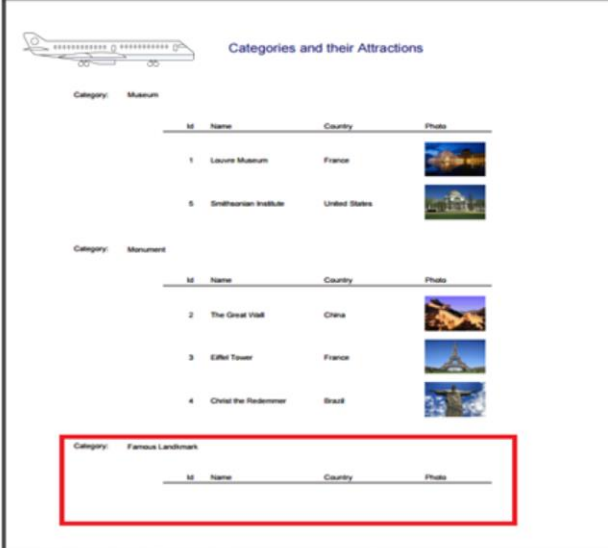


How to list grouped information

Nested For eachs



GeneXus™ 16

Listing grouped information






Categories and their Attractions

Category: Museum

M	Name	Country	Photo
1	Leuvre Museum	France	
5	Smithsonian Institute	United States	

Category: Monument

M	Name	Country	Photo
2	The Great Wall	China	
3	Eiffel Tower	France	
4	Christ the Redeemer	Brazil	

Category: Famous Landmark

M	Name	Country	Photo
---	------	---------	-------

- This was the listing of categories with its attractions.
- The Famous Landmark category does not have any attractions at the moment.
- What if now we don't want to list ALL the categories, but rather only the ones that have attractions?

In the previous section we saw a list requested by the travel agency that showed all the tourist attraction Categories. For each category, it showed the list of attractions that had been entered.

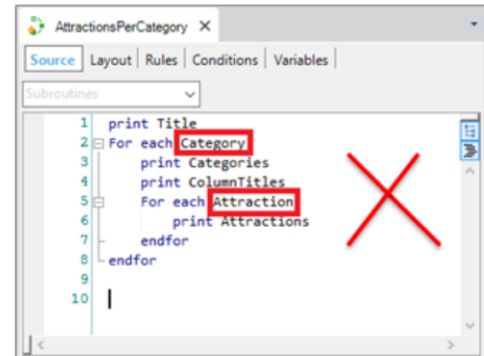
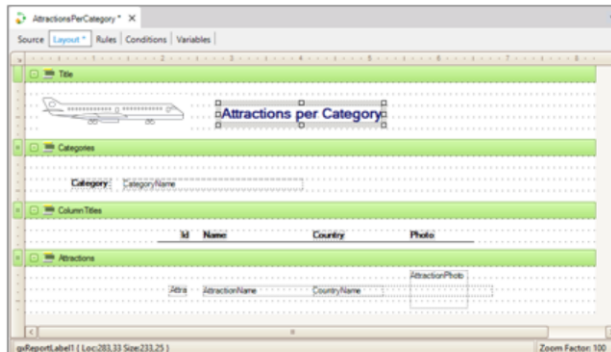
Let's change the category of "The Great Wall" attraction, so that "Famous Landmark" no longer has an associated attraction.

Now we execute the list again.

As we can see, this list shows ALL the categories that have been entered, even those that don't have associated attractions.

If this is not what we want, that is to say, if we want to show only the categories that have attractions. What do we do?

¿Why can't we use the previous solution?



CategoryId	CategoryName
1	Museum
2	Monument
3	Famous Landmark

AttractionId	AttractionName	CategoryId	...
1	Louvre Museum	1	
5	Smithsonian Institute	1	
2	The Great Wall	2	
3	Eiffel Tower	2	
4	Christ the Redemmer	2	

3?

We will implement this in another procedure. To do so, we save the one we had with another name. And let's change the text block's title.

If we examine the For Each commands that we had implemented, we can see that the base table of the external For Each command is Category, and the base table of the nested For Each command is Attraction.

But in this way, we first access the Category table; next, the record data is printed and finally the nested For Each command is executed. As a result, the category will be printed before we know if it has related attractions or not.

This is not what we need. We need to access the **attractions' categories** because it is the only way to make sure that the category to be printed has at least one attraction.

Solution

Foreign Key					Primary Key	
AttractionId	AttractionName	CountryId	CategoryId	...	CategoryId	CategoryName
→ 1	Louvre Museum	2	1		1	Museum
→ 5	Smithsonian Institute	4	1		2	Monument
→ 2	The Great Wall	3	2		3	Famous Landmark
→ 3	Eiffel Tower	2	2			
→ 4	Christ the Redemmer	1	2			

Category: Museum

1	Louvre Museum	France
5	Smithsonian Institute	United States

Category: Monument

2	The Great Wall	China
3	Eiffel Tower	France



```

For each Attraction
  print Categories
  For each Attraction
    print Attractions
  endfor
endfor

```

order CategoryId

Grouping or 'break' criterion

Break control

The idea is to group the attractions in the Attraction table by category, and then go over those groups, printing the category for each of them, for which we will have to access the Category table in order to recover its name. In addition to printing each attraction in the group.

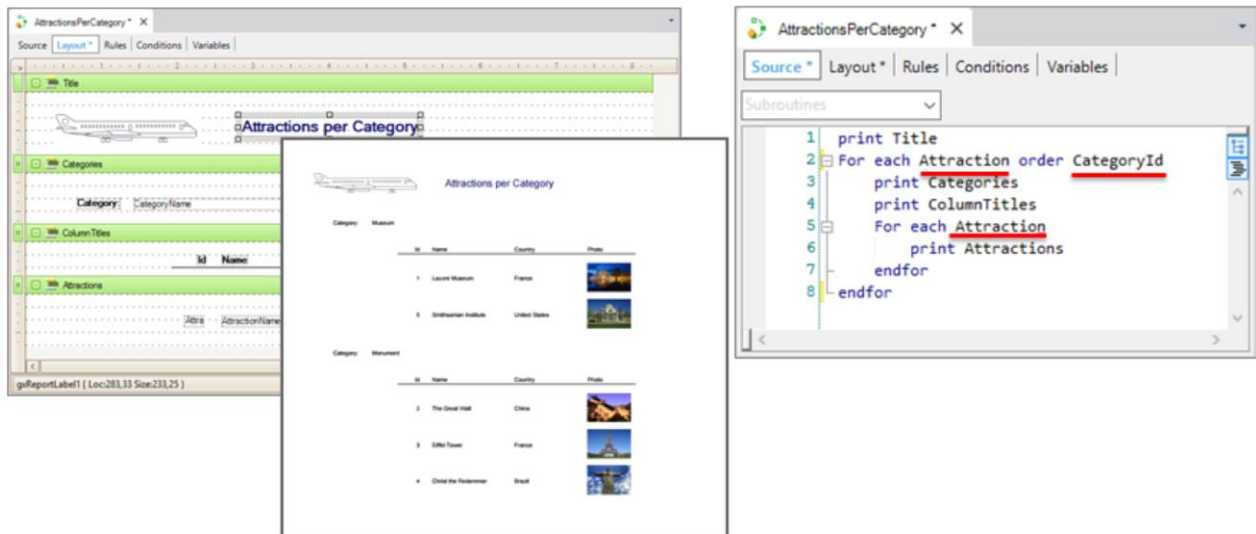
To then move on to the next group ... and so on.

In sum, what we must do is go over the Attraction table only, first grouping it by category and printing the category, and then printing, from each category group (obviously by navigating the same Attractions table) the attractions in it.

Note that the way in which we instruct GeneXus that the grouping is to be done by CategoryId is by specifying the Order clause.

This case of nested For eachs that go over the same table is known as **control break**.

Listing grouped information: control break



The screenshot displays the GeneXus IDE interface for a report titled "Attractions per Category". The left pane shows the layout structure with sections for Title, Categories, ColumnTitles, and Attractions. The right pane shows the subroutines code.

Layout Structure:

- Title
- Categories
 - Category: CategoryName
- ColumnTitles
 - Id Name
- Attractions
 - Id Name

Subroutines Code:

```

1 print Title
2 For each Attraction order CategoryId
3   print Categories
4   print ColumnTitles
5   For each Attraction
6     print Attractions
7   endfor
8 endfor
  
```

The output of the report is shown in the center, displaying a table of attractions grouped by category. The categories are Museum and Monument.

Category	Museum		
Id	Name	Country	Photo
1	Lucas Museum	France	
2	Smithsonian Institution	United States	
Category	Monument		
Id	Name	Country	Photo
3	The Great Wall	China	
4	Eiffel Tower	France	
5	Christ the Redeemer	Brazil	

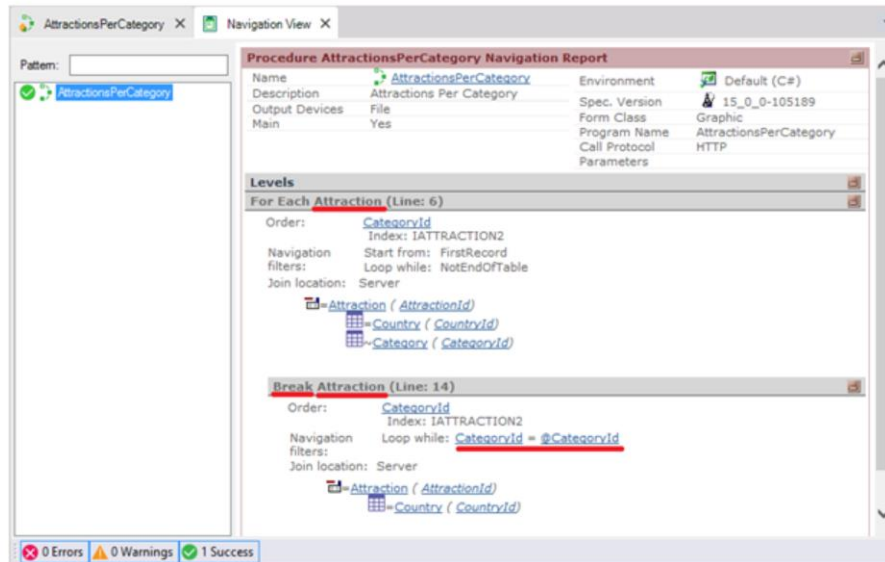
Let us now do the changes in our procedure...

First we change the transaction of the external For each, and use Attraction...

Then we add the Order clause, to sort by CategoryId, which in the case of the control break will also apply to something more significant: for **grouping** by that attribute.

We run it. Note that the "Famous Landmark" category, which doesn't have any attractions, is not being listed.

Listing grouped information: control break



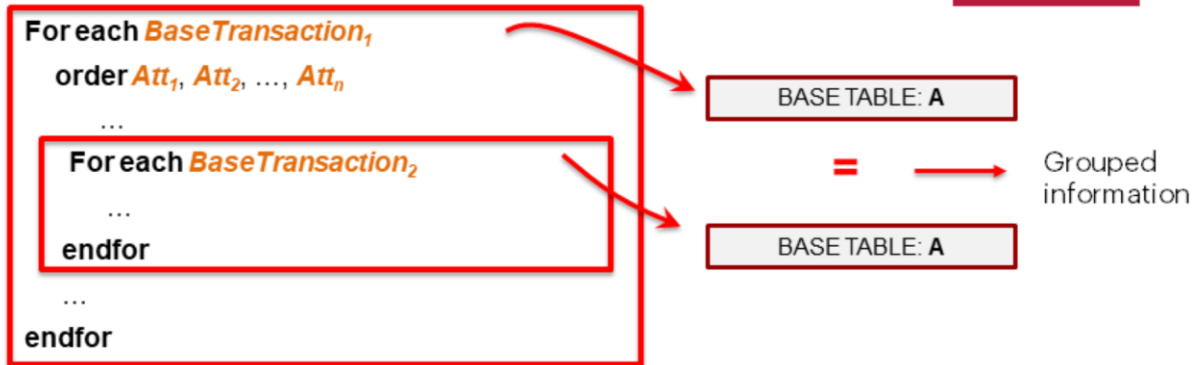
If we consider the resulting navigation list, we will see that it informs us about a For each to the Attraction table, ordered by CategoryId, which will be broken (Break) by the nested For each on the same table: Attraction. Note that in this break only the attractions in the category of that group are run through.

Conceptualization

- Break the information by some criteria

✓ Same base table for all

Break control



So let's now conceptualize the definition of a control break.

It relates to nested For eachs ... With the same base table for all the For eachs...

Conceptualization

- Break the information by some criteria

✓ Break criteria:
order clause

For each *BaseTransaction₁*

order *Att₁, Att₂, ..., Att_n*

...

For each *BaseTransaction₂*

...

endfor

...

endfor

Break criteria

BASE TABLE: A

Grouped by...



And the Order clause to establish the break criteria.

Summary

Summing up

- Listings
- ✓ Layout
- ✓ Source

For each
command



In these videos we have seen how GeneXus facilitates the determination of simple listings (that navigate a single table) or more complex listings that navigate information in several related tables (join), or in the same table, but grouped by some particular criterion (control break).

The command that we use in all cases for accessing the database is the **For each**.

Summing up

- Listings
- ✓ Layout
- ✓ Source



Attractions List

Id	Name	Country	Photo
1	Louvre Museum	France	
2	The Great Wall	China	
3	Eiffel Tower	France	

**For each
command**

Simple For each

1

For each **BaseTransaction**
 order *Att₁, Att₂, ..., Att_n*
 where *condition₁*
 where *condition₂*
 ...
 where *condition_n*
 MainCode
 endfor

In the first case, we used a simple For each, where we inferred the table to be navigated through its Base Transaction.

Summing up

- Listings
- ✓ Layout
- ✓ Source

For each
command

2

Category	Monument	Monument
id	Name	Country
1	Louvre Museum	France
2	British Museum	United States

Category	Monument	Monument
id	Name	Country
3	The Great Wall	China
4	Eiffel Tower	France
5	Clifford Tower	United States

Category	Monument	Monument
id	Name	Country
6	Clifford Tower	United States

Nested for eachs

2

For each **BaseTransaction**
 order **Att₁, Att₂, ..., Att_n**
 where **condition₁**
 where **condition₂**
 ...
 where **condition_n**

1

≠

N

For each **BaseTransaction**
 order **Att₁, Att₂, ..., Att_n**
 where **condition₁**
 where **condition₂**
 ...
 where **condition_n**

endfor

endfor

Join

In the second case we have a pair of nested For eachs, where, from different base transactions we discover a relation of one to many amongst the information of each For each.

Summing up

- Listings
- ✓ Layout
- ✓ Source

For each command



Attractions per Category

Category	ID	Name	Country	Photo
Museum	1	Louvre Museum	France	
	5	Smithsonian Institute	United States	
Monument	2	The Great Wall	China	
	3	Eiffel Tower	France	
	4	Christ the Redeemer	Brazil	

Nested For eachs

3

For each BaseTransaction
 order Att₁, Att₂, ..., Att_n
 where condition₁
 where condition₂
 ...
 where condition_n

=

For each BaseTransaction
 order Att₁, Att₂, ..., Att_n
 where condition₁
 where condition₂
 ...
 where condition_n

endfor

endfor

Break control

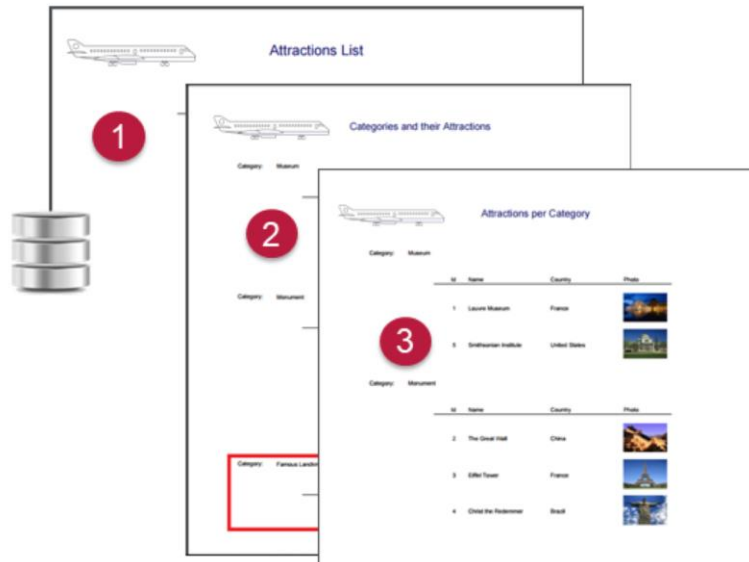
While in the third case we also have a couple of nested For eachs, but in this case their base transactions **are the same**. GeneXus then understands that we want to “break” or “group” the information from **the** table that is to be run through, by the attribute or the group of attributes specified in the Order clause of the external For each.

And more...

- Listings
- ✓ Layout
- ✓ Source

comando
For each

- Panels
- Query object



Further ahead we will see other mechanisms to implement queries to the database for obtaining information in a flexible and appealing manner.



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