Database update

Business Components. Update or Insert (batch) and Data Provider

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Insert, Update, Delete



Database Update Business components. Rules, events and checks. Review part 2

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Focusing on a KB for a health care service, in previous videos we analyzed how to insert, update, and delete through the Business Component of a two-level transaction.

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····	 OfficeId OfficeVisitLastNumber 	Id Number		Office Id Office Visit Last Number
	들 Patient	Patient		Patient
	PatientId	Checks	Error Id	Error Description
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	OfficeVisitPatientNum	<pre>error("Physician " + PhysicianId.ToString() +" already has 2 shifts assigned for the date: "</pre>	PhysicianNotAvailable	Physician already has 2 shifts
	-	FK: Shiftid	ForeingKeyNotFound	No matching 'Shift'
		FK: OfficeId	ForeingKeyNotFound	No matching 'Office'
CK: {OfficeVisitDate, Shiftid, C		CK: {OfficeVisitDate, Shiftid, OfficeId}		Office Visit Date, Shift Id, Office Id already exists
PK: (OfficeVisitDate, Physicianid,		PK: (OfficeVisitDate, PhysicianId, Shiffid)	DuplicatePrimaryKey	Record already exists
		FK: Patientid	ForeingKeyNotFound	No matching 'Patient'
		<pre>error("Hhere is a pending office visit scheduled for this patient for the same specialty", PatientAlreadyScheduledForMedicalSpecialty) if not fixed numert invel PatientId;</pre>	PatientAlreadySchedule dForMedicalSpecialty	There is a pending office visit scheduled
		PK: (OfficeVisitDate, PhysicianId, Shiftid, Patientid)	DuplicatePrimaryKey	Record already exists

In those videos, starting from the two-level OfficeVisit transaction, which had a series of declared rules, in particular some error rules, what we tested was to insert an office visit with a patient, update an office visit (changing the office and modifying a line, deleting one and adding another) and deleting an office visit through a Business Component variable.



Now we want to assign in batch mode the office visits for a given physician in the week following a given date, in his or her preferred office.

For example, for doctor 1, office 1, we will want this office visit schedule: Monday, Wednesday and Friday in the shift chosen for those days, for example, 1.... Tuesdays and Thursdays on the next shift, 2.... And Tuesdays and Thursdays, in the remaining shift, shift 3...



Monday	Tuesday	Wednesday	Thursday	Friday
Physician: 1 Office: 1		Physician: 1 Office: 1		Physician: 1 Office: 1
	Physician: 1 Office: 1		Physician: 1 Office: 1	
	Physician: 1 Office: 1		Physician: 1 Office: 1	
10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022

Basically, we will only want to assign the office visits without patients; that is to say, only the records corresponding to the 7 headers of the transaction, meaning that we will work on the OfficeVisit table, complying with all the checks and rules of the transaction, so we will do it with a business component.



Monday	Tuesday	Wednesday	Thursday	Friday
Physician: 1 Office: 1		Physician: 1 Office: 1		Physician: 1 Office: 1
	Physician: 1 Office: 1		Physician: 1 Office: 1	
	Physician: 1 Office: 1		Physician: 1 Office: 1	
10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022

For example, using a single variable, filling in the required data for the first record and applying the Insert method to it; then clearing it and doing the same for the following office visit, on Wednesday: that is, loading the data and applying Insert...And so on...

We clear, load the data for Friday, shift 1... insert. We clear, load data for Tuesday, shift 2... insert. We clear, load data for Thursday, shift 2... insert. We clear, load data for Tuesday, shift 3... insert. We clear, load data for Thursday, shift 3... insert.

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Next Monday Form Date &NextScheduleDate Weekly Schedule						
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Id Type Description						
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Here we implement the requirement with a Web Panel where we ask the user for the data (here we will show the resulting message collection) and in the event... we first clear the message collection that would have been shown in a previous execution, call this proc that returns for this date, the date of the following Monday.

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And instead of asking 7 times for memory for the variable, assigning the corresponding elements for each one, and doing Insert, we choose to use the repetitive structure "for" to write the insertion only once for Monday, Wednesday and Friday, where only the day changes, and everything else is kept...

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...Then another one for Tuesday and Thursday, which is the following shift (calculated with this proc), and here we assign it...

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...and then another "for," also for Tuesday and Thursday, but in the remaining shift.

Note that in addition to improving the code, in short what we are doing is use a BC variable, assigning it the header values, and using the Insert method to try to insert in the corresponding table.



Then we process the messages obtained.

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Let's try this when there are no office visits yet in the table.

Of course, if we enter nonexistent foreign key values—for example, a nonexistent doctor—the insertion attempts will all fail. The insertion will be attempted by doing the same checks as through the transaction.

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SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/14/22 Shift morning	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/11/22 Shift intermediate	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/13/22 Shift intermediate	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/11/22 Shift evening	

Now let's see the successful path.

S GeneXus Developer Menu X	Office Visits	× S Office	e Visits Schedule 🛛 🗙	+			~	- 0 ×
← → C △ apps5.genexu	us.com/Id9df182c7035	Monday	Tuesday	Wednesday	Thursday	Friday	É	> 🖈 🗖 🅵 E
Hospital Back	office	Physician: 1 Office: 1		Physician: 1 Office: 1		Physician: 1 Office: 1		by GeneXus
Recents Office Visit —	Office Visits Sche.		Physician: 1 Office: 1		Physician: 1 Office: 1			
× HIDE FILTERS	Office Visits		Physician: 1		Physician: 1			+ INSERT
MEDICAL SPECIALTY NAME								
	Vi	sit Date Physic	ian Id Physician Name	Shift Name arr	Medical Specialt	Office Id	Last Number	
OFFICE VISIT DATE		10/10/22	1 Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE
SHIFT NAME		10/12/22	1 Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE
		10/14/22	1 Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE
		10/11/22	1 Doctor 1	Shift intermediate	Family Medicine	1	0 UPDATE	DELETE
		10/13/22	1 Doctor 1	Shift intermediate	Family Medicine	1	0 UPDATE	DELETE
		10/11/22	1 Doctor 1	Shift evening	Family Medicine	1	0 UPDATE	DELETE
		10/13/22	1 Doctor 1	Shift evening	Family Medicine	1	0 UPDATE	DELETE



&officeVisits.Insert()

Monday	Tuesday	Wednesday	Thursday	Friday
Physician: 1 Office: 1		Physician: 1 Office: 1		Physician: 1 Office: 1
	Physician: 1 Office: 1		Physician: 1 Office: 1	
	Physician: 1 Office: 1		Physician: 1 Office: 1	
10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022

Another way to program this would be to load each BC into an item in a collection, and then give the Insert order to the entire collection.

We know that internally each item will be accessed and an Insert of that item will be attempted.

GeneXus





That is to say, we would define an officeVisits variable, collection of the OfficeVisit BC.

And we would load the information in the &officeVisit variable, but instead of already inserting in the database, we would ask to add the BC to the collection, for all the BC instances.

And only later we would ask for the insertion of the entire collection.

Of course, here if we want to get the messages of each Insert (that of each item) we will have to run through the collection and call the subroutine.

And we should clear the BC collection before we start.

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Next Monday Form Date	10/04/22		Weekly Schedule		
Physician Id	1				
Most Frecuent Shift Id	1				
Usual Office Id	1				
ld		Туре		Description	
		Info		10/10/22 Shift morning	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/12/22 Shift morning	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/14/22 Shift morning	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/11/22 Shift intermediate	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/13/22 Shift intermediate	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/11/22 Shift evening	

If we try now with the empty table as before, it should give exactly the same result...



Wouldn't it be simpler to do it using a Data Provider instead of loading the collection manually?

That is to say, replace all this...



... with an invocation to this Data Provider, which returns a collection of the OfficeVisit BC...



...loaded in the same way as in the web panel event, but at a higher level.

Then we load the collection variable with the result of the invocation to the Data Provider, to which we must pass all the parameters.

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Hospital B	ackoffice				by GeneXuš
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Next Monday Form Date	10/05/22 29		Weekly Schedule		
Physician Id	1				
Most Frecuent Shift Id	1		Ν		
Usual Office Id	1		νζ		
La .		Time		Description	
		Info		10/10/22 Shift morning	
SuccessfullvAdded		Warning		Data has been successfully added.	
		Info		10/12/22 Shift morning	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/14/22 Shift morning	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/11/22 Shift intermediate	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/13/22 Shift intermediate	
SuccessfullyAdded		Warning		Data has been successfully added.	
		Info		10/11/22 Shift evening	

Let's try it. Again, having cleared the table, we see that it gives exactly the same result.

parm(in: &OfficeVisitDate, in: &PhysicianId, in: &ShiftId, in: &OfficeId);



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	2 Filter			×	T
~	Data Provider: GetOffic	eVisit			_
	Name	GetOfficeVisit			roper
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	Expose as Web Service	False			
	Main program	False			
	Call protocol	Internal			
	Module/Folder	Root Module			
	Qualified Name	GetOfficeVisit			
	Object Visibility	Public			
	✓ Output				
	Infer Structure	No			
	Output	OfficeVisit			
	Collection	False			
	V Network				
	Connectivity Support	Inherit			
	Warning messages				
	Disabled warnings	spc0096 spc0107 spc0142			
	> Miscellaneous				
	Generate Object	True			

Of course, we can use the Data Provider to return a collection of Business Components as we did here, which we then assign to this collection variable, or to return a single one and do the Insert on that one.

For example, here we have this other Data Provider that will return a single BC, this one, OfficeVisit. Note that collection is set to False, and only one header is loaded according to the values received in the parameters.

Next Monday Form Dat	e &NextScheduleDate	Weekly Schedule		& Variables		
Physician Id & Physicia	nld	Schedule One		Standard Variables FirstDayOfWeek message	Date Messages.Message, GeneXus.Common	First Day Of W message
Most Frecuent Shift Id	&MostFrecuentShiftId			 messages MostFrecuentShiftId n 	Messages, GeneXus.Common Attribute:ShiftId Numeric(1.0)	messages Most Frecuent n
Usual Office Id &usua	lOfficeId			 NextScheduleDate nextShift officeVisit 	Date Attribute:ShiftId OfficeVisit	NextMondayDa next Shift office Visit
GRID			-	officeVisits PhysicianId	OfficeVisit Attribute:PhysicianId	office Visits Physician Id
ld &messages.item(0).ld	Type &messages.item(0).Type ~	Description &messages.item(0).Description		• usualOfficeId	Attribute:OfficeId	Office Id

```
Event 'Schedule One'
   &messages.Clear()
   &officeVisit = GetOfficeVisit(&NextScheduleDate, &PhysicianId, &MostFrecuentShiftId, &usualOfficeId)
   &officeVisit.Insert()
   Do "GetMessages"
   Commit
Endevent
```

Let's add a button that allows inserting a single office visit with the screen variables, with those values. Then we use the non-collection BC variable, &officeVisit, that we already have declared... and load it with what is returned by this Data Provider, to which we pass the screen variables as parameters.

The variable is indeed of the BC data type, not collection.

Then we simply ask it to insert in the database and process the messages, adding the Commit, of course.

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× HIDE FILTERS	Offic	ce Visits	Q Name						+ INSERT
MEDICAL SPECIALTY NAME									
_		Visit Date 🛆	Physician Id P	hysician Name	Shift Name	Medical Specialt	Office Id	Last Number	
OFFICE VISIT DATE		10/10/22	1 D	loctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE
SHIFT NAME		10/11/22	1 D	loctor 1	Shift intermediate	Family Medicine	1	0 UPDATE	DELETE
		10/11/22	1 D	loctor 1	Shift evening	Family Medicine	1	0 UPDATE	DELETE
		10/12/22	1 D	loctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE
		10/13/22	1 D	loctor 1	Shift intermediate	Family Medicine	1	0 UPDATE	DELETE
		10/13/22	1 D	loctor 1	Shift evening	Family Medicine	1	0 UPDATE	DELETE
		10/14/22	1 D	octor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE

Let's try it. For example, for a date prior to this first one...

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Most Frecuent Shift Id	1				
Usual Office Id	1		ß		
14		Time		Description	
		iype		Description	Shift morning
		1110		10/00/22	
SuccessfullyAdded		Warning		Data has be	en successfully added.

...we insert successfully.

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X HIDE FILTERS	Office	e Visits	Q Name					+ INSERT
MEDICAL SPECIALTY NAME		Visit Date	Physician Id Physician Nar	ne Shift Name	Medical Specialt…	Office Id	Last Number	
OFFICE VISIT DATE		10/06/22	1 Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE
SHIFT NAME		10/10/22	1 Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE
		10/11/22	1 Doctor 1	Shift intermediate	Family Medicine	1	0 UPDATE	DELETE
		10/11/22	1 Doctor 1	Shift evening	Family Medicine	1	0 UPDATE	DELETE
		10/12/22	1 Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE
		10/13/22	1 Doctor 1	Shift intermediate	Family Medicine	1	0 UPDATE	DELETE
		10/13/22	1 Doctor 1	Shift evening	Family Medicine	1	0 UPDATE	DELETE
		10/14/22	1 Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE

Now, suppose that in case the record exists we would like to update it; for example, we place the same primary key, but we want to change the office.

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Next Monday Form Date	10/06/22		V	Veekly Schedule		
Physician Id	1		5	Schedule One		
Most Frecuent Shift Id	1		13			
Usual Office Id	2					
ld		Туре			Description	
		Info			10/06/22 Shift morning	
DuplicatePrimaryKey		Error			Record already exists	

Of course, a duplicate primary key error will occur, because we tried an Insert and the record already existed.



We can think, then, that to solve this we can just modify the method that we are invoking, changing it to InsertOrUpdate, so that it first tries to insert, and if it fails due to a duplicate key, then it tries to update.

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Recents Office \	Visits — Office Visits Sche					
Next Monday Form Date	10/06/22			Weekly Schedule		
Physician Id	1			Schedule One		
Most Frecuent Shift Id	1			5		
Usual Office Id	2					
		_				
		Туре			Description	
		Info			10/06/22 Shift morning	
SuccessfullyUpdated		Warning			Data has been successfully updated.	

If now we try again to change the office of this doctor's visit to number 2... we see that indeed it did what we wanted.

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MEDICAL SPECIALTY NAME										
_		Visit Date	Physician Id	Physician Name	Shift Name	Medical Specialt	Office Id	Last Number		
OFFICE VISIT DATE		10/06/22	1	Doctor 1	Shift morning	Family Medicine	2	0 UPDATE	DELETE	
SHIFT NAME		10/10/22	1	Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE	
		10/11/22	1	Doctor 1	Shift intermediate	Family Medicine	1	0 UPDATE	DELETE	
		10/11/22	1	Doctor 1	Shift evening	Family Medicine	1	0 UPDATE	DELETE	
		10/12/22	1	Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE	
		10/13/22	1	Doctor 1	Shift intermediate	Family Medicine	1	0 UPDATE	DELETE	
		10/13/22	1	Doctor 1	Shift evening	Family Medicine	1	0 UPDATE	DELETE	
		10/14/22	1	Doctor 1	Shift morning	Family Medicine	1	0 UPDATE	DELETE	

However, let's see what happens if we want to do the same but this time, for example, for this office visit, for this day in the intermediate shift, and doctor 1, who has another visit for the same day, in another shift...

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Next Monday Form Date	10/11/22 29			Weekly Schedule		
Physician Id	1			Schedule One		
Most Frecuent Shift Id	2					
Usual Office Id	2			ß		
ld		Туре			Description	
		Info			10/11/22 Shift intermediate	
PhysicianNotAvailable		Error			Physician 1 already has 2 shifts assigned for	or the date: 10/11/22

&officeVisit.InsertOrUpdate()

Then we place that day, doctor 1, shift 2 which is the intermediate shift and we want to change the office from 1 to 2.

Oops, why did we get this error indicating that doctor 1 already has 2 office visits assigned for that date?

It's because the Insert is tried first, and that's where this error is going to occur.

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Next Monday Form Date	10/11/22 29	Checks	Error Id	Error Description				
Physician Id	1	FK: PhysicianId	ForeingKeyNotFound	No matching "Physician"				
Most Frecuent Shift Id	2	<pre>error("Physician " + PhysicianId.ToString() +" already has 2 shifts assigned for the date: " + OfficeVisitDate.ToString(), PhysicianNotAvailable) if &shifts >> 2 and Insert;</pre>	PhysicianNotAvailable	Physician already has 2 shifts				
Usual Office Id	2	FK: Shiftld	ForeingKeyNotFound	No matching 'Shift'				
ld	INSERT	FK: OfficeId	ForeingKeyNotFound	No matching 'Office'				
		CK: {OfficeVisitDate, Shiftld, OfficeId}		Office Visit Date, Shift Id, Office Id already exists				
PhysicianNotAvailable		PK: {OfficeVisitDate, PhysicianId, Shitfld}	DuplicatePrimaryKey	Record already exists				

FK: PatientId

&officeVisit.Insert()

("There is a pending office visit scheduled PatientAlreadyScheduledForMedicalSpecialty) if not &IsOk and Insert

PK: {OfficeVisitDate, PhysicianId, ShiftId, PatientId}

Let's remember the order in which the checks are triggered: before checking the uniqueness of the primary key, it will first trigger the procedure that will calculate the number of shifts for that doctor, and if the result is 2 or more, the error rule will be triggered.

What proves interesting here is that the uniqueness of the record will never be checked. Why?

And there is something very important that should be known: due to performance reasons, and assuming an optimistic strategy, in most cases, the insertion is not supposed to fail due to dupe PK. Therefore, all checks will take place first, and then the database INSERT command will be sent to the DBMS. This means that the INSERT is sent only when these previous checks were successful. And upon trying the Insert, the DBMS may return the dupe key error. And only then we will know whether another record with that key already existed or not.

So, if any of these previous checks fails, for example, due to this error rule, there is no attempt for the Insert, and we cannot know, **either**, whether a record with that key already existed that would also cause the insertion to fail.

In this case, the Update is not attempted, because it is only executed if the Insert failed because of a duplicate key.



If we translate the logic of the InsertOrUpdate method to what happens in the background, it would be something like this:

The Insert is tried, and if it works, it continues with the code that comes after. If it doesn't work, only if it is caused by a duplicate primary key, the Update is tried, which may or may not work, of course.

But we have to bear in mind the behavior we have just described. That is, if the Insert fails due to something else prior to the actual attempt for insertion, since it is never known whether the record already existed, then it will never execute the Update.

The reverse method has not yet been implemented in GeneXus.

	UpdateOrInsert()			
&officeVisit. UpdateOrInsert () –		If not &officeVi for &messag if &me &off endfor	sit. Upd e in &of ssage.lo iceVisit	ate() ficeVisit.GetMessages() d = "PrimaryKeyNotFound" Insert()
		ld	Туре	Description
		PrimaryKeyNotFound	Error	Data with the specified key could not be found.

But it should be analogous, in the sense that the Insert should be tried only if the Update cannot be done because the record does not exist and not because of anything else.

Since we don't have this method yet, we can try the Update and if it fails for whatever reason, try the Insert anyway, knowing that if the failure was not because the key did not exist, then the Insert will inevitably fail.



Of course, we could also be more specific and try the Load method, and ask if it was successful or not, and then order an Update or an Insert, respectively.



If we want to be more efficient, we can search for the existence of the record with a Find formula, for example.

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&officeVisits.Clear() PhysicianId = &PhysicianId ShiftId = &ShiftId OfficeId = &OfficeId 4 > GeneXus ~ AnotherShift &officeVisits = WeeklySchedule(&NextScheduleDate, &PhysicianId, &MostFrecuentShiftId, &usualOfficeId) 6 7 -} > Customer &officeVisits.Insert() DeleteOfficeVisits for &officeVisit in &officeVisits Do "GetMessages" FirstDayOfWeek 1 GetOfficeVisit endfor Commit -Endevent Gx0010 Gx0020 Gx0030 Sub "GetMessages" Gx0040 14 &message = new()
&message.Type = MessageTypes.Info Gx0050 Gx0063 16 17 Gx0070 18 🕽 isPatientOk &messages.Add(&message) 19 MedicalSpecialty endfor 21 - endsub Office OfficeVisit 23 Event 'Schedule One' L Schewule vme Amessages.Clear() &officeVisit = GetOfficeVisit(&NextScheduleDate, &PhysicianId, &MostFrecuentShiftId, &usualOfficeId) &officeVisit.InsertOrUpdate() CfficeVisitsSchedule 24 GfficeVisitTEST 26 // Patient if find(OfficeId, OfficeVisitDate = &NextScheduleDate and PhysicianId = &PhysicianId and ShiftId = &MostFrect & officeVisit.Update() > 🔲 Physician PhysicianShifts Ι 29 else > 🔲 Shift &officeVisit.Insert() 30 HeeklySchedule endif 32 Do "GetMessages" 33 Commit 34 - Endevent WeeklyScheduleMocku L Domains 🔽 Images < < Backup Output 7 × References Autoscroll Customization Success: Execution Success: Run Developer Menu B KB Explorer HI Preferences Ln 31 Col 11 Ch 7 1/0/0/1 1/1 INS Models\GX17StableForu9\Hospital

Let's try this solution.

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Next Monday Form Date	10/11/22 29		We	ekly Schedule		
Physician Id	1		Sch	iedule One		
Most Frecuent Shift Id	2					
Usual Office Id	2					
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		Info			10/11/22	
SuccessfullyUpdated		Warning			Data has been successfully upda	ed.
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Now we were able to change the office.



Let's go back to the batch insertion. Previously we had inserted all these records without any problems because there were no other records for that week in the database. But what if they existed?



For example, let's suppose that these records already existed for that week, when we want to launch the batch process.

We will want to do the same as in the previous individual case: that is, insert if there is no record with that key and otherwise update.

So, what should happen with each one? For the first one, there already exists a record with that primary key, this one, so it will try the Update, which will work, changing the office for this one, number 1.

For the second one, it checks if there is a record with that key, and since it doesn't exist, it tries the Insert, but it will fail because of a duplicate candidate key. The reason is that office 1 is already used.

For the third one, it checks if there is a record with that key; it does not exist, so it tries the Insert, which will be successful.

For the fourth one, it tries the Insert, which will count how many office visits are already entered for that day for the doctor, and since it will give 1, no error will be triggered and it will be possible to insert without any problem.

For the fifth one the same thing will happen, it will insert without any problem. Now comes the sixth one and since there is already a record with that key, it tries the Update, which will be successful, modifying the office of the existing record. For the last one, since there is no record with that key, it will try the Insert, but it will fail. Why? Because it will find that doctor 1 already has 2 office visits scheduled that day.

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> is Beckup > Output > · · · · · · · · · · · · · · · · · ·	 Control Control C	<pre>1Event 'WeeklySchedule' Messages.Clear() & officeVisits. Clear() & officeVisits = WeeklySchedule(&MextScheduleDate, &PhysicianId, &MostFrecuentShiftId, &usualOfficeId) & officeVisits in & officeVisitate = &officeVisitDate and PhysicianId = &officeVisit.Physi & officeVisit.Update() = else & officeVisit.Update() = officeVisit.Update() = officeVisit.Update() = officeVisit.Update() = officeVisit.Update() = officeVisit.Update() = officeVisit.Update() = officeVisit.Update() = officeVisit.Update() = set = s</pre>	<pre>rect</pre>
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Hospital_ - GeneXus 17

How do we change the code we had to make it work like this?

It is no longer useful to launch a massive operation on the collection of the 7 items returned by the Data Provider. We will have to work individually, running through the entire collection and in each case checking for the existence of the record with that key. Here we must use the data of each BC.

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&officeVisits.Clear() PhysicianId = &PhysicianId ShiftId = &ShiftId 4 > 🦳 GeneXus AnotherShift &officeVisits = WeeklySchedule(&NextScheduleDate, &PhysicianId, &MostFrecuentShiftId, &usualOfficeId) 6 7 - } OfficeId = &OfficeId Customer &officeVisits.Insert()
for &officeVisit in &officeVisits
 if not &officeVisit.Update()
 &officeVisit.Insert() DeleteOfficeVisits FirstDayOfWeek 🔚 GetOfficeVisit 式 Gx0010 endif Do "GetMessages" 😨 Gx0020 💽 Gx0030 endfor Commit 🔂 Gx0040 14 Endevent Gx0050 Gx0063 16 Sub "GetMessages" Beressages Benessage = new() Benessage.Type = MessageTypes.Info Benessage.Description = &officeVisit.OfficeVisitDate.ToString() + " --- " + &officeVisit.ShiftName 17 Gx0070 18 isPatientOk 19 MedicalSpecialty &messages.Add(&message)
for &message in &officeVisit.GetMessages() 21 Office &messages.Add(&message) OfficeVisit endfor CfficeVisitsSchedule endsub 😨 OfficeVisitTEST 25 26∃Event 'Schedule One' Patient &messages.Clear()
&officeVisit = GetOfficeVisit(&NextScheduleDate, &PhysicianId, &MostFrecuentShiftId, &usualOfficeId) Physician 28 PhysicianShifts &officeVisit.InsertOrUpdate()
if find(OfficeId, OfficeVisitDate = &NextScheduleDate and PhysicianId = &PhysicianId and ShiftId = &MostFrecu 29 🔲 Shift 30 HeeklySchedule 31 &officeVisit.Update() 32 else WeeklyScheduleMocku 33 34 &officeVisit.Insert() L Domains endif 🔽 Images > < Backup E Output 7 × References + Autoscroll T Customization Success: Execution Success: Run Developer Menu B KB Explorer 🚻 Preferences Ln 9 Col 37 Ch 25 1/0/0/1 1/1 INS Models\GX17StableForu9\Hospital

Or, if we want to do it in a simpler way, we try the Update and if it doesn't work, we try the Insert...

Let's do so.

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MEDICAL SPECIALTY NAME		Visit Date	Physician Id	Physician Name	Shift Name	Medical Specialt	Office Id	Last Number	
OFFICE VISIT DATE		10/10/22	1	Doctor 1	Shift morning	Family Medicine	2	0 UPDATE	DELETE
SHIFT NAME		10/10/22	1	Doctor 1	Shift intermediate	Family Medicine	2	0 UPDATE	DELETE
		10/11/22	1	Doctor 1	Shift evening	Family Medicine	2	0 UPDATE	DELETE
		10/13/22	1	Doctor 1	Shift morning	Family Medicine	2	0 UPDATE	DELETE
		10/12/22	2	Doctor 2	Shift morning	Family Medicine	1	0 UPDATE	DELETE

Here we have the initial data...

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		linfo			10/10/22		
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SuccessfullyOpdated		vvarning			Data has been successfully updated.		
		Info			10/12/22 Shift morning		
		Error			Office Visit Date, Shift Id, Office Id already exists		
		Info			10/14/22 Shift morning		
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		Info			10/13/22 Shift intermediate		
SuccessfullyAdded		Warning			Data has been successfully added.		
		Info			10/11/22		

And now let's try to launch the schedule in batch mode, for the following week, doctor 1, shift 1.

Let's compare the messages generated with what we expected...

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Id			Туре			Description	
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SuccessfullyUpdated	Monady	rucoudy	Treancoady	maroady	- Thirdy	Data has been successfully updated.	
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	Physician: 1 Office: 1		Physician: 1	Office: 2	Office: 1	Office Visit Date, Shift Id, Office Id already e	xists
	''		·			10/14/22 Shift morning	
SuccessfullyAdded	Physician: 1	Physician: 1		Physician: 1		Data has been successfully added.	
	Office. Z			Office: 1		10/11/22 Shift intermediate	Ş
SuccessfullyAdded		Physician: 1				Data has been successfully added.	
		Office: 2-> 1		Physician: 1		10/13/22 Shift intermediate	
SuccessfullyAdded		Physician: 1 Office: 1				Data has been successfully added.	
	10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022	10/11/22	
SuccessfullyUpdated			Warning			Data has been successfully updated.	
			Info			10/13/22 Shift evening	
PhysicianNotAvailable			Error			Physician 1 already has 2 shifts assigned f	or the date: 10/13/22

The first one was updated successfully, fine.

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Most Frecuent Shift Id	1						
Usual Office Id	1						
Id			Туре			Description	
	Monday	Tuesday	Wednesday	Thursday	Friday	10/10/22	
SuccessfullyUpdated	monady	rucoddy	Teaneodaly	maroady	Thady	Data has been successfully updated.	
Ph Of	Physician: 1 Office: 2-→ 1		Physician: 2 Office: 1	Physician: 1	Physician: 1	10/12/22 Shift morning	
	Physician: 1 Office: 1		Physician: 1 () Office:	Office: 2		Office Visit Date, Shift Id, Office Id already exists	
	''					10/14/22 Shift morning	
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		······································				10/11/22 Shift intermediate	
SuccessfullyAdded		Physician: 1				Data has been successfully added.	
		Office: 2-> 1		Physician: 1		10/13/22 Shift intermediate	
SuccessfullyAdded		Physician: 1 Office: 1				Data has been successfully added.	
	10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022	10/11/22	
SuccessfullyUpdated			Warning			Data has been successfully updated.	
			Info			10/13/22 Shift evening	
PhysicianNotAvailable			Error			Physician 1 already has 2 shifts assigned for the date	e: 10/13/22

The second one failed due to duplicate candidate key, good.

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Most Frecuent Shift Id	1						
Usual Office Id	1						
ld			Туре			Description	
	Monday	Tuesday	Wednesday	Thursday	Friday	10/10/22	
SuccessfullyUpdated	monady	rucoddy		maroady	Thườy	Data has been successfully updated.	
Ph Of	Physician: 1 Office: 2→1		Physician: 2 Office: 1	Physician: 1	Physician: 1	10/12/22 Shift morning	
	Physician: 1 Office: 1		Physician: 1 Office: 1	Office: 2		Office Visit Date, Shift Id, Office Id already exists	
			·			10/14/22 Shift morning	
SuccessfullyAdded	Physician: 1	Physician: 1		Physician: 1		Data has been successfully added.	
	0.000	··································				10/11/22 Shift intermediate	
SuccessfullyAdded		Physician: 1				Data has been successfully added.	
		Office: 2-> 1		Physician: 1		10/13/22 Shift intermediate	
SuccessfullyAdded		Physician: 1 Office: 1				Data has been successfully added.	
	10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022	10/11/22	
SuccessfullyUpdated			Warning			Data has been successfully updated.	
			Info			10/13/22 Shift evening	
PhysicianNotAvailable			Error			Physician 1 already has 2 shifts assigned for the dat	e: 10/13/22

The third one was successfully inserted, good.

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Physician Id	1			Schedu	ile One		
Most Frecuent Shift Id	1						
Usual Office Id	1						
ld			Туре			Description	
	Monday	Tuesday	Wednesday	Thursday	Friday	10/10/22	
SuccessfullyUpdated	monady	ruooddy	Treancoady		Thaty	Data has been successfully updated.	
Pł	Physician: 1 Office: 2-→ 1		Physician: 2 Office: 1	Physician: 1	Physician: 1	10/12/22 Shift morning	
	Physician: 1 Office: 1		Physician: 1 Office: 1	Office: 2		Office Visit Date, Shift Id, Office Id already exists	
			·			10/14/22 Shift morning	
SuccessfullyAdded	Physician: 1 Office: 2	Physician: 1		Physician: 1		Data has been successfully added.	
	Onice. z					10/11/22 Shift intermediate	
SuccessfullyAdded		Physician 1	1			Data has been successfully added.	
		Office: 2-> 1		Physician: 1		10/13/22 Shift intermediate	
SuccessfullyAdded		Physician: 1 Office: 1				Data has been successfully added.	
	10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022	10/11/22	
SuccessfullyUpdated			Warning			Data has been successfully updated.	
			Info			10/13/22 Shift evening	
PhysicianNotAvailable			Error			Physician 1 already has 2 shifts assigned for the date	3: 10/13/22

The fourth one was successfully inserted, good.

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	Monday	Tuesday	Wednesday	Thursday	Friday	10/10/22		
SuccessfullyUpdated Phy Offi	monady	rucoddy	- Treancoad y	maroday	Thady	Data has been successfully updated.		
	Physician: 1 Office: 2->1		Physician: 2 Office: 1	Physician: 1	Physician: 1	10/12/22 Shift morning		
	Physician: 1 Office: 1		Physician: 1 Office: 1	Office: 2	Office: 1	Office Visit Date, Shift Id, Office Id already exists		
			Physicia Office:			10/14/22 Shift morning		
SuccessfullyAdded	Physician: 1 Office: 2	Physician: 1		Physician: 1		Data has been successfully added.		
		·				10/11/22 Shift intermediate		
SuccessfullyAdded		Physician 1	L			Data has been successfully added.		
		Office: 2-> 1		Physician: 1		10/13/22 Shift intermediate		
SuccessfullyAdded		Physician: 1 Office: 1				Data has been successfully added.		
	10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022	10/11/22		
SuccessfullyUpdated			Warning			Data has been successfully updated.		
			Info			10/13/22 Shift evening		
PhysicianNotAvailable			Error			Physician 1 already has 2 shifts assigned for the date:	10/13/22	

The fifth one was also successfully inserted, OK.

S GeneXus Developer Menu	× S Office Visits	×	Office Visits Schedule	× +			~ - O ×
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Physician Id	1			Schedu	le One		
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Usual Office Id	1						
Id			Туре			Description	
	Monday	Tuesday	Wednesday	Thursday	Friday	10/10/22	
SuccessfullyUpdated	monady	rucoddy		maroday	Thaty	Data has been successfully updated.	
Pt	Physician: 1 Office: 2-→ 1		Physician: 2 Office: 1	Physician: 1	Physician: 1	10/12/22 Shift morning	
	Physician: 1 Office: 1		Physician: 1 Office: 1	Office: 2		Office Visit Date, Shift Id, Office Id already exists	
	''					10/14/22 Shift morning	
SuccessfullyAdded	Physician: 1 Office: 2	Physician: 1		Physician: 1		Data has been successfully added.	
		······································				10/11/22 Shift intermediate	
SuccessfullyAdded		Physician: 1				Data has been successfully added.	
		Office: 2-> 1		Physician: 1		10/13/22 Shift intermediate	
SuccessfullyAdded		Physician: 1 Office: 1				Data has been successfully added.	
	10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022	10/11/22	
SuccessfullyUpdated			Warning			Data has been successfully updated.	
			Info			10/13/22 Shift evening	
PhysicianNotAvailable			Error			Physician 1 already has 2 shifts assigned for the dat	e: 10/13/22

The sixth one was successfully updated, OK.

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Most Frecuent Shift Id	1								
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	Physician: 1 Office: 2→1		Physician: 2 Office: 1	Physician: 1	Physician: 1	10/12/22 Shift morning			
	Physician: 1 Office: 1		Physician: 1 () Office:	Office: 2		Office Visit Date, Shift Id, Office Id already exists			
	''		·Qi			10/14/22 Shift morning			
SuccessfullyAdded	Physician: 1 Office: 2	Physician: 1		Physician: 1		Data has been successfully added.			
	omos. 2	······································				10/11/22 Shift intermediate			
SuccessfullyAdded		Physician: 1				Data has been successfully added.			
		Office: 2-> 1		Physician: 1		10/13/22 Shift intermediate			
SuccessfullyAdded		Physician: 1 Office: 1				Data has been successfully added.			
	10-10-2022	10-11-2022	10-12-2022	10-13-2022	10-14-2022	10/11/22			
SuccessfullyUpdated			Warning			Data has been successfully updated.			
			Info			10/13/22 Shift evening			
PhysicianNotAvailable			Error			Physician 1 already has 2 shifts assigned for the date: 1	0/13/22		

And the last one failed because the doctor already had 2 office visits for that day, OK.

Let's see that the office of this visit has indeed changed... OK. And this one... fine too.



So far, we have worked with two-level BCs, but their second level was empty. What we are studying here in relation to the Insert or Update will have no difference with the case in which there is a patient collection that is not empty.

Next, after addressing the differences between business component methods, we will show how to perform the Insert or Update operations with a two-level BC where we will work with the lines, but we will do it at the highest level, using a Data Provider.



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