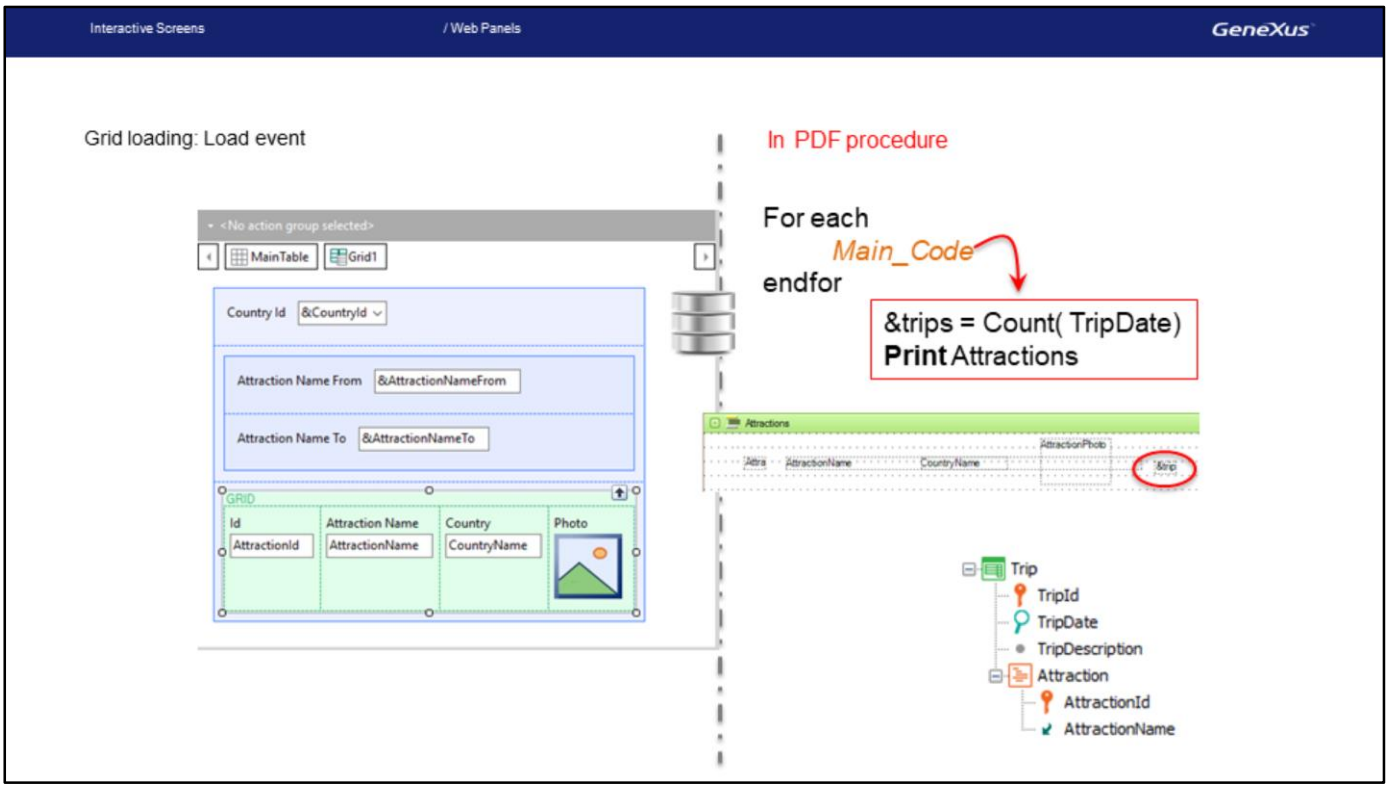
The attributes correspond to information in the database, so GeneXus understands that it has to search for it. A grid with attributes is like a For Each, so, we have the **Base Trn** property, as in the case of a For Each, to specify the level of the transaction whose associated table we want to run through. This table is called **grid base table**. When we don't specify it, as it may also be the case with a For Each command, then GeneXus will infer it based on the attributes used. However, we will not be considering such case at this point.

All the grid attributes will have to belong, as in a For Each command, to the extended table of that base table. Just like in a For Each we order data with the Order clause and filter the data to be returned by the query with one or several Where clauses, in order to do the same with the grid we have, respectively, the Order and Conditions properties.

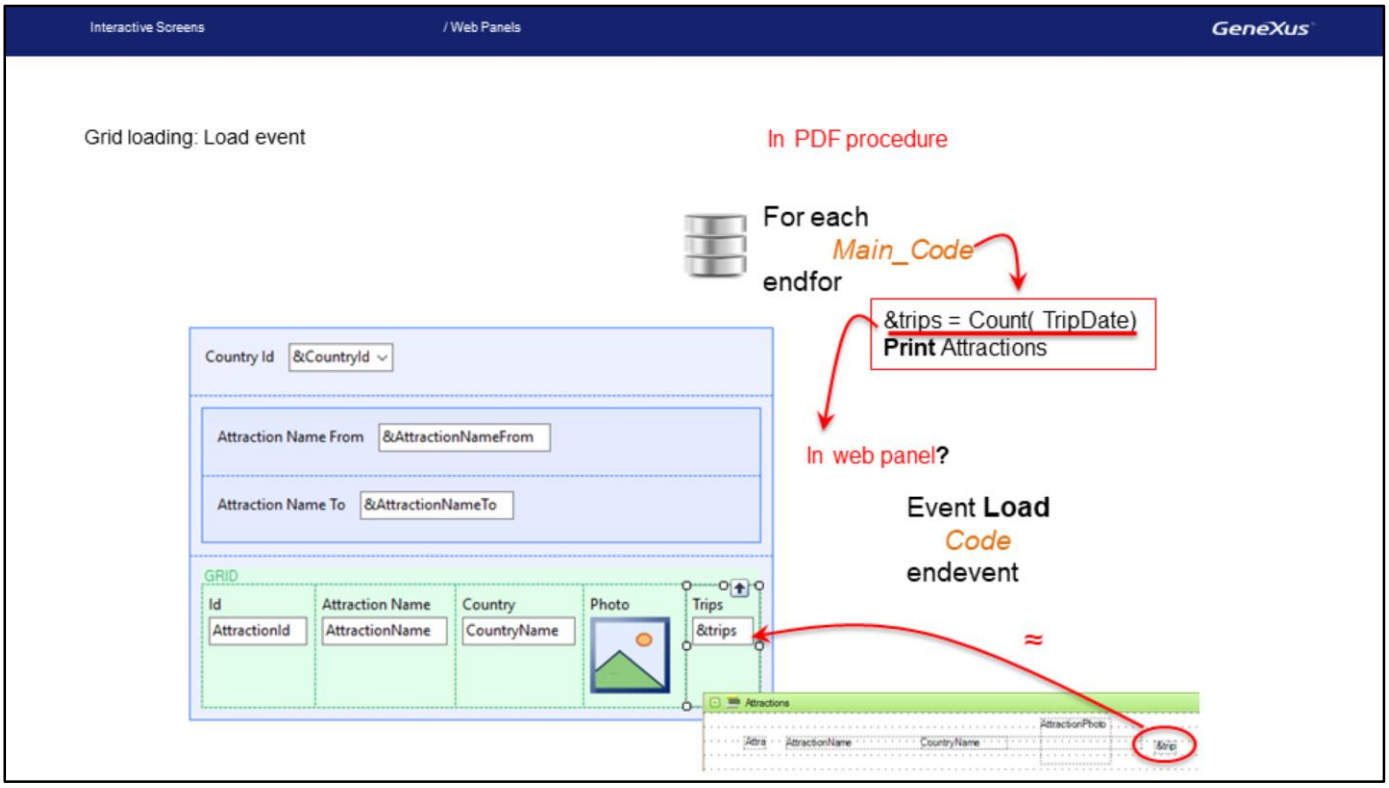


In a For Each command we program what we want to do with each record that meets the conditions inside its body.

For example, in the list of tourist attractions, the print Attraction command sends for print, in the output, what in this case would be the grid line, but in the case of the grid, we need not indicate it because it is done automatically.

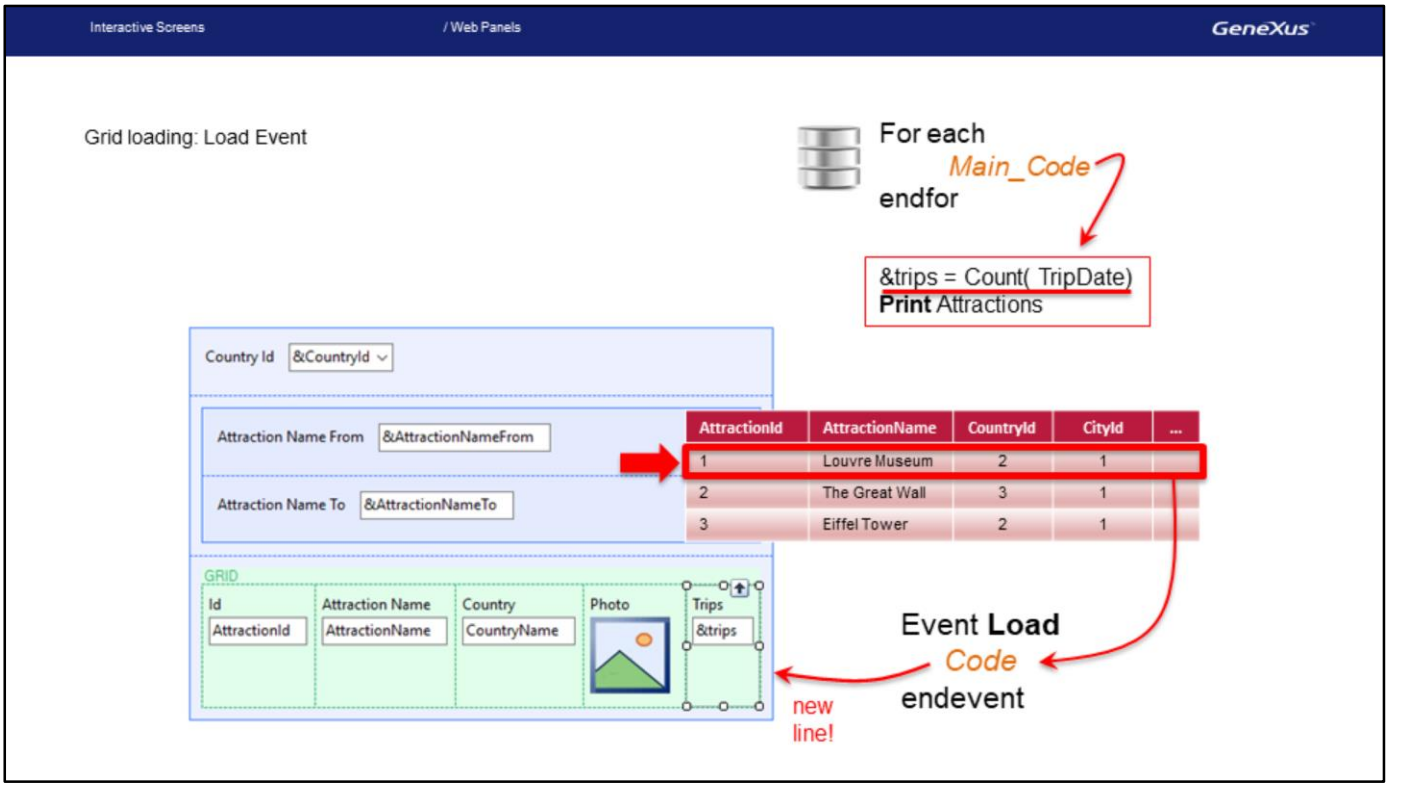


But let´s suppose, for example, that we have a Trip transaction that records the trips offered by the travel agency. In a very simplified way, suppose that for every trip we only record the date on which it will take place, and its description; and then the tourist attractions that will be visited during that trip are recorded. Let´s also suppose that in the list of tourist attractions we also want to see the number of trips associated with each attraction. To do so, we only needed to define a numeric variable &trips, and inside the body of the For Each command (that is to say, when the For Each command is positioned on the record of its base table about to be processed) assign it the result of counting the trips of that attraction, to then include that variable in the print block.



To do the same in the web panel, we right-click on the grid and select Insert Attribute/Variable. We create the &trips variables, with type Numeric(4,0), and we move it to the position where we want inside the grid. This corresponds to having inserted the variable in the print block. But, where do we indicate how the calculation is done? In the case of the For Each command, we did inside its body. And where do we do it in this case?

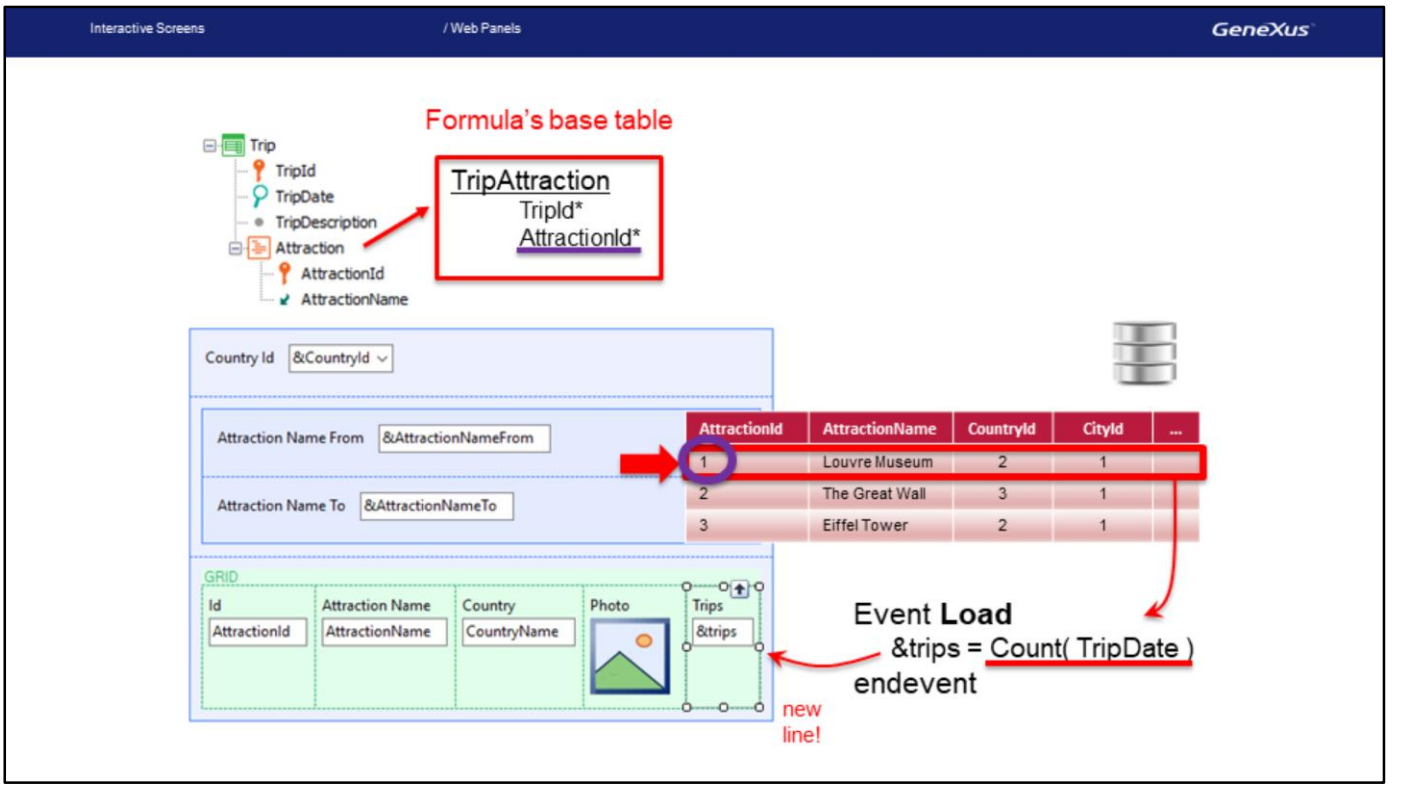
To do this we have the system's **Load** event.



Inside it we program what we want executed when we're positioned on a record of the grid base table, right before the corresponding line is loaded in the grid.

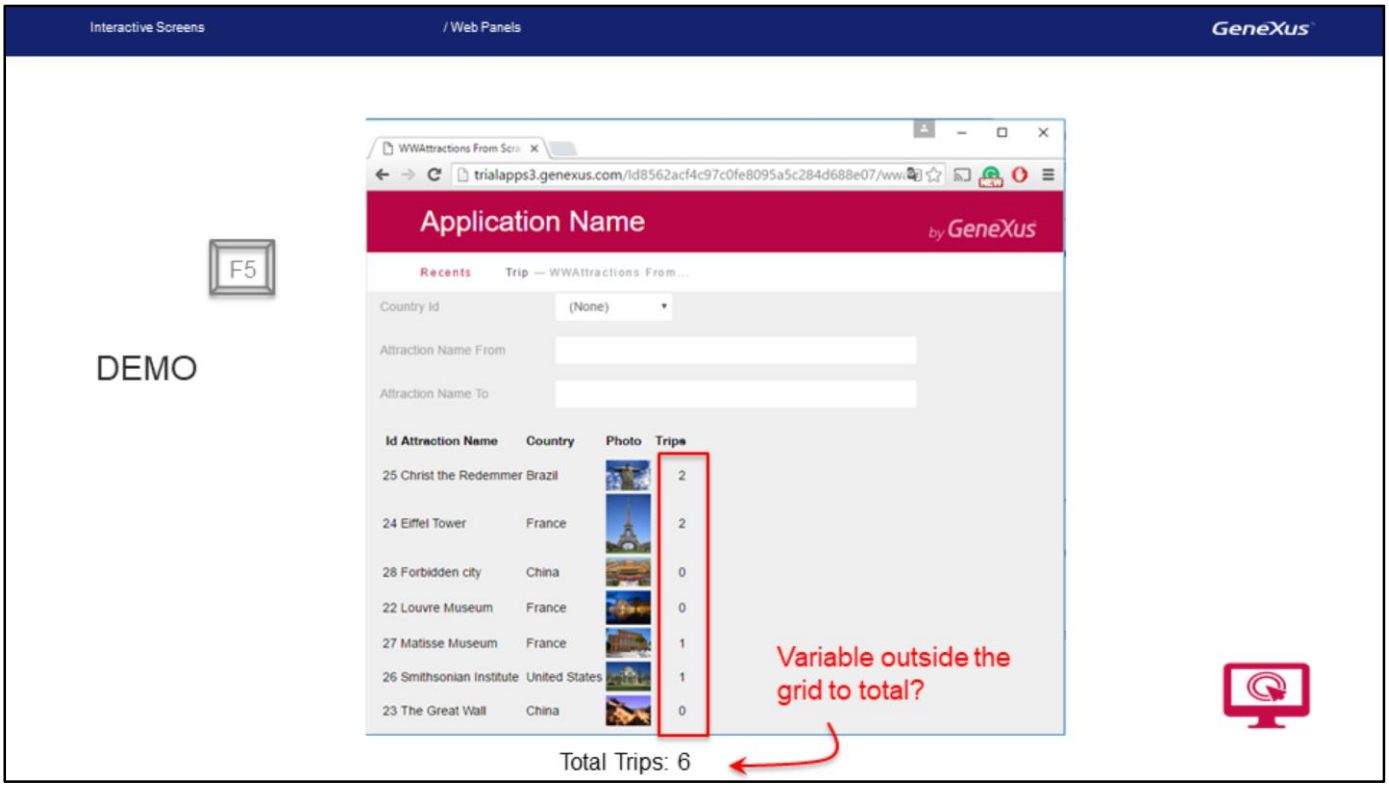
In this case, there is where we would assign a value to the &Trips variable.

The Load event will be automatically executed for every record of the grid base table that meets the filtering conditions, immediately prior to the addition of the line to the grid.



That's why, when its code is executed, we know we're working with a record from the base table and its extended table; and this inline formula will not count all the trips. Instead, it will count only those from the TripAttraction table that correspond to this AttractionId, that of the Attraction record that we're about to load in the grid.

Note that even though the TripDate attribute belongs in the Trip table, GeneXus will not choose the Trip table as the formula's base table, but the TripAttraction table. We will not go into this here, but TripDate is in the extended table of TripAttraction, table which has a relationship to the Attraction table. GeneXus looked for a table which allowed relating the data.



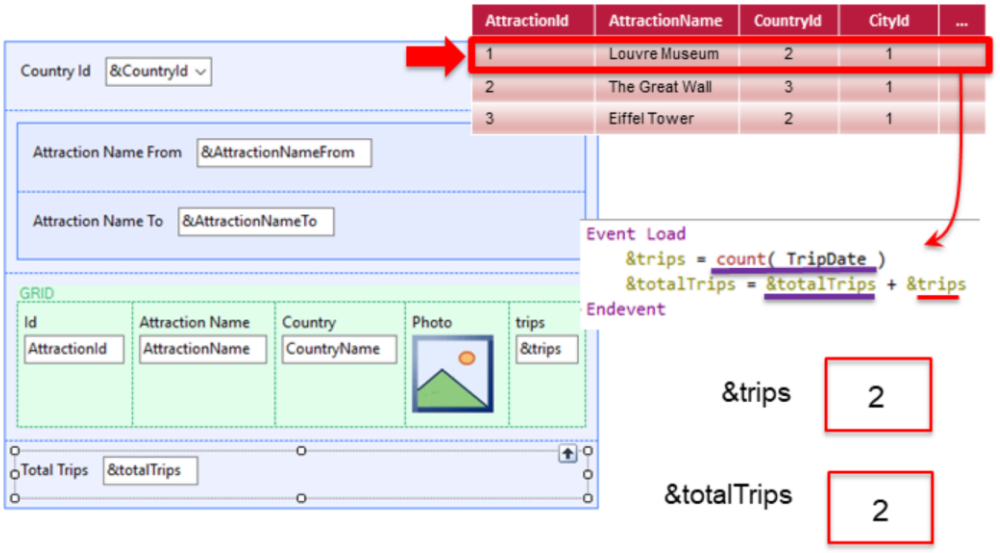
Let's implement it in GeneXus. We've already created the Trip transaction. Now we go to the events section of the Web Panel. In this combo box, we're offered predefined events; that is to say, system events that are generated at specific moments, and for which we may program code.

Among them is the Load event. Here we will program what we want executed every time we're positioned on a record from the Attraction table, before loading the line in the grid.

We run it...

Now we want to add the sum of trips in which the attractions displayed on the grid are included. That is to say, the sum of the values in this column:

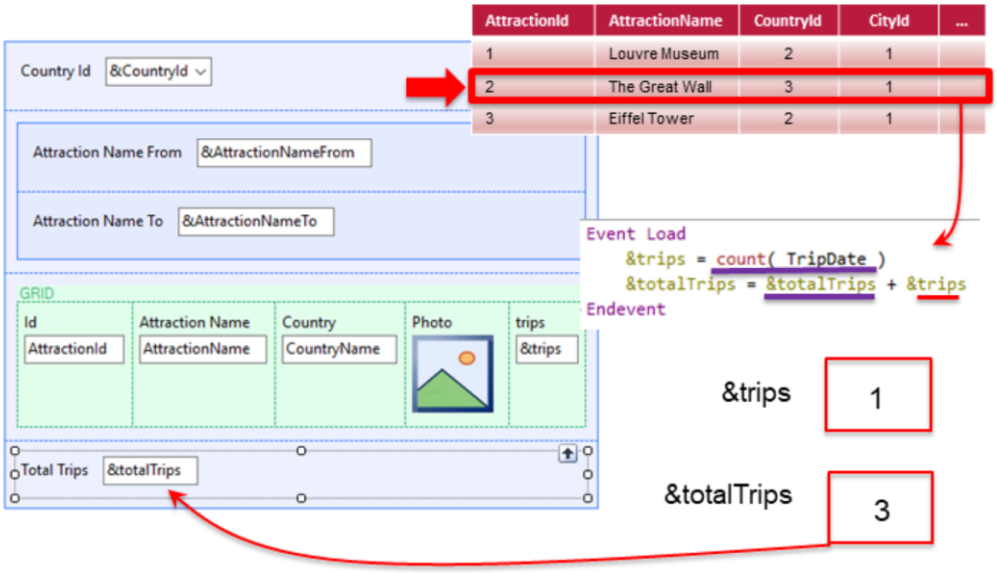
Variable outside the grid to calculate the total



An efficient way of calculating the value that the variable will have to display is... every time a line is to be loaded in the grid, we should add the value of the &Trips variable of that line, to the value calculated so far in &totalTrips.

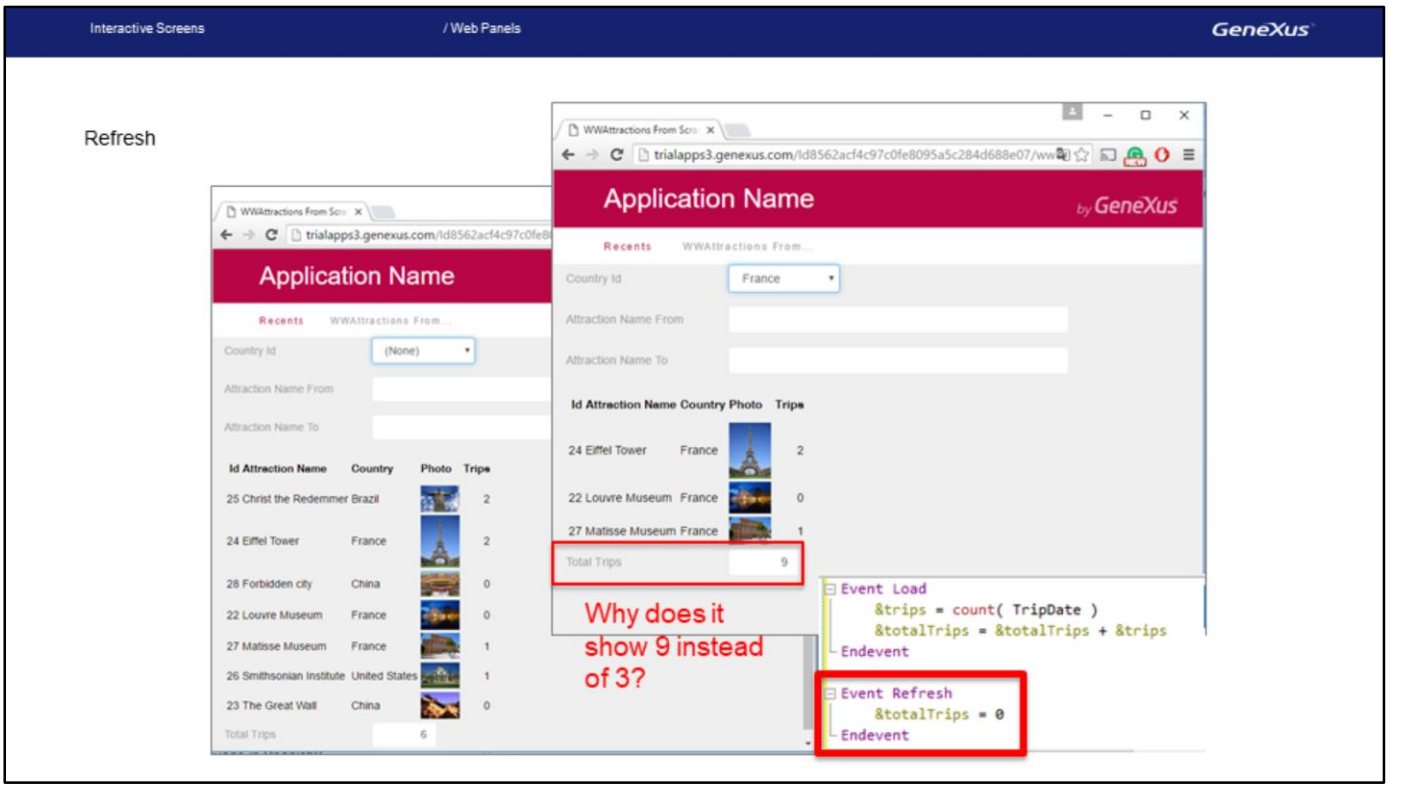
This means that, in the Load event, after calculating the value of &trips, we assign to &totalTrips the value that it contains so far plus the value of the &trips variable.

Variable outside the grid to calculate the total



For the second line to be loaded, the value of &trips is calculated and &totalTrips will contain the previous value, to which the value of the &trips variable will be added for this second line, and so on.

Once the last line has been loaded, the &totalTrips variable will have the desired value.



Let's run it.

We can see two things: first, the sum is being made correctly; second: because it is a variable, it is an input method where the user may change the value, and this doesn't make sense. So, the first thing to do is set it as Readonly.

To do so, we click on the variable in the form and, among its properties, we change its ReadOnly variable by setting it to True.

We may find it odd that &trips, which is also a variable, is shown as Readonly even when we did nothing in that sense. When no events have been programmed at the line level and when they are not run through by code, grid variables will always be Readonly. We will be seeing this in detail further ahead.

Let's also see what happens if, for example, we filter by France

Instead of showing a total of 3, it shows 9, which is the sum of the value displayed before –6– plus the 3 that it should be displaying now. Why did this happen?

After changing one of the filter variables, the web panel loaded the grid again, meaning that it queried the Attraction table in the database again, and it executed the Load event again for every record that met the filters criteria. The problem is that the &totalTrips variable should have been reset, returning it to zero, before the start of the grid load.

Where do we do this? In the **Refresh event**.

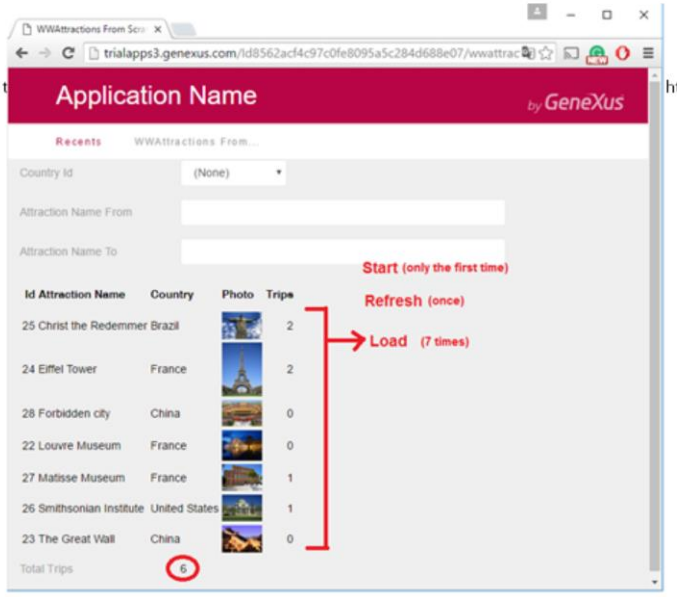
Note that the order in which the events are written is not important. Here we will only indicate the code that will be run when each one of them is triggered.

Refresh Event

- System event: It occurs every time the web panel is t ht before running the Load event for each line to be loaded).

```
Event Load
    &trips = count( TripDate )
    &totalTrips = &totalTrips + &trips
Endevent

Event Refresh
    &totalTrips = 0
Endevent
```

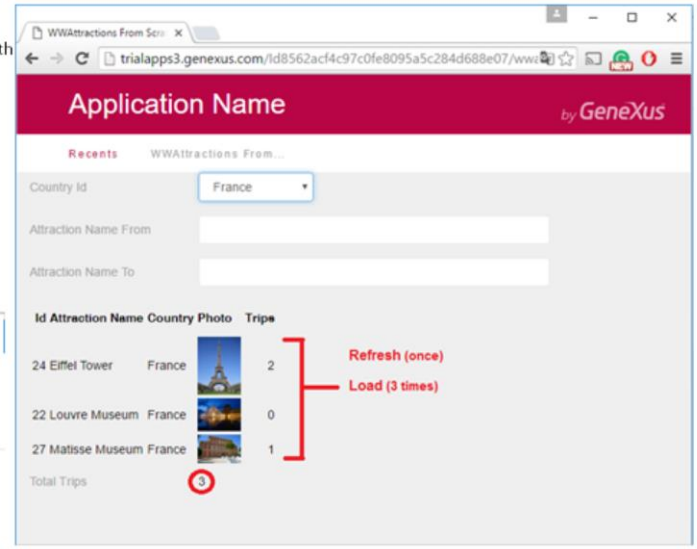


Let´s now press F5.

We will see that the total number of trips is now Readonly. To run this web panel for the first time, three events were triggered in sequence: the **Start event**, which is run only when the web panel is opened for the first time, the **Refresh event**, which set the variable to zero, and the **Load event**, as many times as lines were to be loaded in the grid. In this case, they were 7.

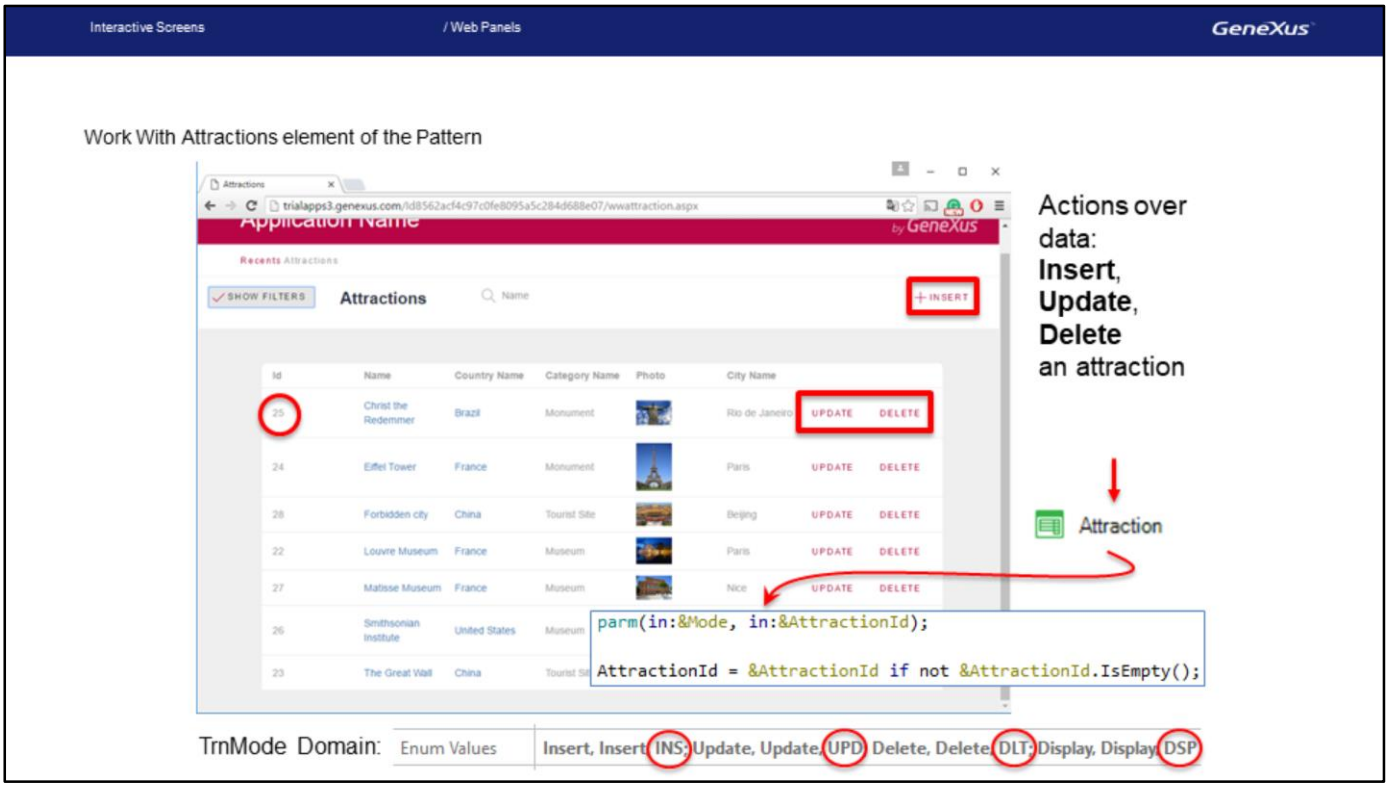
Refresh Event

- Changing the value of the variable involved in th



Now, if we filter by a country, such as France, we see that the number of trips is correctly calculated.

Changing the value of a variable that affects the conditions that must be met by the records to be loaded in the grid causes the Refresh event to be triggered again (and therefore, the &totalTrips variable is reset to zero), and the database is accessed to filter and load the records in the grid again. Therefore, the **Load** event is triggered again for every attraction in France that is to be loaded.



If we look at the web panel that we have implemented so far, we can see that it now looks like the object created by the WorkWith Pattern applied to the Attraction transaction.

Obviously, this object was a web panel.

What's most interesting is that, in addition to allowing us to filter the grid data, the WorkWith includes the option to run actions over the data. For example, updating an attraction's data or deleting the attraction or adding a new attraction.

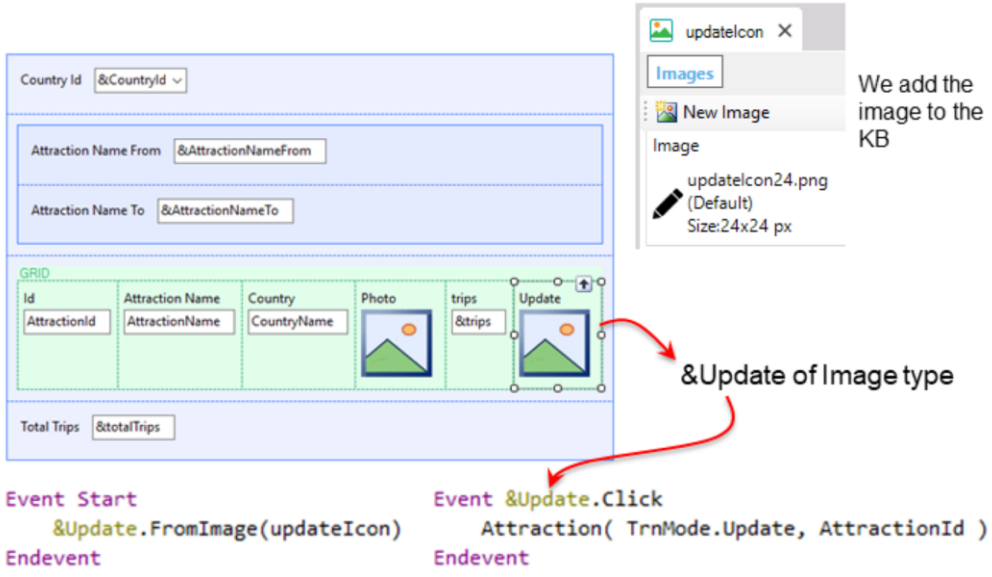
To this end, the pattern inserted two controls at the grid line level, and another one outside. In any of these three cases, the action associated with each control consists in calling the Attraction transaction, sending it, as parameter, the **mode** in which the transaction must be opened if it is called to update, delete or insert data. In the first two cases, since Update or Delete will correspond to events of one line, the ID of the line attraction will be sent as a second parameter to the transaction, in order to update the data of **that** attraction, or in order to delete **that** attraction. For the Insert control outside the grid, 0 will be sent as a second parameter, because the attractions in Insert are autonumbered.

This is why the pattern modified the Attraction transaction by adding the Parm rule, among other things. As we can see, it receives two variables: the &Mode variable is a standard variable in transactions, 3 Character, which accepts one of four values indicated in the TrnMode enumerated domain: Insert (INS), Update (UPD), Delete (DLT), and Display (DSP)

Upon receiving one of these four values, the transaction will know the mode in which it should be opened.

In addition, it will receive, as a second parameter, the attraction ID, in the &AttractionId variable, for updating, deleting or displaying.

Update action at the grid lines level



In our web panel, we will implement one of these actions over the transactions. For example, Update. The idea is to show an example of actions over the data.

We will have to insert a control in the grid. In the case of the pattern, a character variable called update is inserted. It is assigned the "UPDATE" text that we see in runtime. But we will choose to insert an image, which we must insert in the KB to start with. We will call it updateIcon.

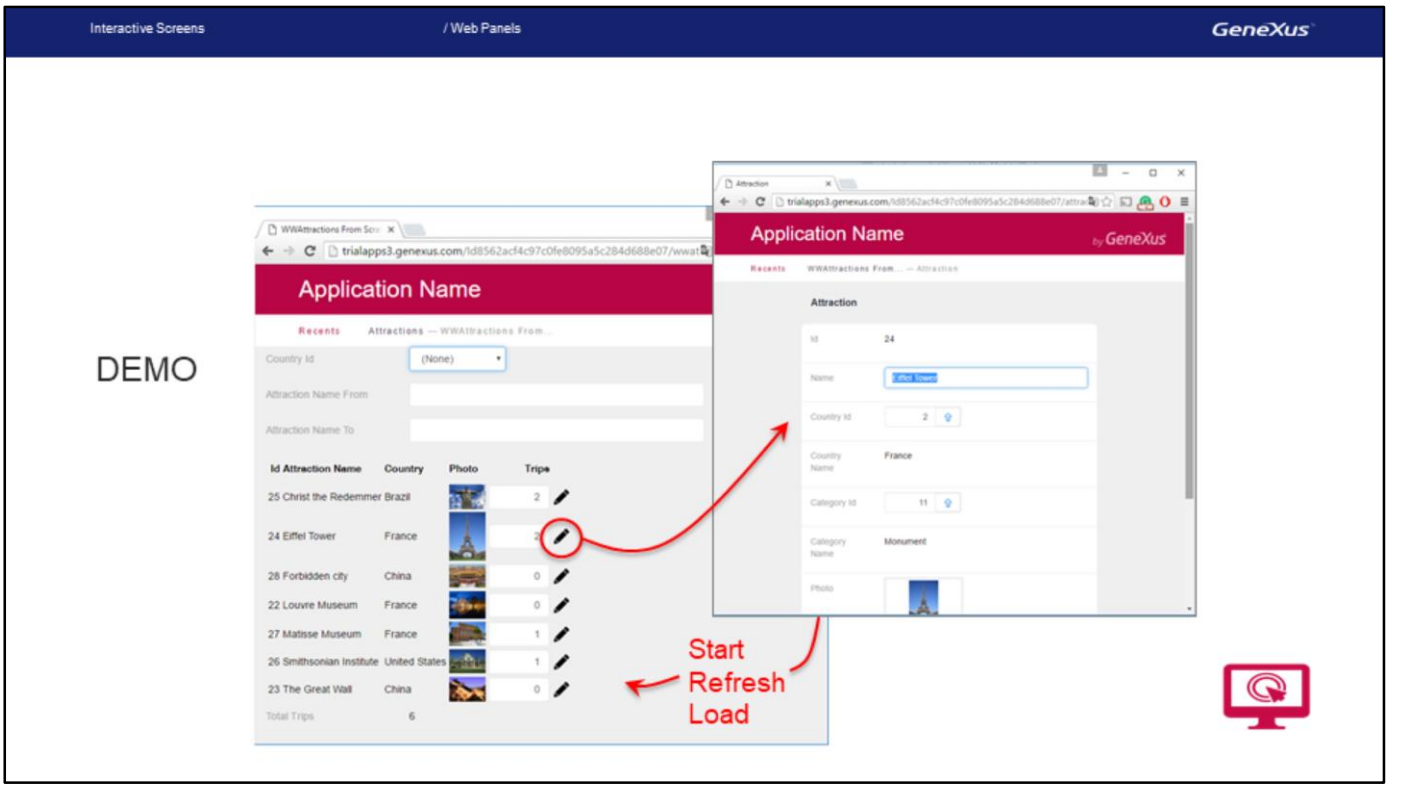
Now we go to the web panel and drag the Attribute/Variable control from the toolbox to the last grid column, and define the new variable as &Update, of the Image type instead of character. We remove the title so that it isn't displayed as a column title and then we need to load that variable with the image we've just inserted in the KB. Where do we do this?

If the image changed according to the grid line, we would then do it in the Load event. But since the image will never vary and will remain the same for every line, then a good option is to do it in the **Start event**, which will be run only once, when the web panel is opened.

Now we need to associate an event with that image, so that when the user clicks on it, the event is triggered and its code is run, where we will invoke the Attraction transaction.

There are several options available to do this. One of them is to use the click event of the &Update variable control.

This will cause that, when the user clicks on the image for a line, the code that we type inside this event will be executed. In such case what we will want to do is to invoke the Attraction transaction. We will pass the Update mode, that is to say, the Update value of the TrnMode enumerated domain we saw before, and the AttractionId value corresponding to the grid line where the click was made.



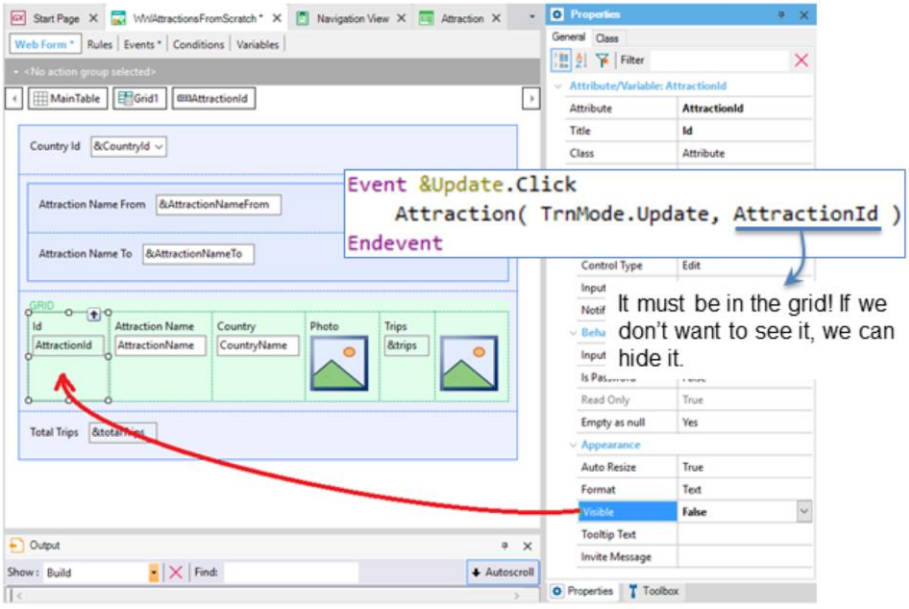
Let's run it.

First, we see that the column of the &Trips variable is now editable. We had not defined it as Readonly explicitly because we had noticed, upon the execution, that it was already done. As we said, grid variables are first added as readonly, except when an event is defined at the line level, as in this case, or under other circumstances that we will not discuss now. Let's set it as Readonly for the next execution.

We now select a country, like France. And now we click on the update image for the Eiffel Tower. In update we see the name of the transaction. Now we modify something... for example, we can change the T in Tower from uppercase to lowercase.

We now confirm... and since the work with pattern, which we have not seen, has added a Return command to the transaction, to return to the caller, we will return to the web panel. This Return command is similar to invoking the web panel for the first time, so the Start event will be executed in it, followed by the Refresh and Load events as many times as the number of records that will be loaded.

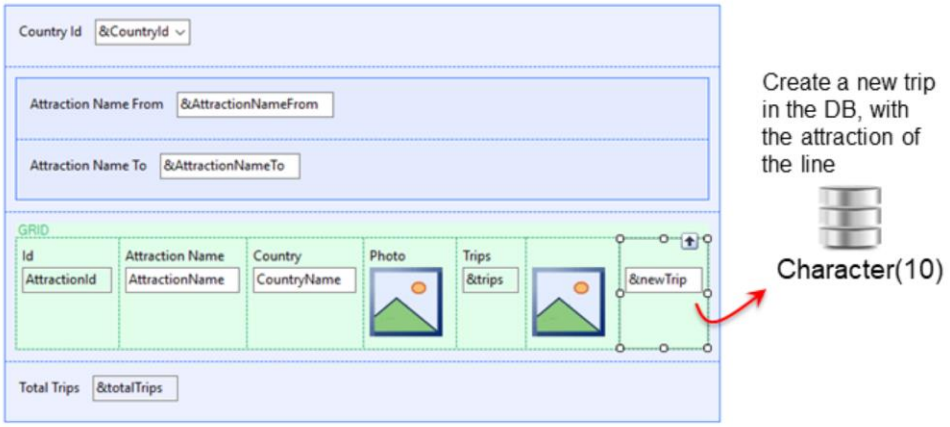
When is it not possible to include a column in the grid?



What would happen if we hadn't added the AttractionId attribute in the grid? By clicking on the image to update, what AttractionId would have been sent as a parameter to the transaction? It would not have that value to send.

Since it will be used in an event at the line level, which will be triggered after the lines have been loaded, we cannot remove AttractionId from the grid, because here, we are no longer in the database. The grid has saved, upon the loading with the Load event, all its column values and nothing else. A later event will work only on the data loaded in the grid. So, if we don't want to see this column in the grid, we can hide it. It will continue to be present, though hidden. To this end, we use the **Visible property with its value set to False.**

Another action at the lines level: refreshing the line




```
Event Start
    &Update.FromImage(updateIcon)
    &newTrip = "New Trip"
Endevent
```

```
Event &newTrip.Click
    /* Call a proc that inserts a trip and returns the number of trips of
    AttractionId */
Endevent
```

Let's now add another action at the line level. But this action will not call another object with interface as it happened in the case invoking the Attraction transaction.
We can imagine that, for instance, we will enable the possibility to create, from a line (an attraction), a new trip in the database, with that attraction.

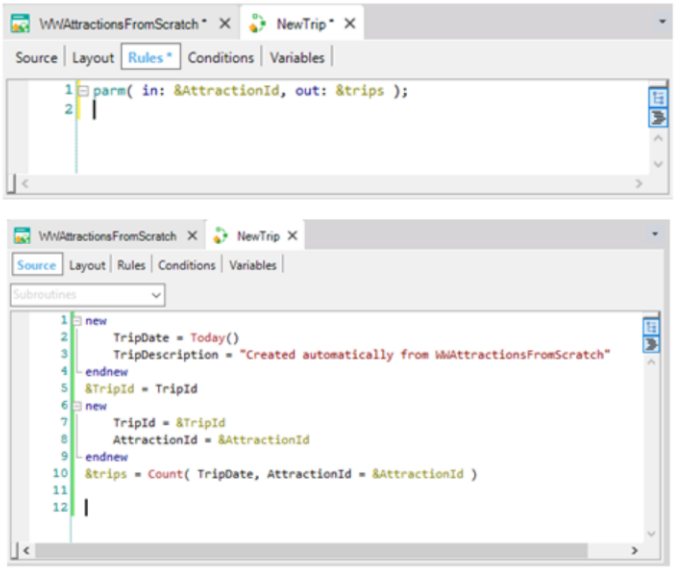
First we add a new variable –called newTrip and 10 character- to the grid.

Let's change it to ReadOnly. We want it to contain the "New Trip" text, so we assign it in the Start event because there will be no variations by line. And let's program the Click event for that variable.

What do we want to do when the user clicks on New Trip?

Another action at the lines level: refreshing the line

```
Event &newTrip.Click
  &trips = NewTrip( AttractionId )
Endevent
```



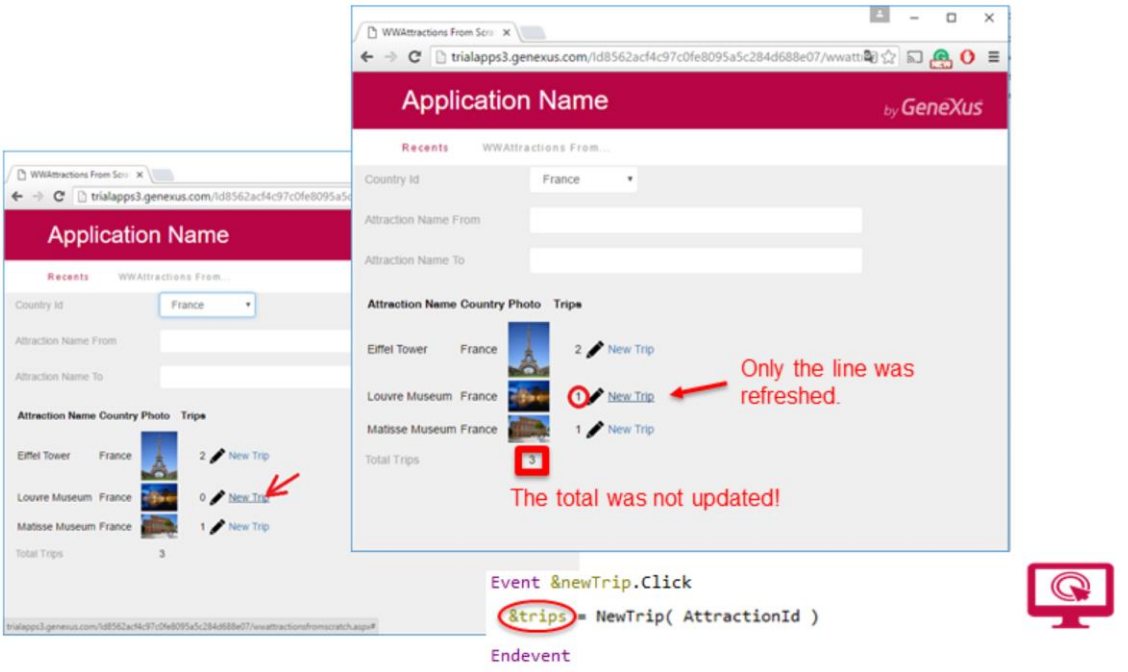
For example, call a procedure to which we pass the identifier of the line's attraction and create the trip with that attraction.

Note that we implemented it with the **new** command, to create a record directly in the Trip table and another one in the TripAttraction table. This solution shows how the commands are used. However, a more recommended solution would be to use the business component of Trip for inserting. In this course we did not see how to load a two-level business component, which is very simple to do.

We will see that, following the insertion of the header and line of Trip, we calculate the number of trips that include this attraction. Since the inline formula is triggered without positioning on any table (it is "loose" inside the code), we must indicate the explicit condition that we want to filter the trips of **the** attraction.

And that is the value returned when this procedure is called. So, from the click event of the &newTrip control (variable), we invoke this procedure and pass the AttractionId of the line from where the click is done. Since the parameter returned is the one we need to show in the &Trips column, we assign it directly to the variable.

It's only logical that, upon the user's click on New Trip, for that line, in the Trips column, the value shown should be the one it had prior to the click plus one. That is, the line should be refreshed



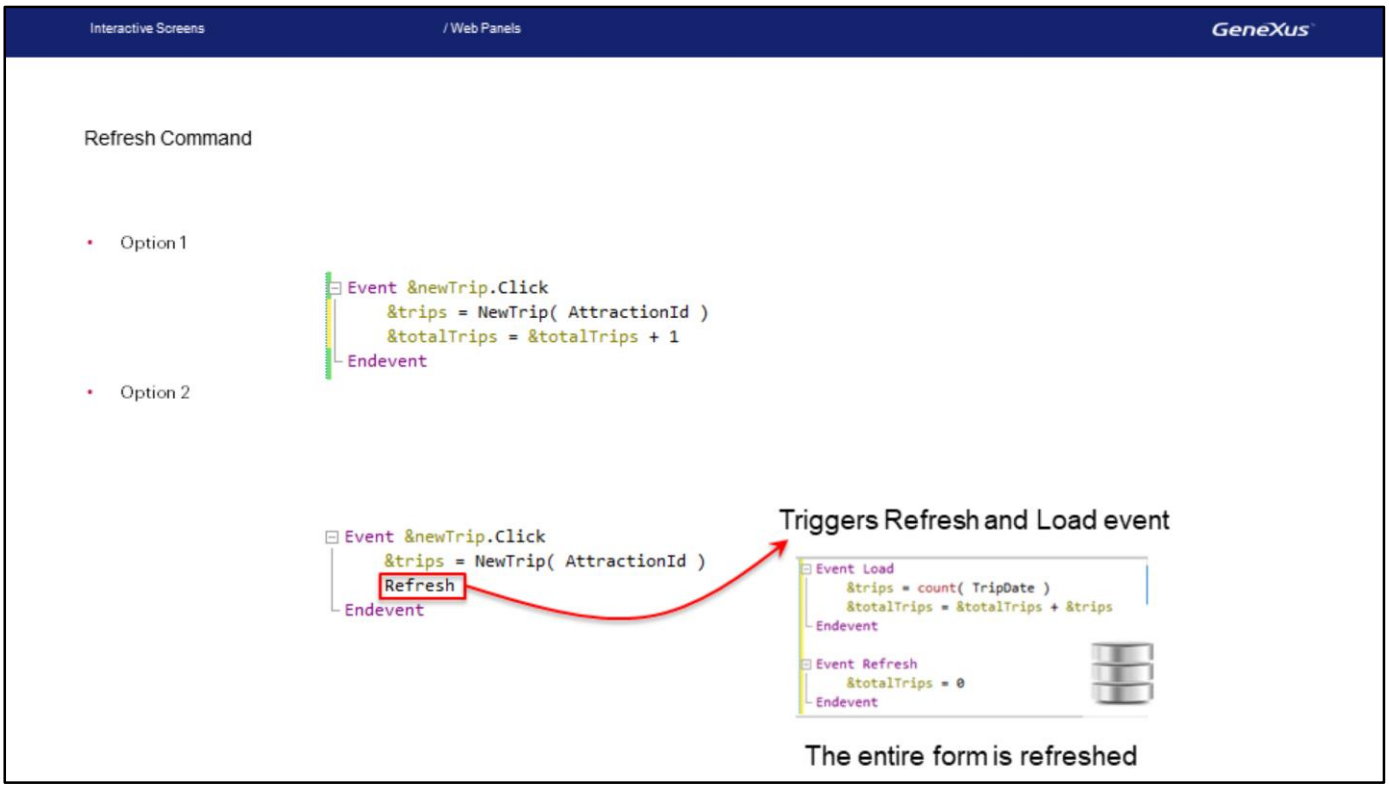
Let's execute and try.

For example, let's filter by France, and for the Louvre museum attraction, which for the time being is not part of any trip. Let's click on New Trip. We can see that the line has been automatically refreshed.

Now it shows number of Louvre trips: 1.

However, the total count was not refreshed. It should be 4 but it keeps the previous value. Why?

Upon executing the click event associated with the &NewTrip variable, only its code was executed. And because inside it a variable of the grid was assigned a value, the line was refreshed –and only **that** line. No other event was executed, not even the Load event.

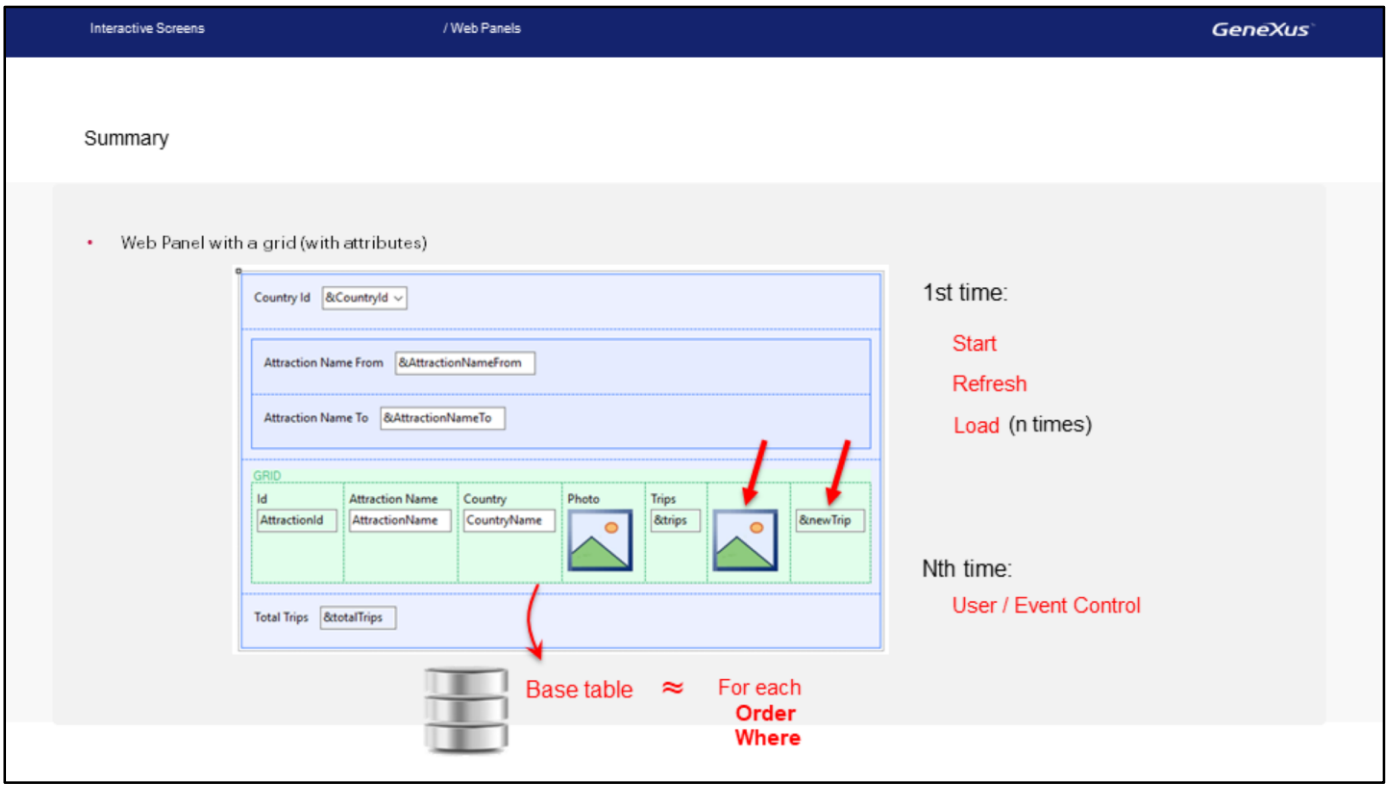


Therefore, we have two options to keep the total of trips loaded on the grid updated when this event occurs.

One possibility is to add one to &totalTrips, because the procedure only added one trip to that attraction.

But if the procedure is later changed with the addition of more trips, then we will have to remember to do the change in a way consistent with this event.

A better solution is to request the web panel to execute the Refresh and Load events again. To do this we use the Refresh command. When we do this the grid will be loaded in the data base again.



For the case of a web panel with a grid with attributes, GeneXus will understand that the grid has an associated base table, that is: a table to be navigated in order to load the grid lines. It will load a line for each record in that base table. To filter, we have the Conditions property of the grid, and to sort we have the Order property. A grid with a base table is analogous to a For each.

For the system events produced in the web panels we can program code to be executed at the time when they are triggered. We saw three of such events that are always triggered when a web panel is opened, that is, in the first execution:

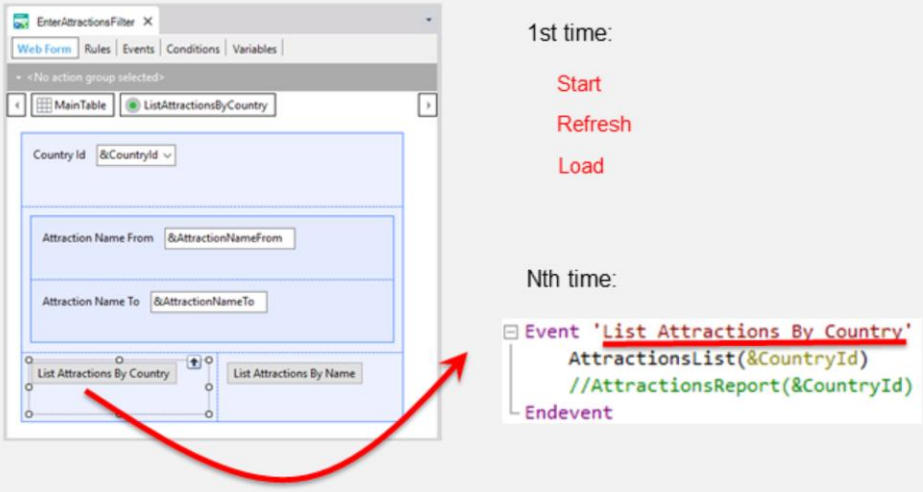
- The **Start** is triggered only once. There we can, for example, initialize variables.
- The **Refresh** is triggered prior to the loading of the screen data. Following this event, the access to the database will take place in order to bring the data of the base table and its extended table.
- A **Load** event is produced for each record on the base table that is about to be loaded on the grid. Therefore, this will be the point where all the actions we want executed before the line is actually loaded on the grid will have to be programmed. The data loaded on the grid is exclusively the data from the visible or invisible columns included in it.

After this the web panel will be loaded with the information obtained from the database and it is then disconnected from it.

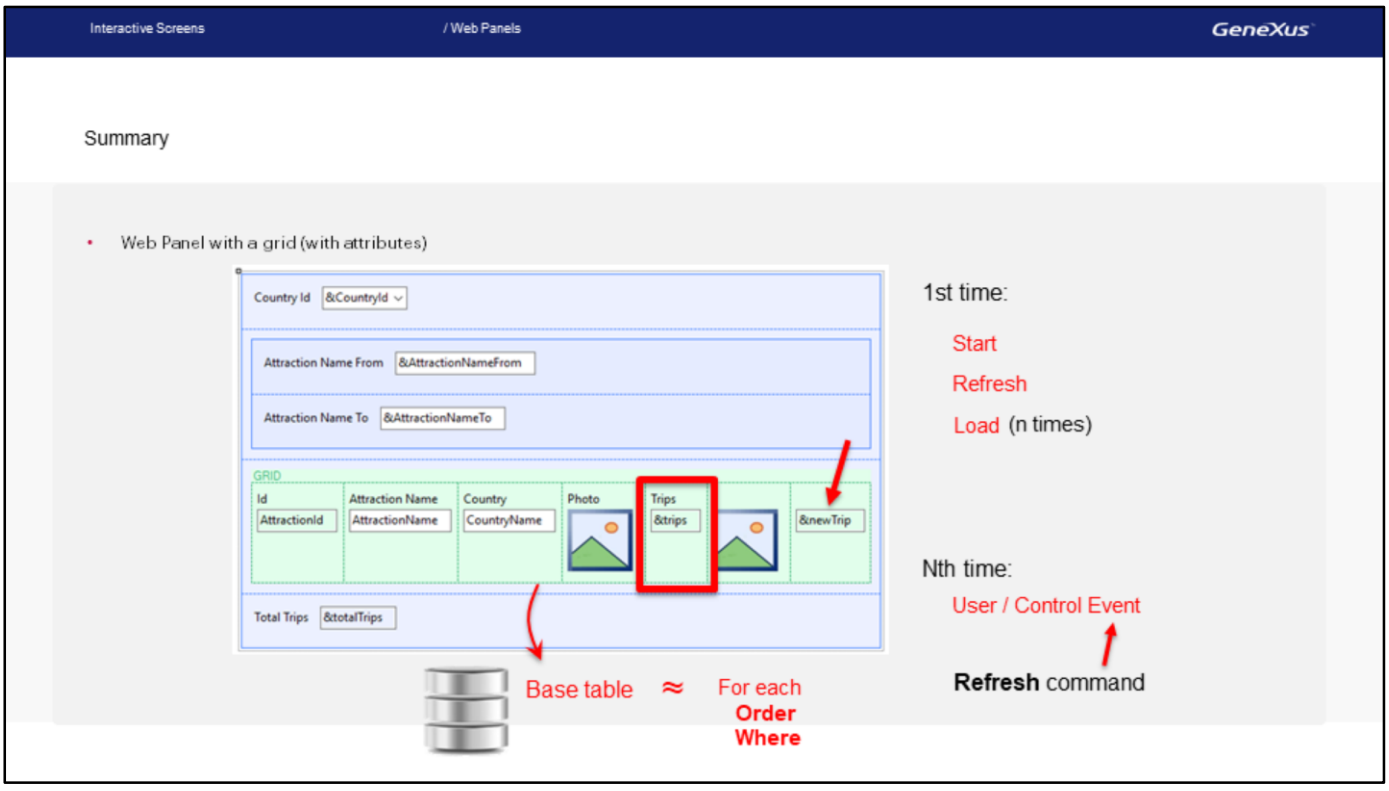
But web panels also enable the definition of other events that will be triggered after the first time. This means that they are triggered after the web panel has been loaded, always as a result of the user's action.

For example: the Click event that we programmed on this image (&update), or the Click on New Trip, or...

Summary

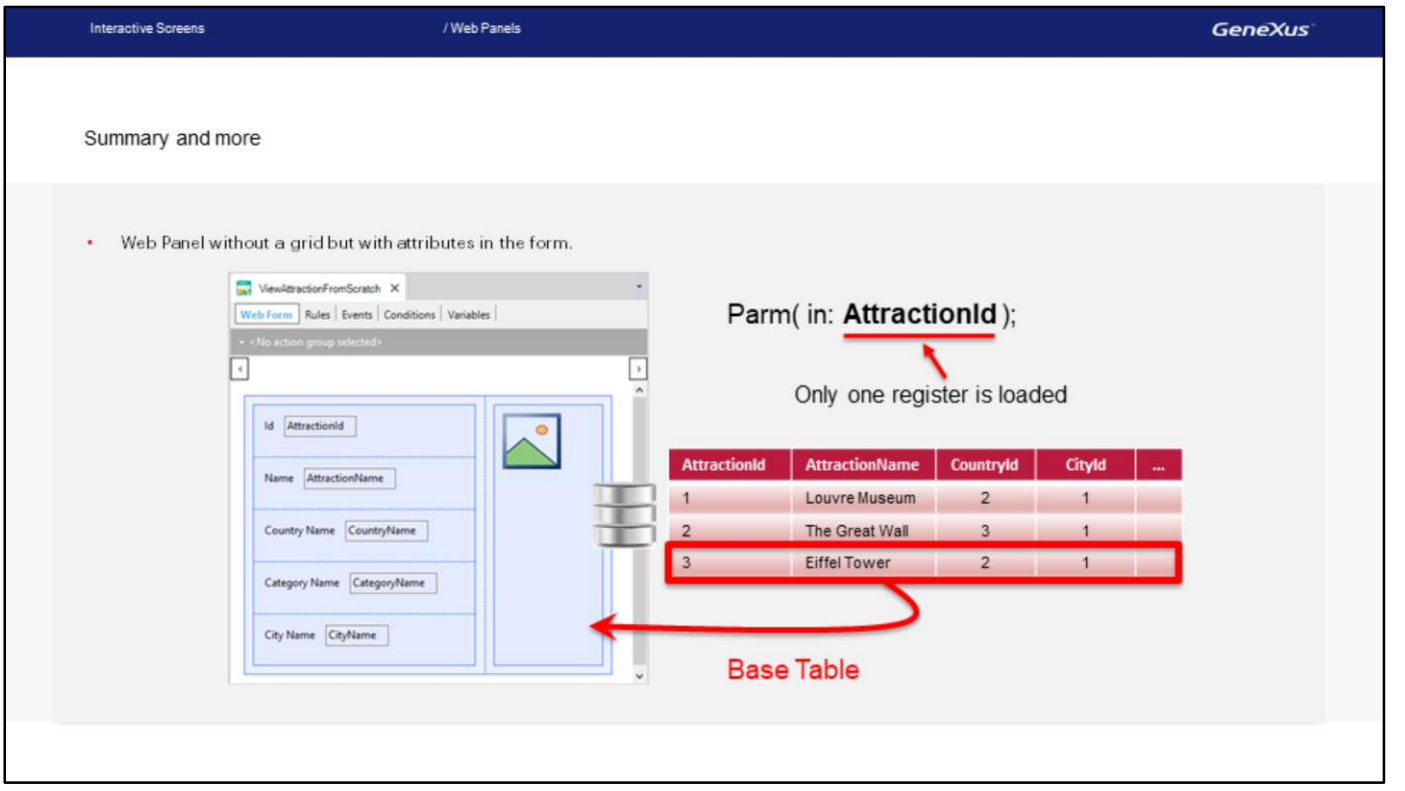


...even in the web panel we defined several classes ago, the user event we associated with the button that we called.



These events are known as **user events** or **control events** (as the Click event we saw).
When the user causes one of these events only its code is executed, without screen refreshing. The only exception occurs when the event takes place at the level of a line in the grid, as in the case we saw of &newTrip, where a variable from the same grid –in our case &Trips– is assigned inside its code. In this case, the value of the variable is refreshed on screen, for that line, so it is shown updated.

When we need the Refresh to be executed again and the lines loaded again on the grid from the database (for example to update the total of lines), we may write the **Refresh command** in the event.



We studied the case of a web panel with a grid with attributes. But, what if we have a web panel without grid and with attributes in the form?

Let's suppose that we want to click on the name of the attraction, in our web panel WWAttractionsFromScratch...and call a web panel to show all data on that attraction.

To do that we have already implemented this web panel... where we have inserted, in its form, the attributes of an attraction that we want to show.
We also wrote a parm rule to receive a parameter. We can see that, instead of receiving in a variable we decided to receive in the AttractionId attribute.

What we want is that when this web panel is called from the Click event of AttractionName in our other web panel... to pass the Id of the attraction of the grid line, GeneXus automatically go to the attractions table to find the attraction with that Id, and show, for that attraction, the information on the attributes located in the form.

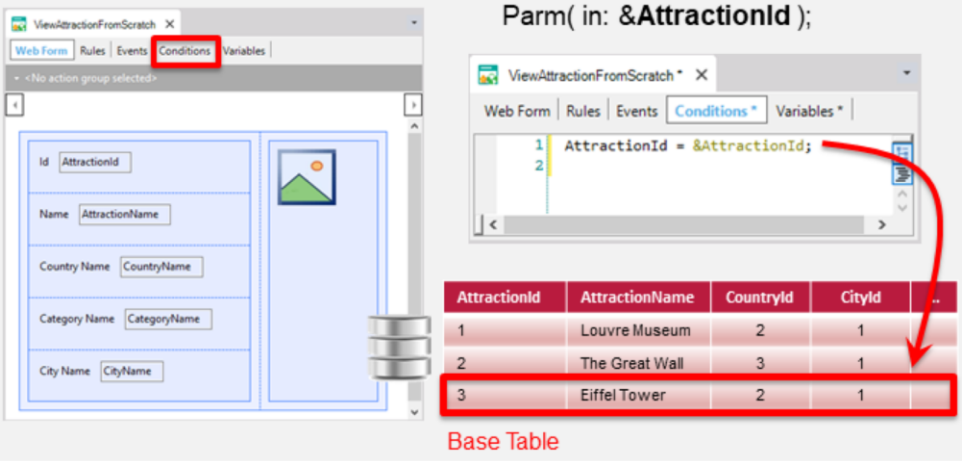
In sum, a web panel that has no grid but containing attributes on the form will also have base table. How does GeneXus determine it if we don't have base transaction to indicate? That is something we will not see in this course, but it's something similar to the case of a For each where no Base Transaction is indicated.

But in this case, since we don't have a grid, only ONE record from that base table and its extended table will have to be loaded. Where do we indicate the filter to enable the return of that record?

In our case, it received in the AttractionId attribute. There we specify the automatic filter to indicate which record from the base table must be taken.

Summary and more

- Web Panel without a grid but with attributes in the form.



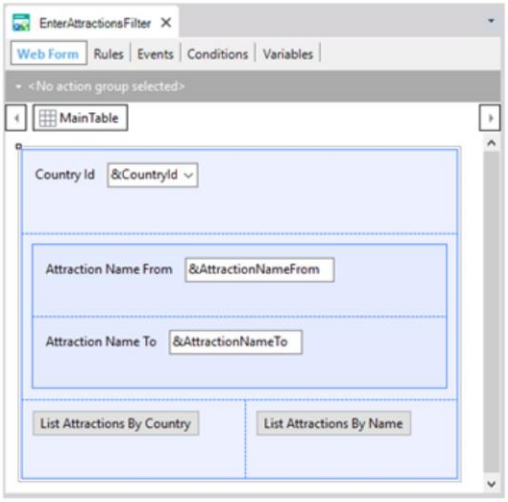
If we need to establish another type of condition, or if we received in variable instead of in attribute, we have the Conditions tab to establish the filter.

Web panels with base table

So far we have seen two web panels with base table:

- the first one with a grid. There, the base table of the grid is the base table of the web panel, that is: the table that the web panel automatically decides to navigate to retrieve the information to be loaded on screen.
- the second one without grid, but with attributes. There, the base table of the web panel is found from those attributes.

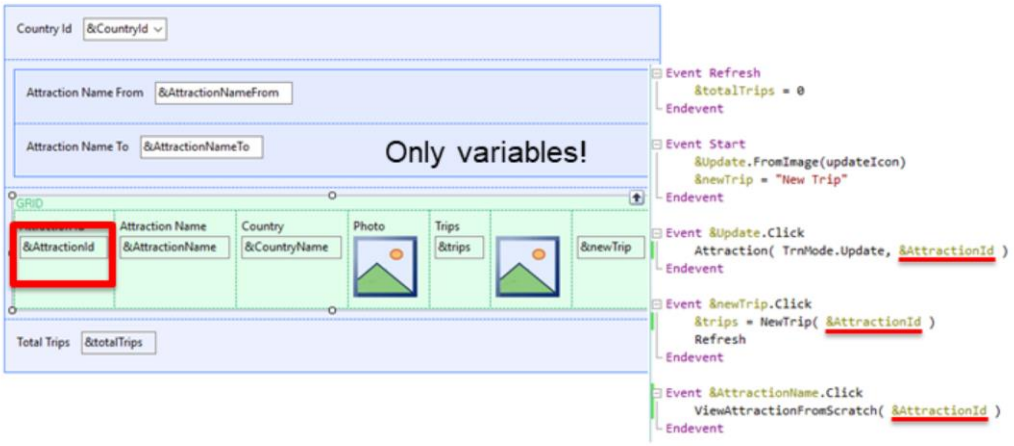
Web panels without base table



We will now see the case of web panels without base table, that is: web panels that do not have a query to the database programmed **automatically.**

The case most evident is when no query is made at all to the database, as in the case of our initial web panel, which only requested data from the user and called other objects.

Web panels without base table



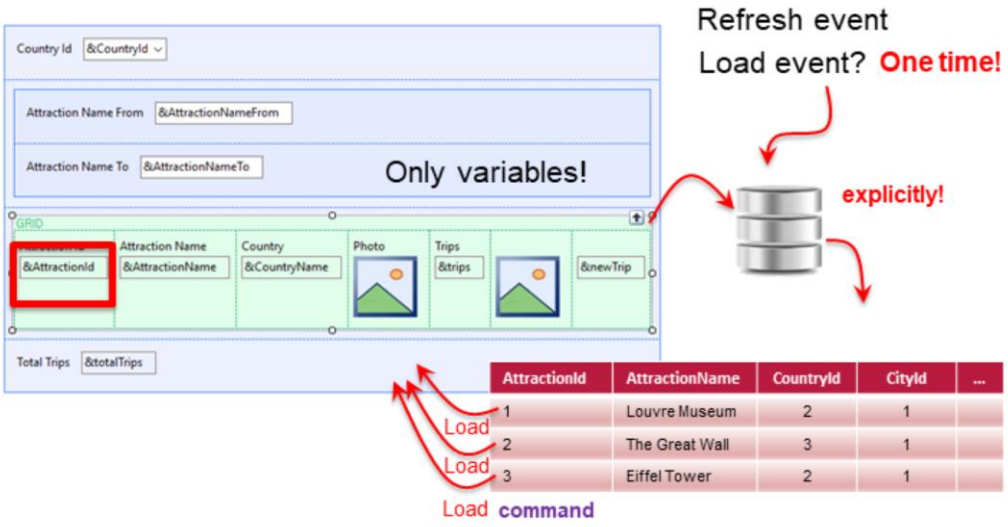
But we can also have a web panel that does query the database, with that query and load on screen fully in hands of the developer.

The web panels we implemented with base table could also have been implemented in this manner.

Let's see the case of the web panel that shows the attractions in the grid, but this time, instead of having attributes in the grid we will have variables.

So, in the events we have to change the invocations we had, where we passed the AttractionId attribute in the &AttractionId variable.

Web panels without base table



If we now have only variables, how does GeneXus know that it has to navigate the Attraction table and its extended table to load a line in the grid per record?

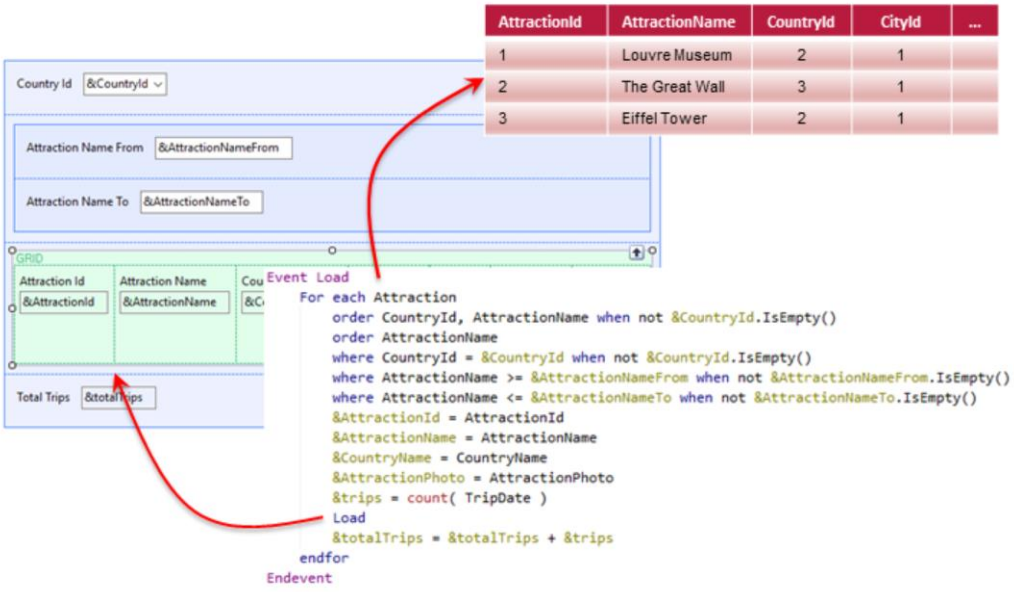
In fact, it doesn't know that. The load of this grid will not be automatic as in the case where we used attributes.
This means that the Load event will not be executed when it has gone to navigate a table for each record where we are positioned at a given moment. This is because we are not positioned anywhere!

However, the Load event will indeed be triggered, except that it will be triggered only once after the Refresh and not being in the database at all.
In that triggering, in that execution, we will have to program the grid load manually.

We will have to explicitly request access to the database (in our case by going to the Attraction table) and indicate that every time that a line is loaded.

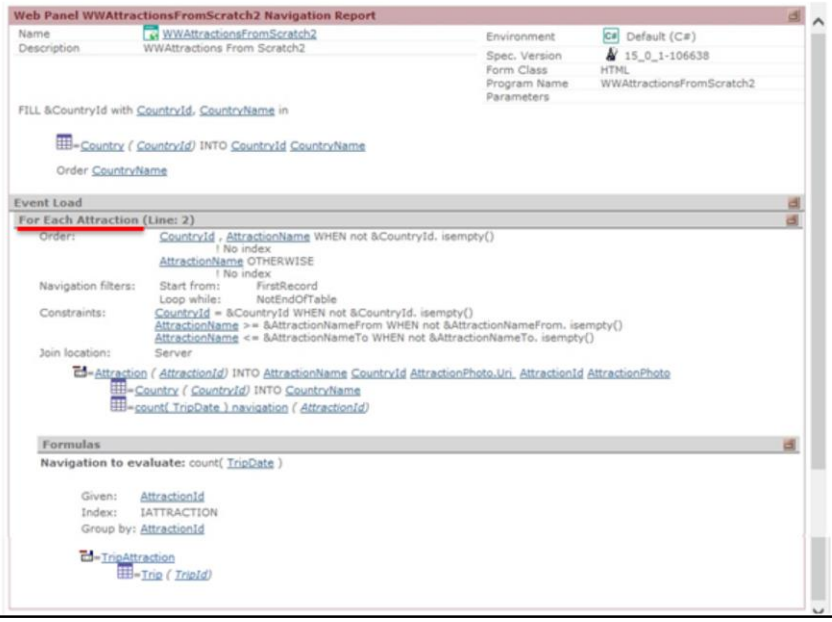
In order to instruct it to insert a new line in the grid with the values that the variables corresponding to the columns have at the time we have the **Load command** –not the event but the command. Every time that a **Load command** is inside the **Load event** (the only location where this command is allowed) a line is inserted in the grid.

Web panels without base table

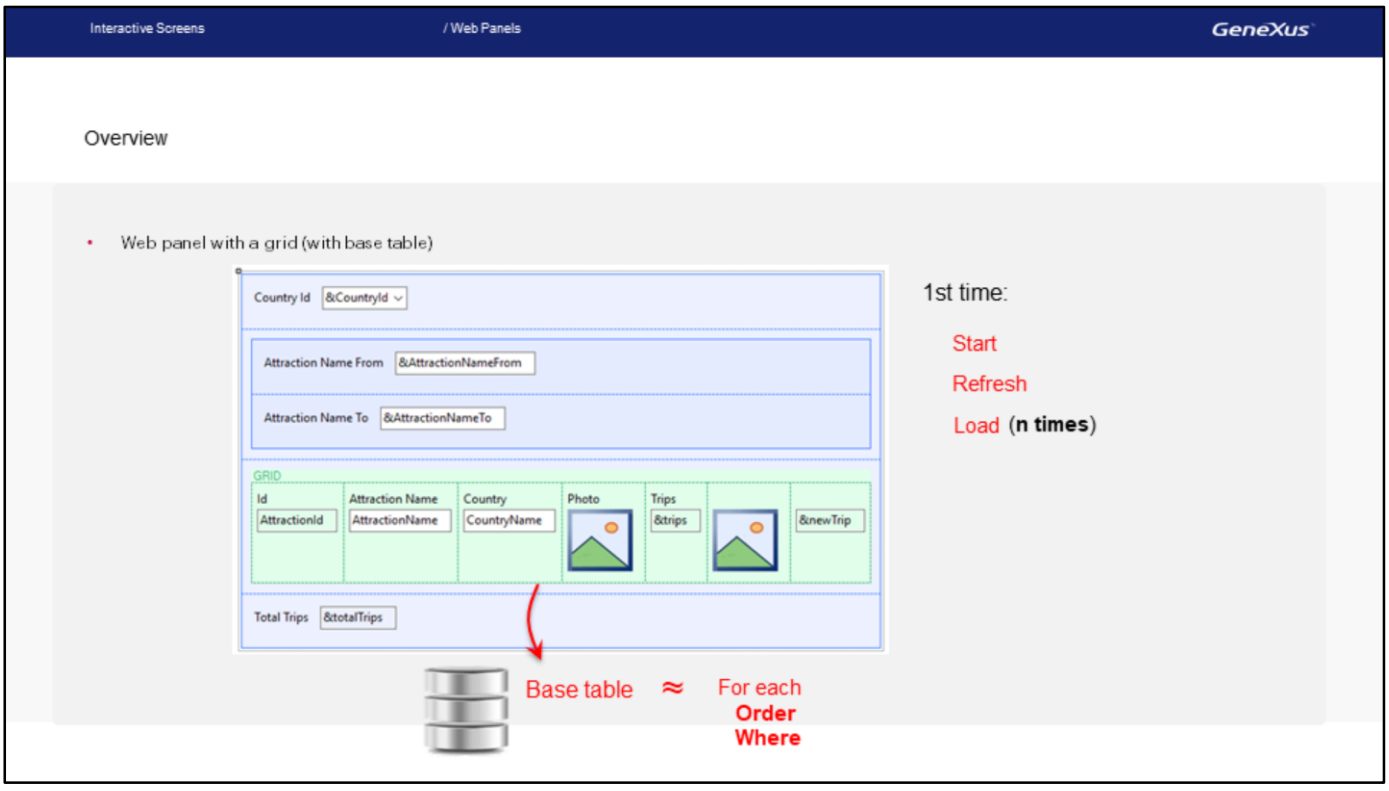


What we will have to do then is to program, inside the **Load event**, the access to the Attraction table with a For each, where we will specify the order clauses, and, in the Where clauses, the conditions that the data must fulfill. And for each record compliant with those filters we will load the grid variables with the values of that attraction. When all the variables are loaded we then write the Load command to add a line in the grid with those values.

Web panels without base table



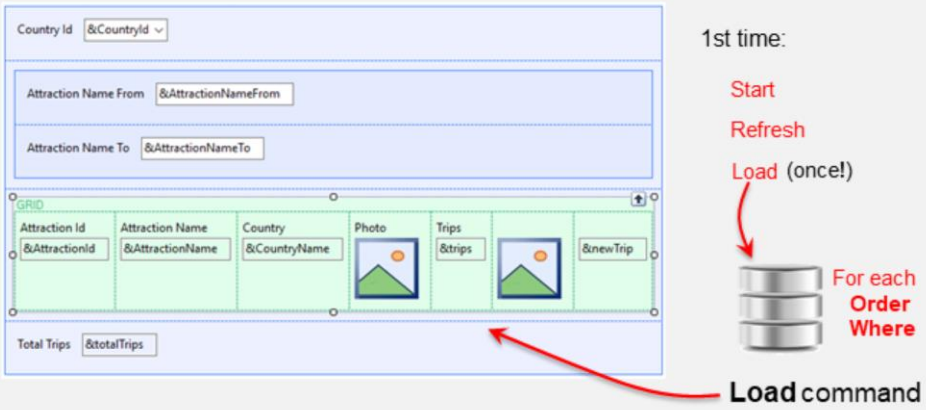
If we note the navigation listing of the web panel without base table... We can see the For each in the Load, indicating the navigation.



When we had the web panel with a base table, upon opening the web panel, the Start event was executed, followed immediately by the Refresh, and then we accessed the base table automatically, filtering pursuant to the grid conditions and sorting according to the attributes indicated in the grid's Order property. We consider this as a sort of implied For each that GeneXus places there internally, without the need for the developer to do anything at all. And for each record to be loaded as a line in the grid, prior to doing it, the Load event is executed. This is why the **Load** event is triggered, in this case **as many times as there are lines to be loaded in the grid**.

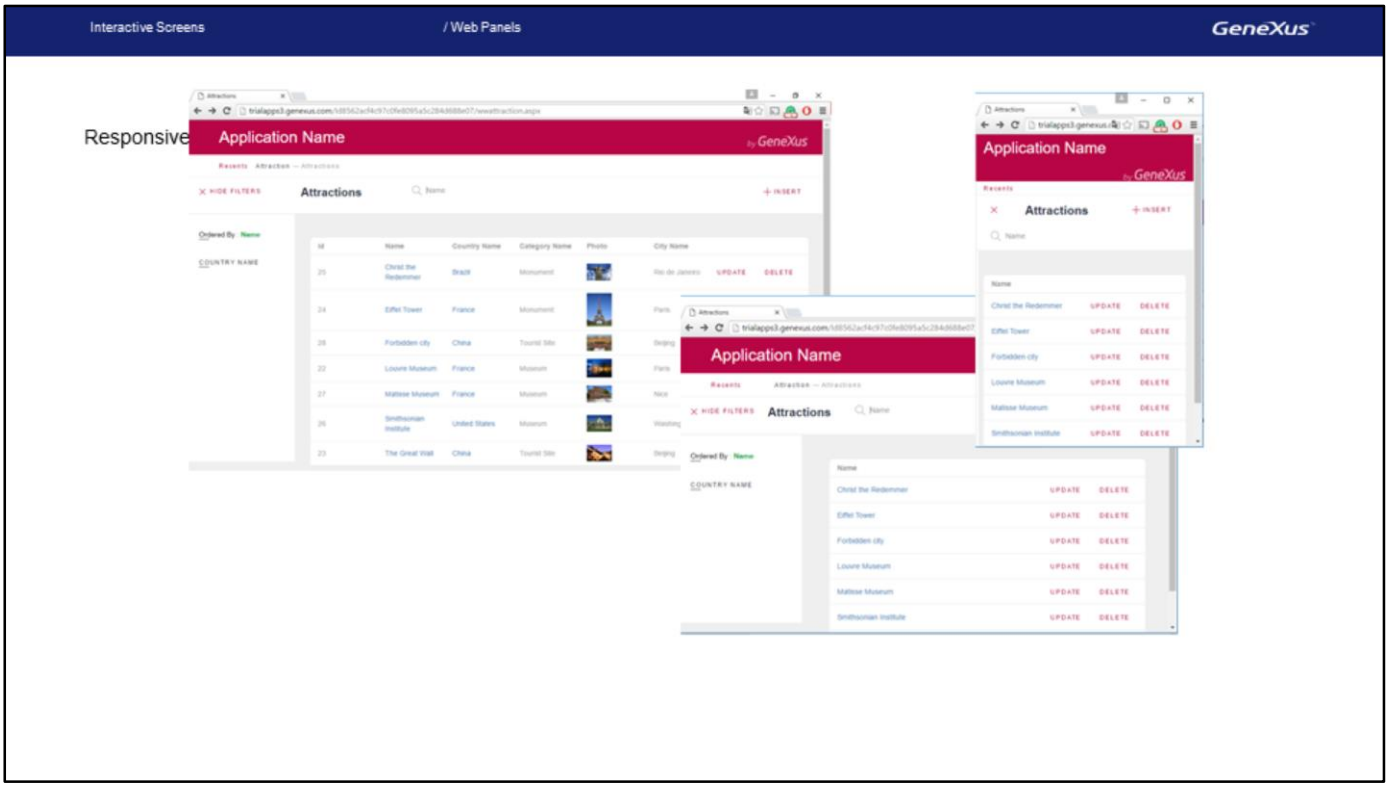
Overview

- Web panel with a grid (without base table)



On the other hand, when the web panel has no base table, the grid only has variables and there is no implied For each.

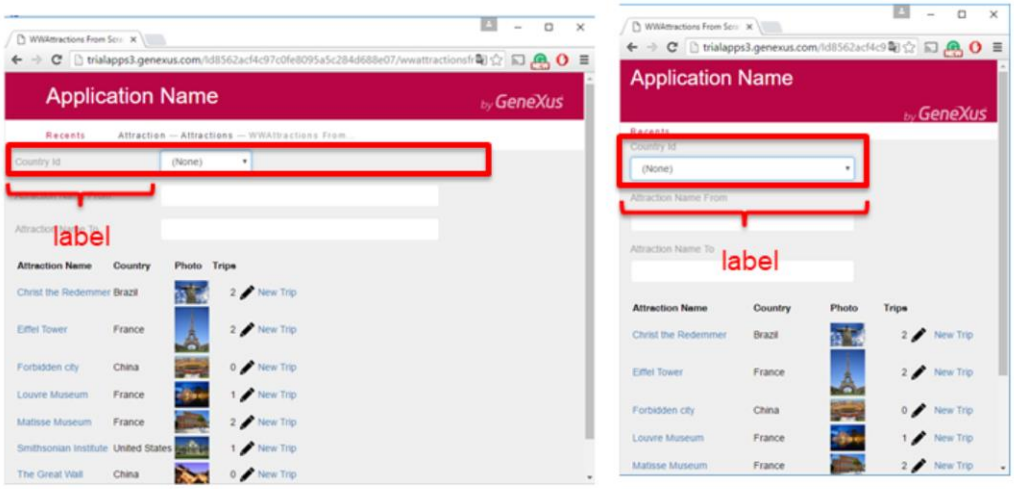
When we open the web panel the Start event is executed just like before, and so is the Refresh, while the Load is executed only once. When we need to go to the database to retrieve information, we must do it explicitly inside this event. In other words: we must write the For each and use the Order and Where clauses there. In order to load each line, we must do it explicitly with the **Load command**, for each one of them.



To end this, we should not that the applications designed by GeneXus do an auto-adjustment of the information shown on screen according to the size of the screen. For instance, if we execute the Work With Attractions created by the pattern, we are executing on a browser that occupies the full screen of a notebook.

But let's see what happens when we make the browser screen smaller. If we make it smaller from the right...we will see that there comes a time when the grid shows only the name of the attraction and the actions. And if we make it even smaller we no longer see the left column. This is how it will appear on a mobile phone executing the application from its browser.

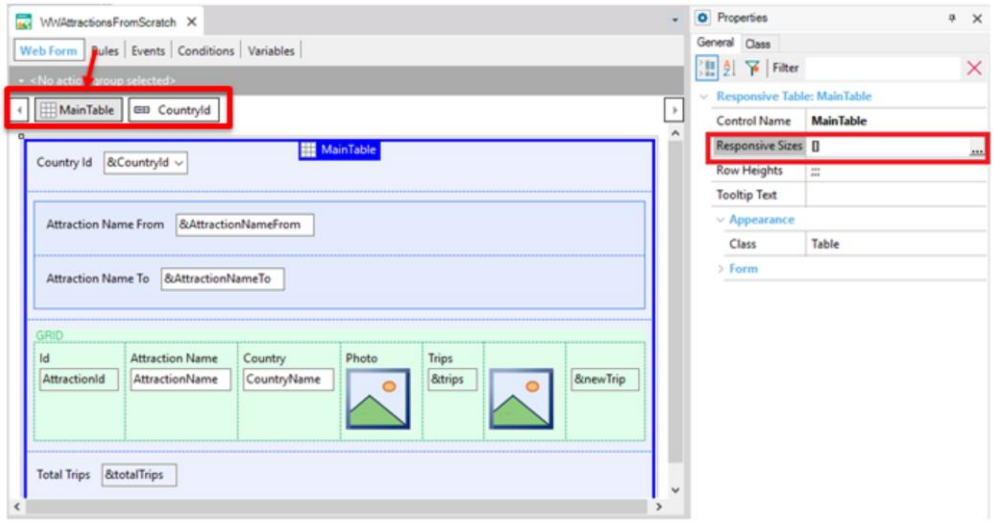
Responsive Web Design



If we now go to our Work With developed from scratch, we will see that even when we did nothing, it does have a slight self-adjustment.

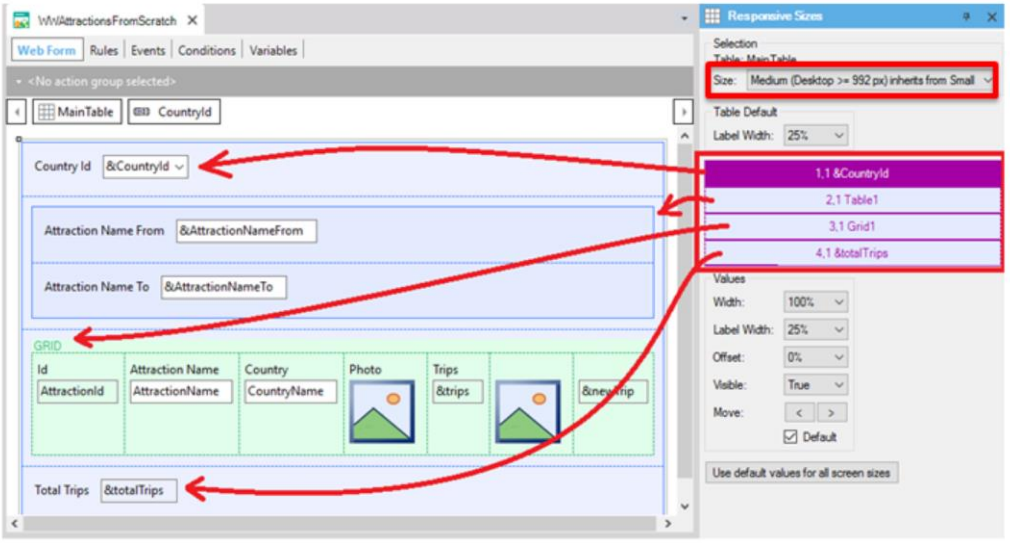
If we take a look at the variables on top, we will note that they have the label on the left and occupy a given width prior to the start of their own variable control
where they then have the label on top, occupying the whole width.

Responsive Web Design



To achieve this behavior, web objects use responsive tables. We will not be considering that topic in this course, but if we go to our web panel and stand inside the form in the Country Id control we will see that here on top it shows the table control inside the one that it is inserting. It is the main table. If we click on it, we will see that the properties of this table include the **Responsive Sizes** property relating to the "responsive" sizes. And if we click here...

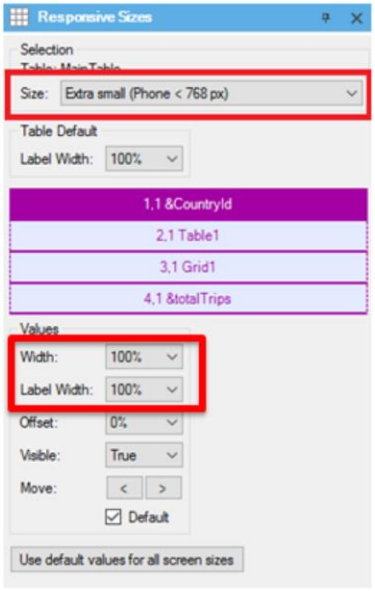
Responsive Web Design

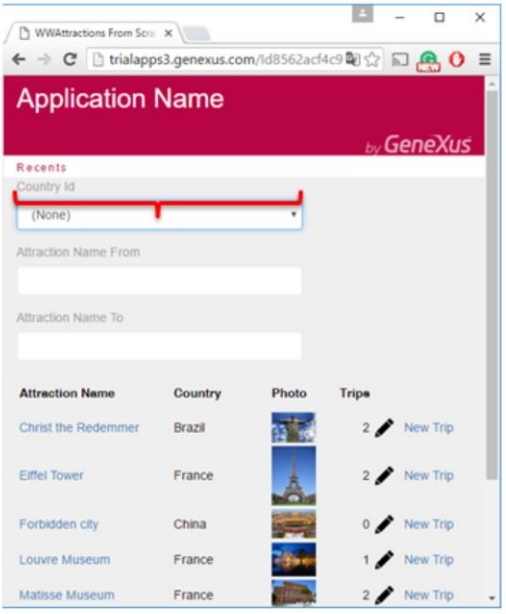


..., this screen will be edited. We will note that it has the controls inserted in the main table. In turn, some of them, like this table (the one with the &AttractionNameFrom and &AttractionNameTo variables) or like the grid, have controls inside as well.

And we also have a combo enabling us to select screen sizes. We now have the Medium size, but if we select Small or Extra Small...

Responsive Web Design

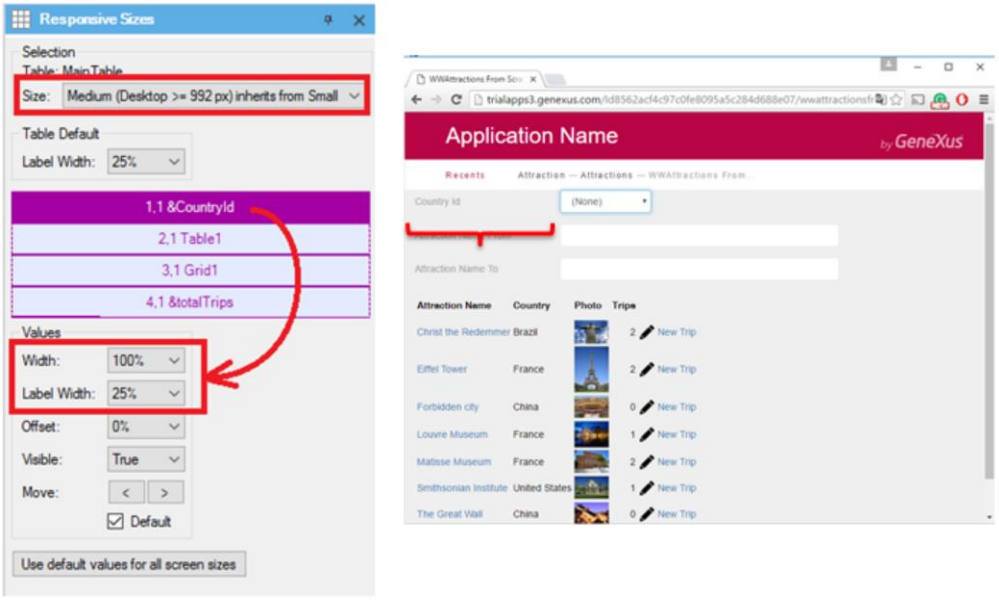




...we will see that the values change.

We should particularly note that for &CountryId on an Extra small screen we will have the label occupying the whole width, and the variable control itself will occupy the remaining 100%. And that is why we viewed the label over the variable in runtime.

Responsive Web Design

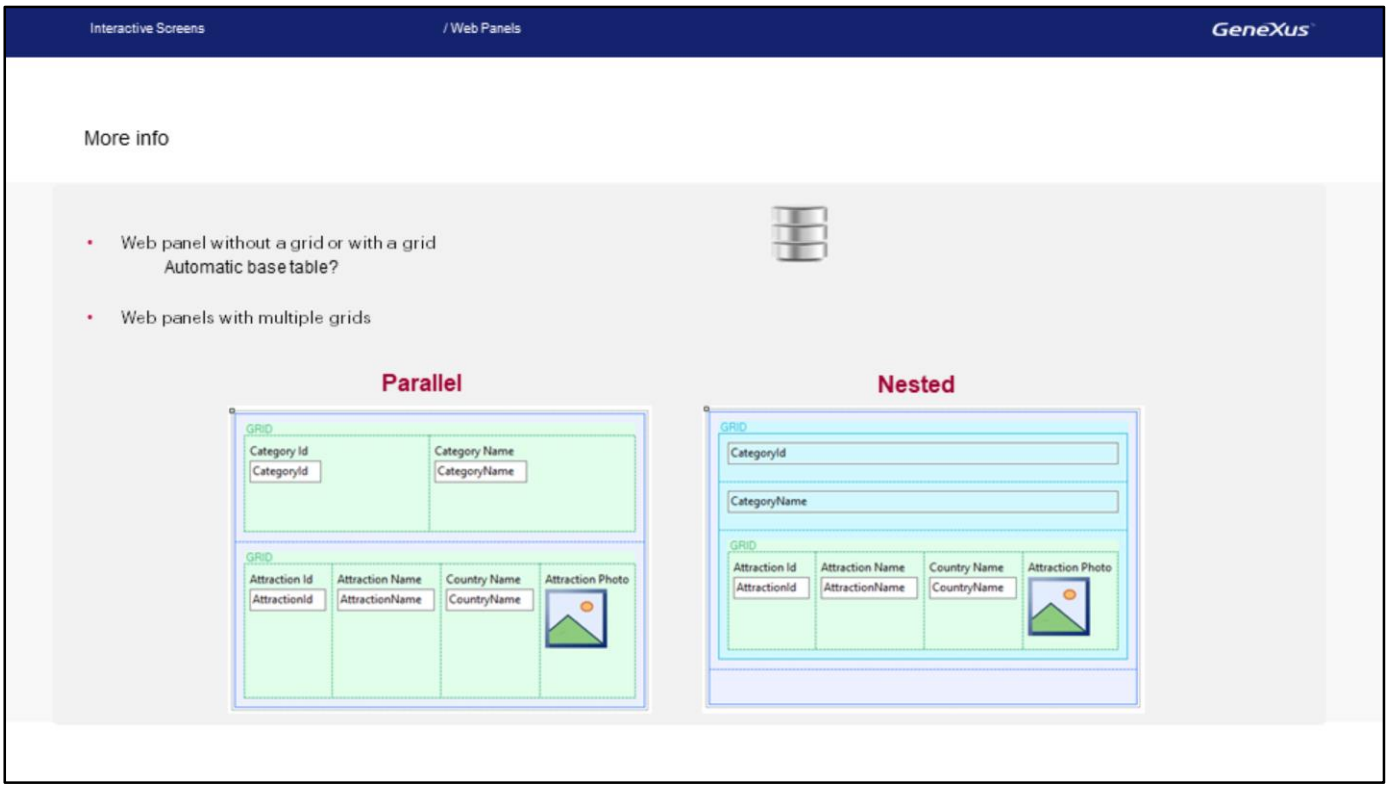


If we now select the Medium size we will see that the label occupies 25% of the width, and the variable control per se occupies the remaining size to 100%.

This is in line with what we saw in runtime. We should also note that we have the Visible property to hide certain controls for specific screen sizes.

This enables us to manage controls in order to self-adjust what is shown in runtime, according to the size of the screen on which the form is deployed on different instances.

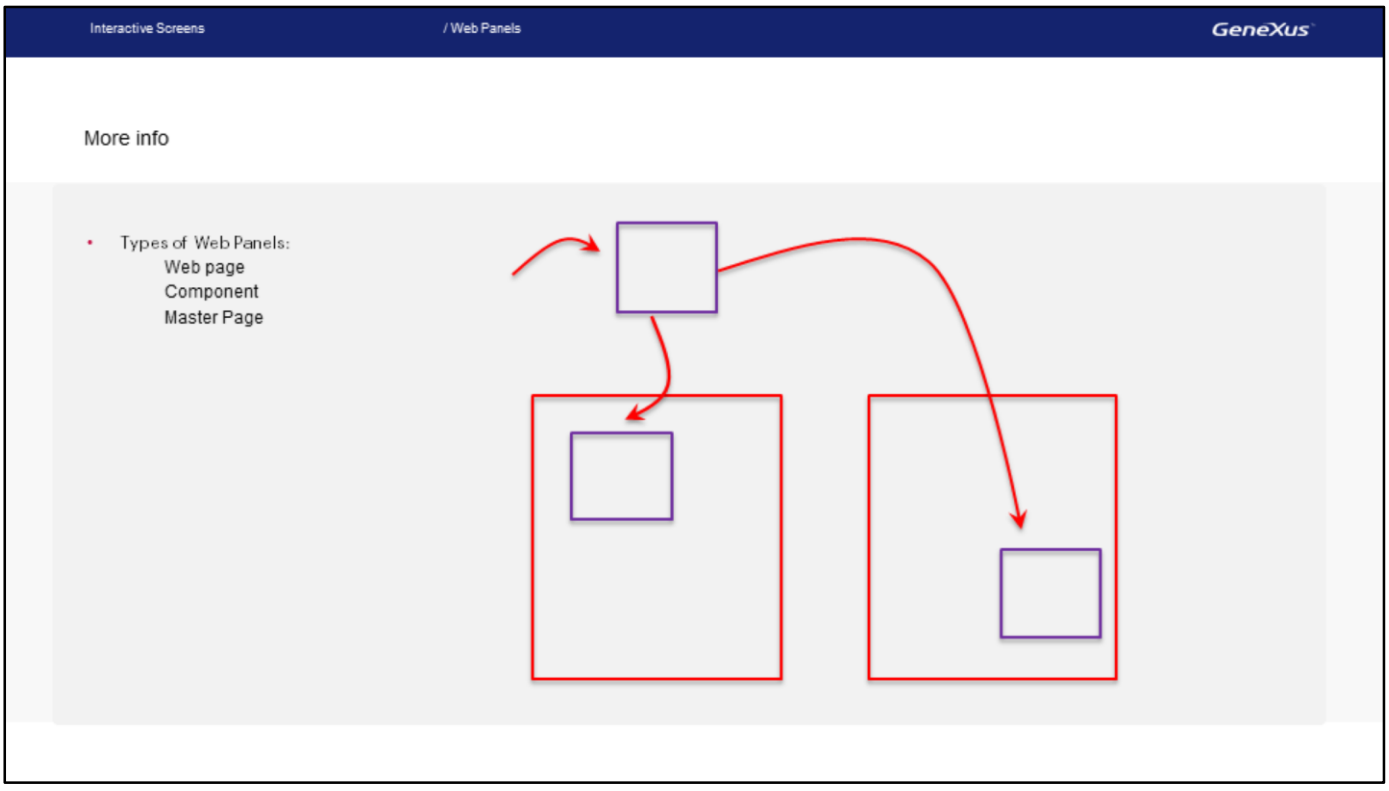
This is called Responsive Web Design, which we will must mention by way of introduction for the time being.



There is a lot more to learn about web panels.

For example, when the web panel has no grids or when it only has one, where exactly does GeneXus find attributes to determine whether it associates an implied base table or not? And when attributes appear there, what is the criteria they should abide by? Even when we might suspect that they are the same than in the case of a For each: they must belong to the extended table.

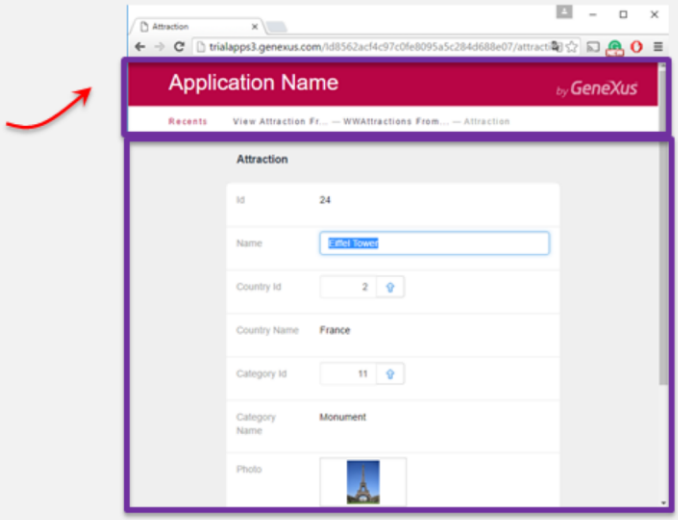
It is possible to implement web panels with multiple grids, either parallel or nested. It is similar to having parallel or nested For eachs.



There are three types of web panels. These vides have shown us only the web page type, but there are web panels that may be defined as components for cases where we need to repeat a part of a page in multiple web panels. When we define it as component we can insert it in other objects with web screen.

More info

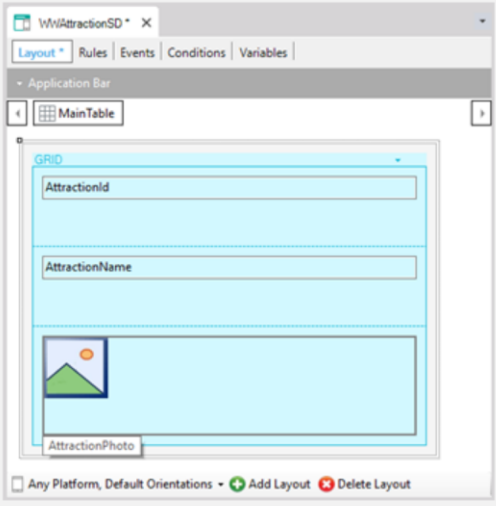
- Types of Web Panels:
  - Web page
  - Component
  - Master Page



We also have web panels defined as master pages. All KBs are created with master pages which constitute the framework in which all pages executed are loaded. Here we can see on top, that the transaction is part of the master page of the application. The transaction screen opens up in the area meant for that in the master page.

More info

- Panels for Smart Devices



And last, we should mention that, for developing mobile apps for smart devices, we also have panels, called Panels for Smart Devices. In an upcoming video we will have an introduction to this type of applications.

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