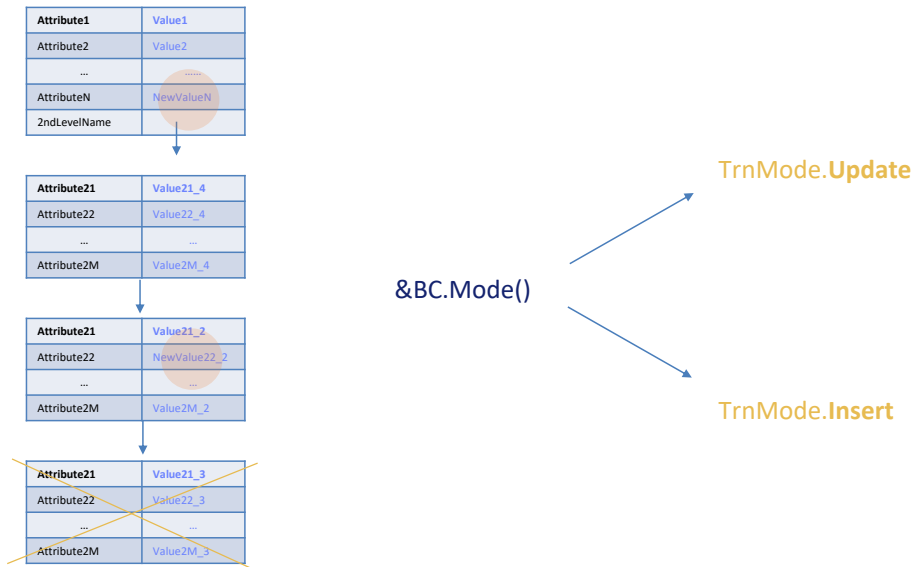


Database update

Update with Business Component. Examples

GeneXus™

In the previous video...

&BC**&BC.Update()**

...we analyzed at a theoretical level two cases that required a different approach when executing the Update method on a business component variable: in one case the variable was in Update mode and in the other the variable was in Insert mode.

We will see examples of each.

The screenshot displays the GeneXus IDE interface for a transaction named 'OfficeVisit'. The left pane shows the 'Structure' view, which is a tree of fields and their types. The right pane shows the 'Rules' view, containing a set of business rules in a code editor.

Name	Type
OfficeVisit	OfficeVisit
OfficeVisitDate	Date
PhysicianId	Id
PhysicianName	Name
ShiftId	Id
ShiftName	Name
MedicalSpecialtyId	Id
MedicalSpecialtyName	Name
OfficeId	Id
OfficeVisitLastNumber	Number
Patient	Patient
PatientId	Id
PatientName	Name
OfficeVisitPatientNumber	Number
OfficeVisitPatientByVideo	Boolean

```

8 PhysicianId = &PhysicianId if not &PhysicianId.IsEmpty();
9 noaccept(PhysicianId) if not &PhysicianId.IsEmpty();
10 ShiftId = &ShiftId if not &ShiftId.IsEmpty();
11 noaccept(ShiftId) if not &ShiftId.IsEmpty();
12
13 OfficeId = &Insert_OfficeId if &Mode = TrnMode.Insert and not &Insert_OfficeId.IsEmpty
14 noaccept(OfficeId) if &Mode = TrnMode.Insert and not &Insert_OfficeId.IsEmpty();}
15 /* Generated by Work With Pattern [End] - Do not change */
16
17 [WEB]{
18     Serial(OfficeVisitPatientNumber, OfficeVisitLastNumber, 1);
19
20     noaccept(OfficeVisitPatientNumber);
21 }
22
23 &shifts = PhysicianShifts(OfficeVisitDate, PhysicianId)
24     If Insert;
25 error("Physician " + PhysicianId.ToString() + " already has 2 shifts assigned for the d
26     + OfficeVisitDate.ToString(), PhysicianNotAvailable) if &shifts >= 2 and Insert;
27
28 &IsOk = isPatientOk(PatientId, MedicalSpecialtyId)
29     if Insert;
30 //checks there is no other office visit pending for the patient for the same specialty
31
32 error("There is a pending office visit scheduled for this patient for the same special
33     PatientAlreadyScheduledForMedicalSpecialty)
34     if not &IsOk and Insert
35     Level PatientId;
36
37 Default( OfficeVisitPatientByVideo, False);

```

Here is a two-level transaction of office visits, with a key composed of the date of the visit, the physician, and the shift; and as secondary data the office, in addition to the last visit number given to a patient of the second level. Here is a representation, then, of the patients who will be seen in that visit. In addition to their identifier, as a secondary attribute we will have a number indicating the order in which the patient will be seen by the doctor, and whether the visit will be made via videoconference or face-to-face.

This transaction has a set of rules declared to govern its behavior and has the Business Component property set.

Office Visit

apps5.genexus.com/ld9df182c70350001219afeaceeb30e8e2/officevisit.aspx?Mode=UPD&OfficeVisitDate=20221021&PhysicianId=1&ShiftId=1

GeneXus DL Portal

Physician Name	Doctor 1
Shift Id	1
Shift Name	Shift morning
Medical Specialty Id	1
Medical Specialty Name	Family Medicine
Office Id	<input type="text" value="1"/> <input type="button" value="↑"/> <input type="button" value="↓"/>
Last Number	6

Patient

	Patient Id	Patient Name	Patient Number	By Video
×	1	↑ Patient1	1	<input checked="" type="checkbox"/>
×	3	↑ Patient3	2	<input type="checkbox"/>
×	6	↑ Patient6	6	<input type="checkbox"/>
	<input type="text" value="0"/>	↑	0	<input type="checkbox"/>
	<input type="text" value="0"/>	↑	0	<input type="checkbox"/>

Here, at runtime, there is a single visit, in office 1, with these three patients.

We will want to change the office to 4; add a patient 4; change the visit of patient 3 to "by video;" and set the same value to the new patient, 4; in addition, we will want to delete patient 6.

We will not do anything to patient 1.

PatientsReSchedule X

Web Layout | Rules | Events | Conditions | Variables | Help | Documentation

<No action group selected>

MainTable

Office Visit Date	&OfficeVisitDate	Physician	&PhysicianId	Shift Id	&ShiftId	new Office Id	&newOfficeId
Patient Id	&newPatientId			Re schedule	BC Mode = TrnMode.UPDATE		
Patient Id	&updPatientId	is By Video	<input type="checkbox"/>				
Patient Id	&dltPatientId						

GRID

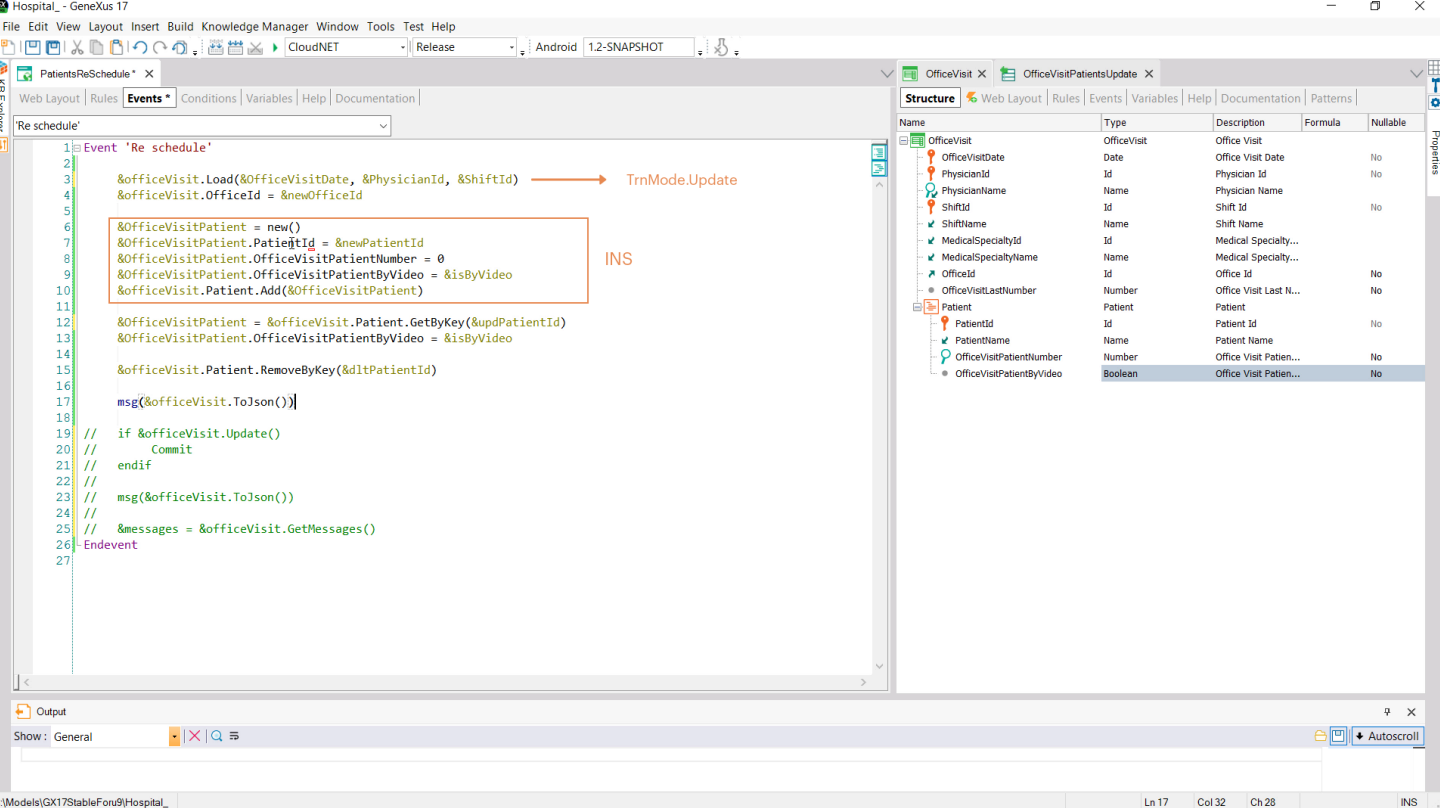
Id	Type	Description
&messages.item(0).Id	&messages.item(0).Type	&messages.item(0).Description

Here is a Web Panel where we ask the user for the identifier of the office visit, and here is the new office, and then:

- In this variable, the patient to be added;
- Here the one to be modified;
- Here the new value for “by video” for that patient, which will be the same as for the new one;
- Finally, here will be the patient to be deleted.

Below we will see the collection of messages obtained when trying to update via the BC.

Let's implement a way to achieve this, the first one we analyzed in the previous video.



&officeVisit is a BC variable of OfficeVisit, precisely. We want to load it from the database, with the values of the primary key, to then:

- Update this property/attribute of the header.
- Insert a new line (through a BC variable of the BC data type of the lines. And we add it to the patient collection).
- Then we want to update another line, so we access it via GetByKey method and there we update the property/attribute we are interested in.
- We also want to delete a line, for which we use the RemoveByKey method of the collection, knowing that this deletion will be logical, and will only leave the item marked for deletion.

Therefore, if at this moment we ask to see the internal content of the &officeVisit variable in this way... (and now we will try it), the JSON should list this:

- This line marked with INS,
- This one with UPD, and
- This last one with DLT.
- What about the others contained in the BC? They might not be marked at all but, as we said, they will be in Update mode by default.

Let's try this for our example...

Hospital Backoffice

by GeneXus

Recents Patients Re Schedule

```
{
  "OfficeVisitDate": "2022-10-21",
  "PhysicianId": 1,
  "PhysicianName": "Doctor 1",
  "ShiftId": 1,
  "ShiftName": "Shift morning",
  "MedicalSpecialtyId": 1,
  "MedicalSpecialtyName": "Family Medicine",
  "Officeld": 4,
  "OfficeVisitLastNumber": 6,
  "Patient": {
    "PatientId": 1,
    "PatientName": "Patient1",
    "OfficeVisitPatientNumber": 1,
    "OfficeVisitPatientByVideo": true,
    "Mode": "UPD",
    "Modified": 0,
    "Initialized": 0,
    "PatientId_Z": 1,
    "PatientName_Z": "Patient1",
    "OfficeVisitPatientNumber_Z": 1,
    "OfficeVisitPatientByVideo_Z": true,
    "Mode_Z": "UPD",
    "Modified_Z": 0,
    "Initialized_Z": 0,
    "PatientId_Z_1": 1,
    "PatientName_Z_1": "Patient1",
    "OfficeVisitPatientNumber_Z_1": 1,
    "OfficeVisitPatientByVideo_Z_1": true,
    "Mode_Z_1": "UPD",
    "Modified_Z_1": 0,
    "Initialized_Z_1": 0,
    "PatientId_Z_2": 3,
    "PatientName_Z_2": "Patient3",
    "OfficeVisitPatientNumber_Z_2": 2,
    "OfficeVisitPatientByVideo_Z_2": true,
    "Mode_Z_2": "UPD",
    "Modified_Z_2": 0,
    "Initialized_Z_2": 0,
    "PatientId_Z_3": 6,
    "PatientName_Z_3": "Patient6",
    "OfficeVisitPatientNumber_Z_3": 6,
    "OfficeVisitPatientByVideo_Z_3": false,
    "Mode_Z_3": "DLT",
    "Modified_Z_3": 0,
    "Initialized_Z_3": 0,
    "PatientId_Z_4": 4,
    "PatientName_Z_4": "",
    "OfficeVisitPatientNumber_Z_4": 0,
    "OfficeVisitPatientByVideo_Z_4": true,
    "Mode_Z_4": "INS",
    "Modified_Z_4": 1,
    "Initialized_Z_4": 0,
    "PatientId_Z_5": 0,
    "PatientName_Z_5": "",
    "OfficeVisitPatientNumber_Z_5": 0,
    "OfficeVisitPatientByVideo_Z_5": false,
    "Mode_Z_5": "INS",
    "Modified_Z_5": 1,
    "Initialized_Z_5": 0,
    "PatientId_Z_6": 0,
    "PatientName_Z_6": ""
  }
}
```

Office Visit Date	10/21/22	Physician	Doctor 1	Shift Id	Shift morning	new Office Id	4
Patient Id	4	Re schedule					
Patient Id	3	is By Video	<input checked="" type="checkbox"/>				
Patient Id	6						
Table Header							
Id	Type	Description					

For this visit, we want to change the office to 4, add patient 4, modify “by video” of patient 3, and delete patient 6. Patient 1 should remain as it is.

So, here we enter the values of the primary key; the new office: 4; the new patient: 4; also, we want to change “by video” of patient 3 and delete patient 6. Ok.

Here we are looking at the JSON. Let's copy it to an editor to view its structure better.

```
File Edit Selection View Go Run Terminal Help
Untitled-2 - Visual Studio Code
redAtt (Untitled-1) Untitled-2
1 {
2   "OfficeVisitDate": "2022-10-21",
3   "PhysicianId": 1,
4   "PhysicianName": "Doctor 1",
5   "ShiftId": 1,
6   "ShiftName": "Shift morning",
7   "MedicalSpecialtyId": 1,
8   "MedicalSpecialtyName": "Family Medicine",
9   "OfficeId": 4,
10  "OfficeVisitLastNumber": 6,
11  "Patient": [
12    {
13      "PatientId": 1,
14      "PatientName": "Patient1",
15      "OfficeVisitPatientNumber": 1,
16      "OfficeVisitPatientByVideo": true,
17      "Mode": "UPD",
18      "Modified": 0,
19      "Initialized": 0,
20      "PatientId_Z": 1,
21      "PatientName_Z": "Patient1",
22      "OfficeVisitPatientNumber_Z": 1,
23      "OfficeVisitPatientByVideo_Z": true
24    },
25    {
26      "PatientId": 3,
27      "PatientName": "Patient3",
28      "OfficeVisitPatientNumber": 2,
29      "OfficeVisitPatientByVideo": true,
30      "Mode": "UPD",
31      "Modified": 1,
32      "Initialized": 0,
33      "PatientId_Z": 3,
34      "PatientName_Z": "Patient3",
35      "OfficeVisitPatientNumber_Z": 2,
36      "OfficeVisitPatientByVideo_Z": false
37    },
38    {
39      "PatientId": 6,
40      "PatientName": "Patient6",
41      "OfficeVisitPatientNumber": 6,

```

Here we can see the information of the header, and that OfficeId has already been changed to 4.


```
File Edit Selection View Go Run Terminal Help
Untitled-2 - Visual Studio Code
Untitled-1
{} Untitled-2
44     "Modified": 0,
45     "Initialized": 0,
46     "PatientId_Z": 6,
47     "PatientName_Z": "Patient6",
48     "OfficeVisitPatientNumber_Z": 6,
49     "OfficeVisitPatientByVideo_Z": false
50   },
51   {
52     "PatientId": 4,
53     "PatientName": "",
54     "OfficeVisitPatientNumber": 0,
55     "OfficeVisitPatientByVideo": true,
56     "Mode": "INS",
57     "Modified": 1,
58     "Initialized": 0,
59     "PatientId_Z": 0,
60     "PatientName_Z": "",
61     "OfficeVisitPatientNumber_Z": 0,
62     "OfficeVisitPatientByVideo_Z": false
63   }
64 ],
65 "Mode": "UPD",
66 "Initialized": 0,
67 "OfficeVisitDate_Z": "2022-10-21",
68 "PhysicianId_Z": 1,
69 "PhysicianName_Z": "Doctor 1",
70 "ShiftId_Z": 1,
71 "ShiftName_Z": "Shift morning",
72 "MedicalSpecialtyId_Z": 1,
73 "MedicalSpecialtyName_Z": "Family Medicine",
74 "OfficeId_Z": 1,
75 "OfficeVisitLastNumber_Z": 6
76 }
```

And if we look down to see the rest of the header info, we see the Update mode and the inferred attributes, for example. Now let's look at the lines.

```
File Edit Selection View Go Run Terminal Help
Untitled-2 - Visual Studio Code
Untitled-1 • Untitled-2 •
1 {
2   "OfficeVisitDate": "2022-10-21",
3   "PhysicianId": 1,
4   "PhysicianName": "Doctor 1",
5   "ShiftId": 1,
6   "ShiftName": "Shift morning",
7   "MedicalSpecialtyId": 1,
8   "MedicalSpecialtyName": "Family Medicine",
9   "OfficeId": 4,
10  "OfficeVisitLastNumber": 6,
11  "Patient": [
12    {
13      "PatientId": 1,
14      "PatientName": "Patient1",
15      "OfficeVisitPatientNumber": 1,
16      "OfficeVisitPatientByVideo": true,
17      "Mode": "UPD",
18      "Modified": 0,
19      "Initialized": 0,
20      "PatientId_Z": 1,
21      "PatientName_Z": "Patient1",
22      "OfficeVisitPatientNumber_Z": 1,
23      "OfficeVisitPatientByVideo_Z": true
24    },
25    {
26      "PatientId": 3,
27      "PatientName": "Patient3",
28      "OfficeVisitPatientNumber": 2,
29      "OfficeVisitPatientByVideo": true,
30      "Mode": "UPD",
31      "Modified": 1,
32      "Initialized": 0,
33      "PatientId_Z": 3,
34      "PatientName_Z": "Patient3",
35      "OfficeVisitPatientNumber_Z": 2,
36      "OfficeVisitPatientByVideo_Z": false
37    },
38    {
39      "PatientId": 6,
40      "PatientName": "Patient6",
41      "OfficeVisitPatientNumber": 6,
```

The first line is that of patient 1, which was not changed. We see, for example, that “by video” is set to true. Anyway, we see that the mode is set to Update. As we said, it is updated anyway with the same information it already had.

```
File Edit Selection View Go Run Terminal Help
Untitled-2 - Visual Studio Code
Untitled-1 • Untitled-2 •
1 {
2   "OfficeVisitDate": "2022-10-21",
3   "PhysicianId": 1,
4   "PhysicianName": "Doctor 1",
5   "ShiftId": 1,
6   "ShiftName": "Shift morning",
7   "MedicalSpecialtyId": 1,
8   "MedicalSpecialtyName": "Family Medicine",
9   "OfficeId": 4,
10  "OfficeVisitLastNumber": 6,
11  "Patient": [
12    {
13      "PatientId": 1,
14      "PatientName": "Patient1",
15      "OfficeVisitPatientNumber": 1,
16      "OfficeVisitPatientByVideo": true,
17      "Mode": "UPD",
18      "Modified": 0,
19      "Initialized": 0,
20      "PatientId_Z": 1,
21      "PatientName_Z": "Patient1",
22      "OfficeVisitPatientNumber_Z": 1,
23      "OfficeVisitPatientByVideo_Z": true
24    },
25    {
26      "PatientId": 3,
27      "PatientName": "Patient3",
28      "OfficeVisitPatientNumber": 2,
29      "OfficeVisitPatientByVideo": true,
30      "Mode": "UPD",
31      "Modified": 1,
32      "Initialized": 0,
33      "PatientId_Z": 3,
34      "PatientName_Z": "Patient3",
35      "OfficeVisitPatientNumber_Z": 2,
36      "OfficeVisitPatientByVideo_Z": false
37    },
38    {
39      "PatientId": 6,
40      "PatientName": "Patient6",
41      "OfficeVisitPatientNumber": 6,
```

Then we see patient 3, which is the one we wanted to change; it is in Update mode and with the new “ByVideo” value—True. Here we see the one that is now in the database before we actually run the Update.

```
File Edit Selection View Go Run Terminal Help
Untitled-2 - Visual Studio Code
Untitled-1 Untitled-2
31     "Modified": 1,
32     "Initialized": 0,
33     "PatientId_Z": 3,
34     "PatientName_Z": "Patient3",
35     "OfficeVisitPatientNumber_Z": 2,
36     "OfficeVisitPatientByVideo_Z": false
37   },
38   {
39     "PatientId": 6,
40     "PatientName": "Patient6",
41     "OfficeVisitPatientNumber": 6,
42     "OfficeVisitPatientByVideo": false,
43     "Mode": "DLT",
44     "Modified": 0,
45     "Initialized": 0,
46     "PatientId_Z": 6,
47     "PatientName_Z": "Patient6",
48     "OfficeVisitPatientNumber_Z": 6,
49     "OfficeVisitPatientByVideo_Z": false
50   },
51   {
52     "PatientId": 4,
53     "PatientName": "",
54     "OfficeVisitPatientNumber": 0,
55     "OfficeVisitPatientByVideo": true,
56     "Mode": "INS",
57     "Modified": 1,
58     "Initialized": 0,
59     "PatientId_Z": 0,
60     "PatientName_Z": "",
61     "OfficeVisitPatientNumber_Z": 0,
62     "OfficeVisitPatientByVideo_Z": false
63   }
64 ],
65 "Mode": "UPD",
66 "Initialized": 0,
67 "OfficeVisitDate_Z": "2022-10-21",
68 "PhysicianId_Z": 1,
69 "PhysicianName_Z": "Doctor 1",
70 "ShiftId_Z": 1,
71 "ShiftName_Z": "Shift_morning".
```

Then we see patient 6, which is marked for deletion.

Finally, number 4, which is marked as new. It has the “by video” property set to True, as we indicated. This false value is due to a Default rule in the transaction, to enter all new patients with this value.

This BC is like this in memory; we still haven't given the order to reflect these operations on the database.

Hospital_ - GeneXus 17

File Edit View Layout Insert Build Knowledge Manager Window Tools Test Help

CloudNET Release Android 1.2-SNAPSHOT

PatientsReSchedule x Navigation View x

Web Layout Rules Events Conditions Variables Help Documentation

'Re schedule'

```

1 Event 'Re schedule'
2
3   &officeVisit.Load(&OfficeVisitDate, &PhysicianId, &ShiftId)
4   &officeVisit.OfficeId = &newOfficeId
5
6   &OfficeVisitPatient = new()
7   &OfficeVisitPatient.PatientId = &newPatientId
8   &OfficeVisitPatient.OfficeVisitPatientNumber = 0
9   &OfficeVisitPatient.OfficeVisitPatientByVideo = &isByVideo
10  &OfficeVisit.Patient.Add(&OfficeVisitPatient)
11
12  &OfficeVisitPatient = &officeVisit.Patient.GetByKey(&updPatientId)
13  &OfficeVisitPatient.OfficeVisitPatientByVideo = &isByVideo
14
15  &OfficeVisit.Patient.RemoveByKey(&oldPatientId)
16
17  msg(&officeVisit.ToJson())
18
19  if &officeVisit.Update()
20    Commit
21  endif
22
23  msg(&officeVisit.ToJson())
24
25  &messages = &officeVisit.GetMessages()
26 EndEvent
27

```

Structure

Name	Type	Description	Formula	Nullable
OfficeVisit	Office Visit	Office Visit		
OfficeVisitDate	Date	Office Visit Date		No
PhysicianId	Id	Physician Id		No
PhysicianName	Name	Physician Name		
ShiftId	Id	Shift Id		No
ShiftName	Name	Shift Name		
MedicalSpecialtyId	Id	Medical Specialty...		
MedicalSpecialtyName	Name	Medical Specialty...		
OfficeId	Id	Office Id		No
OfficeVisitLastNumber	Number	Office Visit Last N...		No
Patient	Patient	Patient		
PatientId	Id	Patient Id		No
PatientName	Name	Patient Name		
OfficeVisitPatientNumber	Number	Office Visit Patien...		No
OfficeVisitPatientByVideo	Boolean	Office Visit Patien...		No

Output

Show: Build

```

----- Execution started -----
Success: Execution
Success: Run Developer Menu

```

Models\GX17StableFon9\Hospital_ Ln 21 Col 11 Ch 7 1/0/0/1 1/1 INS

To do so, we run the Update and if it is successful we commit. Then we ask again to see how the BC variable is now loaded, and also ask to display the messages in the message collection.

Hospital Backoffice



Recents Patients Re Schedule

```
{
  "OfficeVisitDate": "2022-10-21",
  "PhysicianId": 1,
  "PhysicianName": "Doctor 1",
  "ShiftId": 1,
  "ShiftName": "Shift morning",
  "MedicalSpecialtyId": 1,
  "MedicalSpecialtyName": "Family Medicine",
  "OfficeId": 4,
  "OfficeVisitLastNumber": 6,
  "Patient": [
    {
      "PatientId": 1,
      "PatientName": "Patient1",
      "OfficeVisitPatientNumber": 1,
      "OfficeVisitPatientByVideo": true,
      "Mode": "UPD",
      "Modified": 0,
      "Initialized": 0,
      "PatientId_Z": 1,
      "PatientName_Z": "Patient1",
      "OfficeVisitPatientNumber_Z": 1,
      "OfficeVisitPatientByVideo_Z": true,
      "Mode_Z": "UPD",
      "Modified_Z": 0,
      "Initialized_Z": 0,
      "PatientId_Z_2": 1,
      "PatientName_Z_2": "Patient1",
      "OfficeVisitPatientNumber_Z_2": 1,
      "OfficeVisitPatientByVideo_Z_2": true,
      "Mode_Z_2": "UPD",
      "Modified_Z_2": 0,
      "Initialized_Z_2": 0,
      "PatientId_Z_3": 3,
      "PatientName_Z_3": "Patient3",
      "OfficeVisitPatientNumber_Z_3": 2,
      "OfficeVisitPatientByVideo_Z_3": true,
      "Mode_Z_3": "UPD",
      "Modified_Z_3": 1,
      "Initialized_Z_3": 0,
      "PatientId_Z_4": 6,
      "PatientName_Z_4": "Patient6",
      "OfficeVisitPatientNumber_Z_4": 6,
      "OfficeVisitPatientByVideo_Z_4": true,
      "Mode_Z_4": "DLT",
      "Modified_Z_4": 0,
      "Initialized_Z_4": 0,
      "PatientId_Z_5": 4,
      "PatientName_Z_5": "Patient4",
      "OfficeVisitPatientNumber_Z_5": 0,
      "OfficeVisitPatientByVideo_Z_5": true,
      "Mode_Z_5": "INS",
      "Modified_Z_5": 1,
      "Initialized_Z_5": 0,
      "PatientId_Z_6": 0,
      "PatientName_Z_6": "",
      "OfficeVisitPatientNumber_Z_6": 0,
      "OfficeVisitPatientByVideo_Z_6": false,
      "Mode_Z_6": "INS",
      "Modified_Z_6": 1,
      "Initialized_Z_6": 0,
      "PatientId_Z_7": 10-21,
      "PhysicianId_Z_7": 1,
      "PhysicianName_Z_7": "Doctor 1",
      "ShiftId_Z_7": 1,
      "ShiftName_Z_7": "Shift morning",
      "MedicalSpecialtyId_Z_7": 1,
      "MedicalSpecialtyName_Z_7": "Family Medicine",
      "OfficeId_Z_7": 1,
      "OfficeVisitLastNumber_Z_7": 6
    }
  ]
}
```

```
{
  "OfficeVisitDate": "2022-10-21",
  "PhysicianId": 1,
  "PhysicianName": "Doctor 1",
  "ShiftId": 1,
  "ShiftName": "Shift morning",
  "MedicalSpecialtyId": 1,
  "MedicalSpecialtyName": "Family Medicine",
  "OfficeId": 4,
  "OfficeVisitLastNumber": 6,
  "Patient": [
    {
      "PatientId": 1,
      "PatientName": "Patient1",
      "OfficeVisitPatientNumber": 1,
      "OfficeVisitPatientByVideo": true,
      "Mode": "UPD",
      "Modified": 1,
      "Initialized": 0,
      "PatientId_Z": 1,
      "PatientName_Z": "Patient1",
      "OfficeVisitPatientNumber_Z": 1,
      "OfficeVisitPatientByVideo_Z": true,
      "Mode_Z": "UPD",
      "Modified_Z": 1,
      "Initialized_Z": 0,
      "PatientId_Z_2": 3,
      "PatientName_Z_2": "Patient3",
      "OfficeVisitPatientNumber_Z_2": 2,
      "OfficeVisitPatientByVideo_Z_2": true,
      "Mode_Z_2": "UPD",
      "Modified_Z_2": 1,
      "Initialized_Z_2": 0,
      "PatientId_Z_3": 6,
      "PatientName_Z_3": "Patient6",
      "OfficeVisitPatientNumber_Z_3": 6,
      "OfficeVisitPatientByVideo_Z_3": true,
      "Mode_Z_3": "DLT",
      "Modified_Z_3": 0,
      "Initialized_Z_3": 0,
      "PatientId_Z_4": 4,
      "PatientName_Z_4": "Patient4",
      "OfficeVisitPatientNumber_Z_4": 0,
      "OfficeVisitPatientByVideo_Z_4": true,
      "Mode_Z_4": "UPD",
      "Modified_Z_4": 1,
      "Initialized_Z_4": 0,
      "PatientId_Z_5": 0,
      "PatientName_Z_5": "Patient4",
      "OfficeVisitPatientNumber_Z_5": 0,
      "OfficeVisitPatientByVideo_Z_5": true,
      "Mode_Z_5": "UPD",
      "Modified_Z_5": 1,
      "Initialized_Z_5": 0,
      "PatientId_Z_6": 10-21,
      "PhysicianId_Z_6": 1,
      "PhysicianName_Z_6": "Doctor 1",
      "ShiftId_Z_6": 1,
      "ShiftName_Z_6": "Shift morning",
      "MedicalSpecialtyId_Z_6": 1,
      "MedicalSpecialtyName_Z_6": "Family Medicine",
      "OfficeId_Z_6": 4,
      "OfficeVisitLastNumber_Z_6": 6
    }
  ]
}
```

Office Visit Date: 10/21/22 29 Physician: Doctor 1 Shift Id: Shift morning new Office Id: 4

Patient Id: 4 Re schedule
Patient Id: 3 is By Video
Patient Id: 6

Id		Type	Description
SuccessfullyUpdated		Warning	Data has been successfully updated. I

We enter the same values... and see that the update was successful; now let's analyze the two JSONs: the ones before and after the Update.

```
File Edit Selection View Go Run Terminal Help
Untitled-2 - Visual Studio Code

redAtt Untitled-1 {} Untitled-2 1
71 "ShiftName_Z": "Shift morning",
72 "MedicalSpecialtyId_Z": 1,
73 "MedicalSpecialtyName_Z": "Family Medicine",
74 "OfficeId_Z": 1,
75 "OfficeVisitLastNumber_Z": 6
76 }
77 }
78 "OfficeVisitDate": "2022-10-21",
79 "PhysicianId": 1,
80 "PhysicianName": "Doctor 1",
81 "ShiftId": 1,
82 "ShiftName": "Shift morning",
83 "MedicalSpecialtyId": 1,
84 "MedicalSpecialtyName": "Family Medicine",
85 "OfficeId": 4,
86 "OfficeVisitLastNumber": 6,
87 "Patient": [
88   {
89     "PatientId": 1,
90     "PatientName": "Patient1",
91     "OfficeVisitPatientNumber": 1,
92     "OfficeVisitPatientByVideo": true,
93     "Mode": "UPD",
94     "Modified": 1,
95     "Initialized": 0,
96     "PatientId_Z": 1,
97     "PatientName_Z": "Patient1",
98     "OfficeVisitPatientNumber_Z": 1,
99     "OfficeVisitPatientByVideo_Z": true
100   },
101   {
102     "PatientId": 3,
103     "PatientName": "Patient3",
104     "OfficeVisitPatientNumber": 2,
105     "OfficeVisitPatientByVideo": true,
106     "Mode": "UPD",
107     "Modified": 1,
108     "Initialized": 0,
109     "PatientId_Z": 3,
110     "PatientName_Z": "Patient3",
111     "OfficeVisitPatientNumber_Z": 2
112   }
113 ],
114 "OfficeVisitPatientNumber": 2
115 }
```

Here is the previous one, which we have already analyzed.

And here is the one after the Update, where the office has effectively been changed.

```
File Edit Selection View Go Run Terminal Help
Untitled-2 - Visual Studio Code
Untitled-1 • Untitled-2
81 "ShiftId": 1,
82 "ShiftName": "Shift morning",
83 "MedicalSpecialtyId": 1,
84 "MedicalSpecialtyName": "Family Medicine",
85 "OfficeId": 4,
86 "OfficeVisitLastNumber": 6,
87 "Patient": [
88   {
89     "PatientId": 1,
90     "PatientName": "Patient1",
91     "OfficeVisitPatientNumber": 1,
92     "OfficeVisitPatientByVideo": true,
93     "Mode": "UPD",
94     "Modified": 1,
95     "Initialized": 0,
96     "PatientId_Z": 1,
97     "PatientName_Z": "Patient1",
98     "OfficeVisitPatientNumber_Z": 1,
99     "OfficeVisitPatientByVideo_Z": true
100   },
101   {
102     "PatientId": 3,
103     "PatientName": "Patient3",
104     "OfficeVisitPatientNumber": 2,
105     "OfficeVisitPatientByVideo": true,
106     "Mode": "UPD",
107     "Modified": 1,
108     "Initialized": 0,
109     "PatientId_Z": 3,
110     "PatientName_Z": "Patient3",
111     "OfficeVisitPatientNumber_Z": 2,
112     "OfficeVisitPatientByVideo_Z": true
113   },
114   {
115     "PatientId": 4,
116     "PatientName": "Patient4",
117     "OfficeVisitPatientNumber": 0,
118     "OfficeVisitPatientByVideo": true,
119     "Mode": "UPD",
120     "Modified": 1,
121     "Initialized": 0
122   }
123 ]
Ln 85, Col 18 Spaces: 4 UTF-8 CRLF ( ) JSON
```

Patient 1 is exactly the same as it was...


```
File Edit Selection View Go Run Terminal Help
Untitled-2 - Visual Studio Code
Untitled-2 1
"MedicalSpecialtyName": "Family Medicine",
"OfficeId": 4,
"OfficeVisitLastNumber": 6,
"Patient": [
  {
    "PatientId": 1,
    "PatientName": "Patient1",
    "OfficeVisitPatientNumber": 1,
    "OfficeVisitPatientByVideo": true,
    "Mode": "UPD",
    "Modified": 1,
    "Initialized": 0,
    "PatientId_Z": 1,
    "PatientName_Z": "Patient1",
    "OfficeVisitPatientNumber_Z": 1,
    "OfficeVisitPatientByVideo_Z": true
  },
  {
    "PatientId": 3,
    "PatientName": "Patient3",
    "OfficeVisitPatientNumber": 2,
    "OfficeVisitPatientByVideo": true
    "Mode": "UPD",
    "Modified": 1,
    "Initialized": 0,
    "PatientId_Z": 3,
    "PatientName_Z": "Patient3",
    "OfficeVisitPatientNumber_Z": 2,
    "OfficeVisitPatientByVideo_Z": true
  },
  {
    "PatientId": 4,
    "PatientName": "Patient4",
    "OfficeVisitPatientNumber": 0,
    "OfficeVisitPatientByVideo": true,
    "Mode": "UPD",
    "Modified": 1,
    "Initialized": 0,
    "PatientId_Z": 4,
    "PatientName_Z": "Patient4",
    "OfficeVisitPatientNumber_Z": 0.
  }
]
Ln 85, Col 18 Spaces: 4 UTF-8 CRLF ( ) JSON
```

Patient 3, which we updated by setting it to true... and now we see that the value in the database of course matches the value in memory.

```
File Edit Selection View Go Run Terminal Help
Untitled-2 - Visual Studio Code
Untitled-1 • Untitled-2 1 •
94     "Modified": 1,
95     "Initialized": 0,
96     "PatientId_Z": 1,
97     "PatientName_Z": "Patient1",
98     "OfficeVisitPatientNumber_Z": 1,
99     "OfficeVisitPatientByVideo_Z": true
100  },
101  {
102     "PatientId": 3,
103     "PatientName": "Patient3",
104     "OfficeVisitPatientNumber": 2,
105     "OfficeVisitPatientByVideo": true,
106     "Mode": "UPD",
107     "Modified": 1,
108     "Initialized": 0,
109     "PatientId_Z": 3,
110     "PatientName_Z": "Patient3",
111     "OfficeVisitPatientNumber_Z": 2,
112     "OfficeVisitPatientByVideo_Z": true
113  },
114  {
115     "PatientId": 4,
116     "PatientName": "Patient4",
117     "OfficeVisitPatientNumber": 0,
118     "OfficeVisitPatientByVideo": true,
119     "Mode": "UPD",
120     "Modified": 1,
121     "Initialized": 0,
122     "PatientId_Z": 4,
123     "PatientName_Z": "Patient4",
124     "OfficeVisitPatientNumber_Z": 0,
125     "OfficeVisitPatientByVideo_Z": true
126  }
127 ],
128 "Mode": "UPD",
129 "Initialized": 0,
130 "OfficeVisitDate_Z": "2022-10-21",
131 "PhysicianId_Z": 1,
132 "PhysicianName_Z": "Doctor 1",
133 "ShiftId_Z": 1,
134 "ShiftName_Z": "Shift_morning".
```

Patient 4, which is new, is no longer labeled as Insert but as Update, which is the default value... also with "by video" set to true.

Patient 6 is no longer in the collection, it has been deleted.

Office Visit Patients Re Schedule

apps5.genexus.com/ld9df182c70350001219afeaceeb30e8e2/officevisit.aspx?Mode=UPD&OfficeVisitDate=20221021&PhysicianId=1&ShiftId=1

Physician Id 1

Physician Name Doctor 1

Shift Id 1

Shift Name Shift morning

Medical Specialty Id 1

Medical Specialty Name Family Medicine

Office Id

Last Number 6

Patient

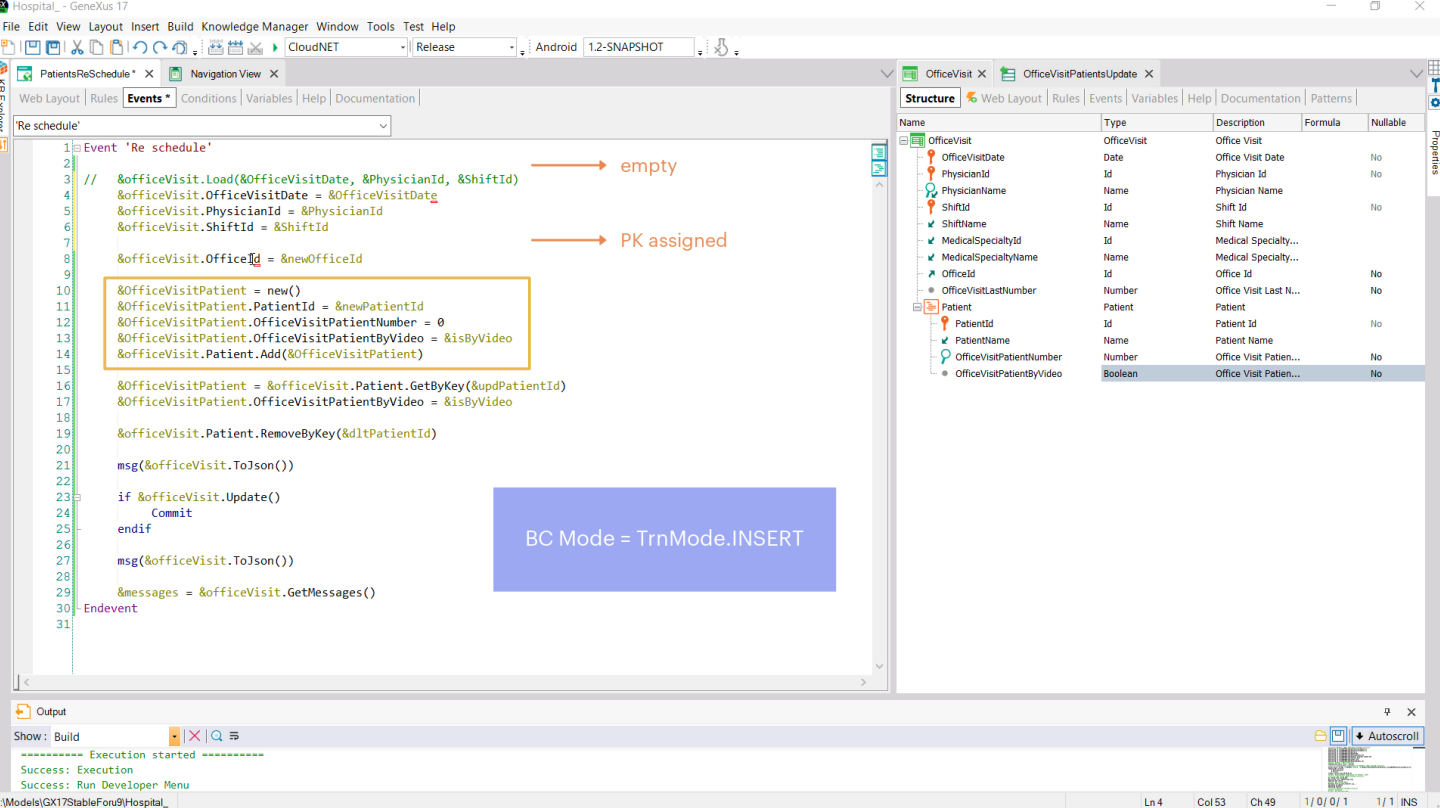
	Patient Id	Patient Name	Patient Number By Video
×	1	↑ Patient1	1 <input checked="" type="checkbox"/>
×	3	↑ Patient3	2 <input checked="" type="checkbox"/>
×	4	↑ Patient4	0 <input checked="" type="checkbox"/>
	<input type="text" value="0"/>	↑	0 <input type="checkbox"/>
	<input type="text" value="0"/>	↑	0 <input type="checkbox"/>

Now if we check this in the transaction: we refresh...

We will have to see a 4 here...

And indeed:

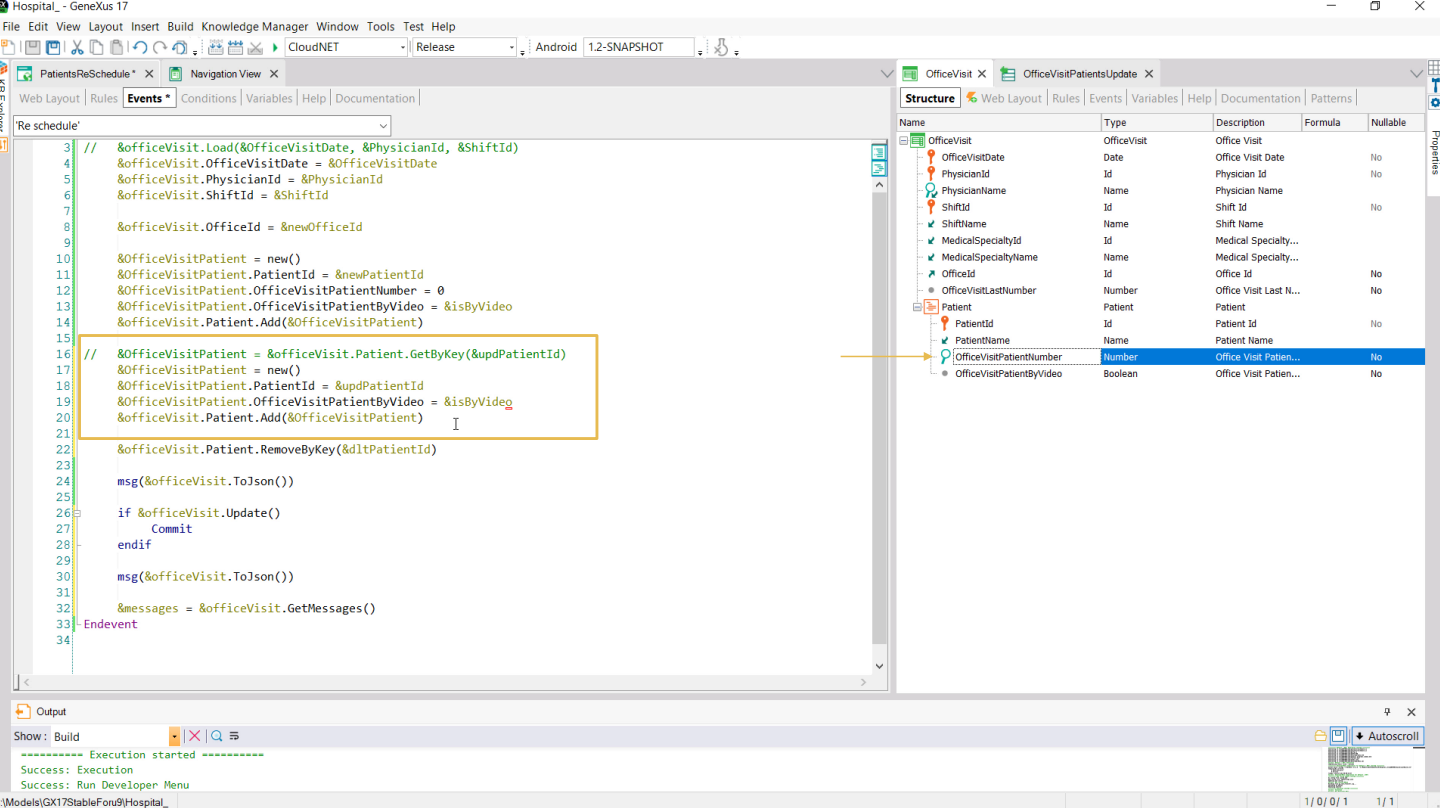
- Patient 1 is as it was,
- 3 is now marked as "by video,"
- 4 has been added with a 0 for the number to be seen by the doctor, and
- 6 has been deleted.



Now, let's try to achieve the same result, but without loading the variable from the database; instead, we want to use the variable in Insert mode.

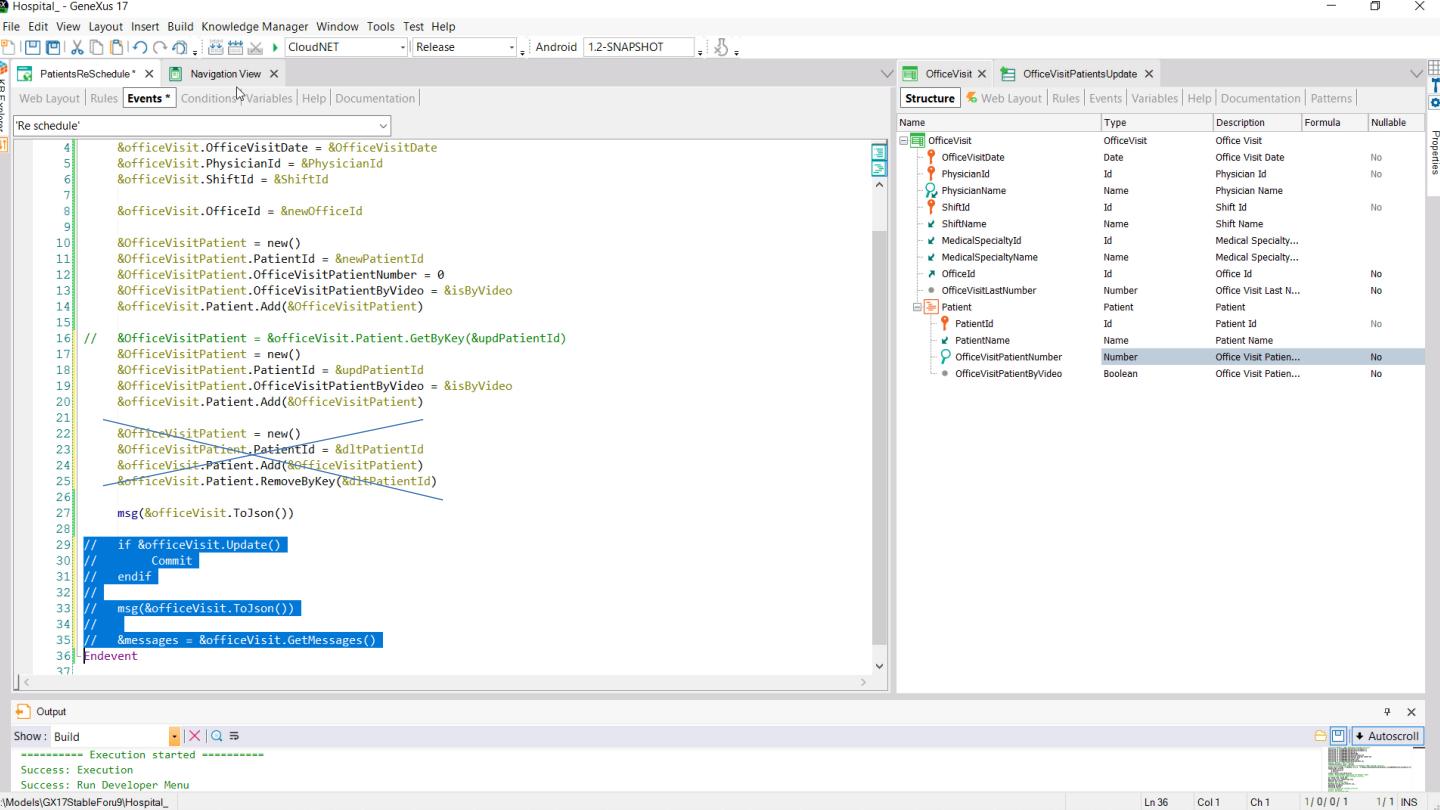
If we then replace the Load by assigning directly to the primary key properties of its value... the `&OfficeVisit` variable will be in Insert mode, and before doing anything, empty. At this point, it will only have a value for the primary key. Here we add a value to this property, and LastNumber will be empty.

Then, we add a line as in the other case, adding the item to the collection.



However, for the line we want to update we should not run any GetByKey because we do not have the &officeVisit variable loaded in the database. Here what we must do is add an item to the collection, but we must be careful to request new memory space, specify for its identifier a value that we know exists, and only assign a value to the property we want to change, which is this one. And then add the item.

Note that we only assign a value to the attribute that we want to change. We don't change the property corresponding to this other one because we want it to keep the value that it has in the database.



Well, what about the line we want to delete? We can't do it with the variable in Insert mode, because even if we insert the item in the collection and indicate that we want to delete it, this deletion will not be logical but physical. Indeed, this RemoveByKey will remove the item as if we had never inserted it.

Let's see it in the JSON. We comment this and execute.

```
File Edit Selection View Go Run Terminal Help
Untitled-3 - Visual Studio Code
Untitled-1 Untitled-2 Untitled-3
17
18     "Modified": 1,
19     "Initialized": 0,
20     "PatientId_Z": 0,
21     "PatientName_Z": "",
22     "OfficeVisitPatientNumber_Z": 0,
23     "OfficeVisitPatientByVideo_Z": false
24   },
25   {
26     "PatientId": 3,
27     "PatientName": "",
28     "OfficeVisitPatientNumber": 0,
29     "OfficeVisitPatientByVideo": true,
30     "Mode": "INS",
31     "Modified": 1,
32     "Initialized": 0,
33     "PatientId_Z": 0,
34     "PatientName_Z": "",
35     "OfficeVisitPatientNumber_Z": 0,
36     "OfficeVisitPatientByVideo_Z": false
37   }
38 ],
39 "Mode": "INS",
40 "Initialized": 0,
41 "OfficeVisitDate_Z": "0000-00-00",
42 "PhysicianId_Z": 0,
43 "PhysicianName_Z": "",
44 "ShiftId_Z": 0,
45 "ShiftName_Z": "",
46 "MedicalSpecialtyId_Z": 0,
47 "MedicalSpecialtyName_Z": "",
48 "OfficeId_Z": 0,
49 "OfficeVisitLastNumber_Z": 0
50 }
```

I left the visit as it was before, with office 1, patient 1 “by video,” patient 3 with false there and patient 6....

Let's run with the same changes as before, and analyze the JSON.

First, we can see that the header is in Insert mode, as we expected...

```
File Edit Selection View Go Run Terminal Help
Untitled-3 - Visual Studio Code
Untitled-3
1 {
2   "OfficeVisitDate": "2022-10-21",
3   "PhysicianId": 1,
4   "PhysicianName": "",
5   "ShiftId": 1,
6   "ShiftName": "",
7   "MedicalSpecialtyId": 0,
8   "MedicalSpecialtyName": "",
9   "OfficeId": 4,
10  "OfficeVisitLastNumber": 0,
11  "Patient": [
12    {
13      "PatientId": 4,
14      "PatientName": "",
15      "OfficeVisitPatientNumber": 0,
16      "OfficeVisitPatientByVideo": true,
17      "Mode": "INS",
18      "Modified": 1,
19      "Initialized": 0,
20      "PatientId Z": 0,
21      "PatientName Z": "",
22      "OfficeVisitPatientNumber Z": 0,
23      "OfficeVisitPatientByVideo Z": false
24    },
25    {
26      "PatientId": 3,
27      "PatientName": "",
28      "OfficeVisitPatientNumber": 0,
29      "OfficeVisitPatientByVideo": true,
30      "Mode": "INS",
31      "Modified": 1,
32      "Initialized": 0,
33      "PatientId Z": 0,
34      "PatientName Z": "",
35      "OfficeVisitPatientNumber Z": 0,
36      "OfficeVisitPatientByVideo Z": false
37    }
38  ],
39  "Mode": "INS",
40  "Initialized": 0,
41  "OfficeVisitDate Z": "0000-00-00",

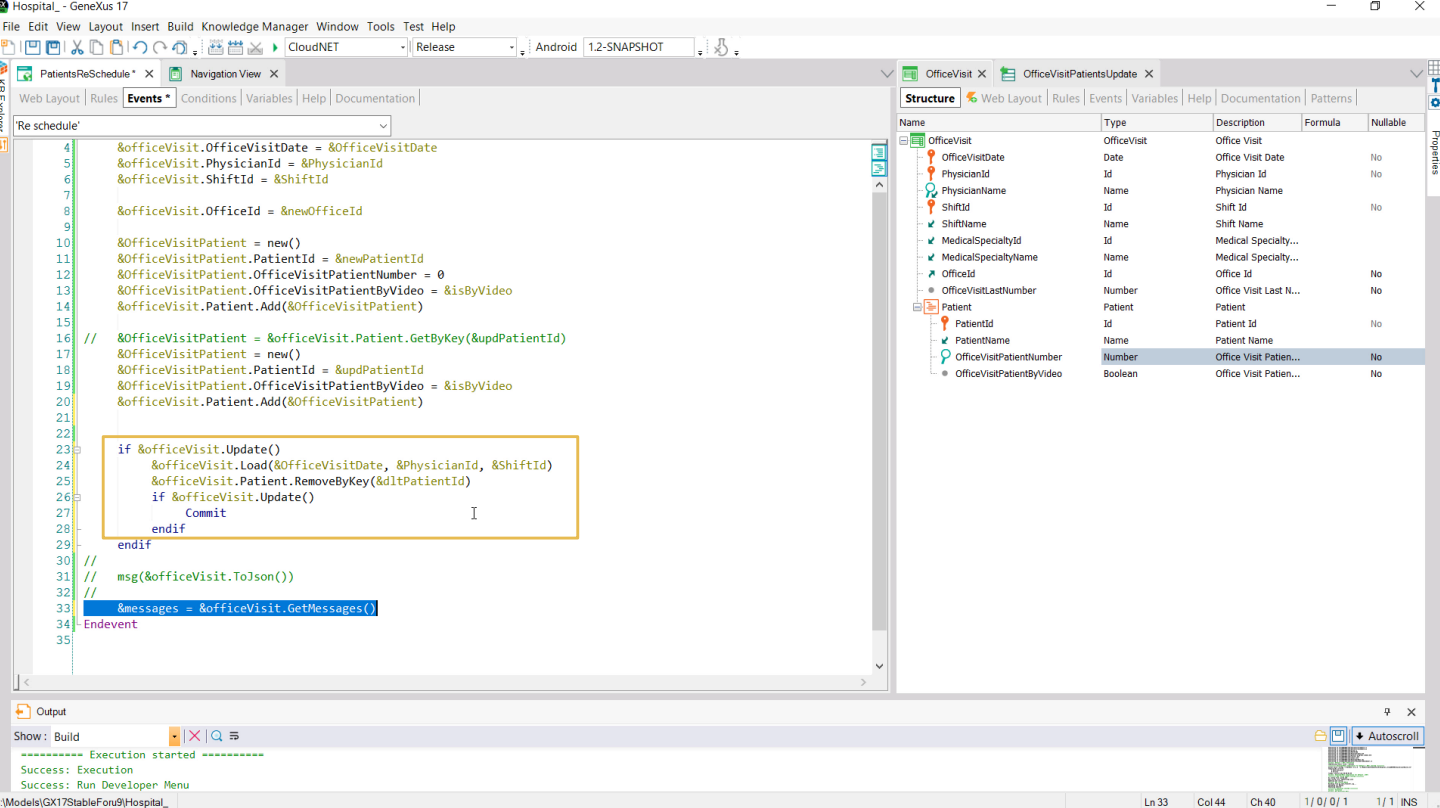
```

...and only the properties corresponding to the primary key and the OfficeId property to which we gave the new value are loaded with non-empty values.

Then we see that only 2 lines are loaded in the business component:

- The one corresponding to the line to be inserted, which is in INS mode, number 4, with its values.
- And the line that we ask to modify, which is 3, is also in INS mode because the header variable in INS mode cannot distinguish modes for the lines. This will be processed later, when the Update method is executed. Only then will all the information from the database be loaded into an auxiliary variable and we will see if there is a record/item for this patient in order not to try to insert but to update. What? Only the properties that have been changed, which in this case will have been only this one.

It is absolutely clear that there is no news about the patient 6 we wanted to delete.



That's because we cannot make the deletion when the variable is in Insert mode; therefore, let's delete all this, and leave this part for later...

Let's delete this message we no longer need.

Now we try to Update, which, if successful, will perform the operations we have seen. In that case, we commit.

Here, before making the commit is when we have to delete the patient that we wanted to delete. This would be fine but, as we warned in the previous video, there is a bug in GeneXus 17. As a result, when this OfficeVisit variable is in Insert mode, after the Update it is not loaded with the values that it should, the current ones in the database. As a workaround, we will make an explicit load.

In short, here we made the update, after which this new line will have been inserted in the database and this one will have been updated, because this patient exists. Then we load from the database the variable with all that done, delete the patient that we wanted, and perform an Update again on the variable so that it executes this deletion in a physical way. If it is successful, we can then commit it.

We are going to remove the comments from this and execute.

Recents Office Visit — Patients Re Schedule

Office Visit Date: 10/21/22 29 Physician: Doctor 1 Shift Id: Shift morning new Office Id: 4

Patient Id: 4 Re schedule

Patient Id: 3 is By Video

Patient Id: 6

Id	Type	Description
SuccessfullyUpdated	Warning	Data has been successfully updated.

Here we have the visit as we had it before, and now we are going to ask for all the updates and see that the visit was updated successfully; if we refresh...

Office Visit Patients Re Schedule

apps5.genexus.com/Id9df182c70350001219afeaceeb30e8e2/officevisit.aspx?Mode=UPD&OfficeVisitDate=20221021&PhysicianId=1&ShiftId=1

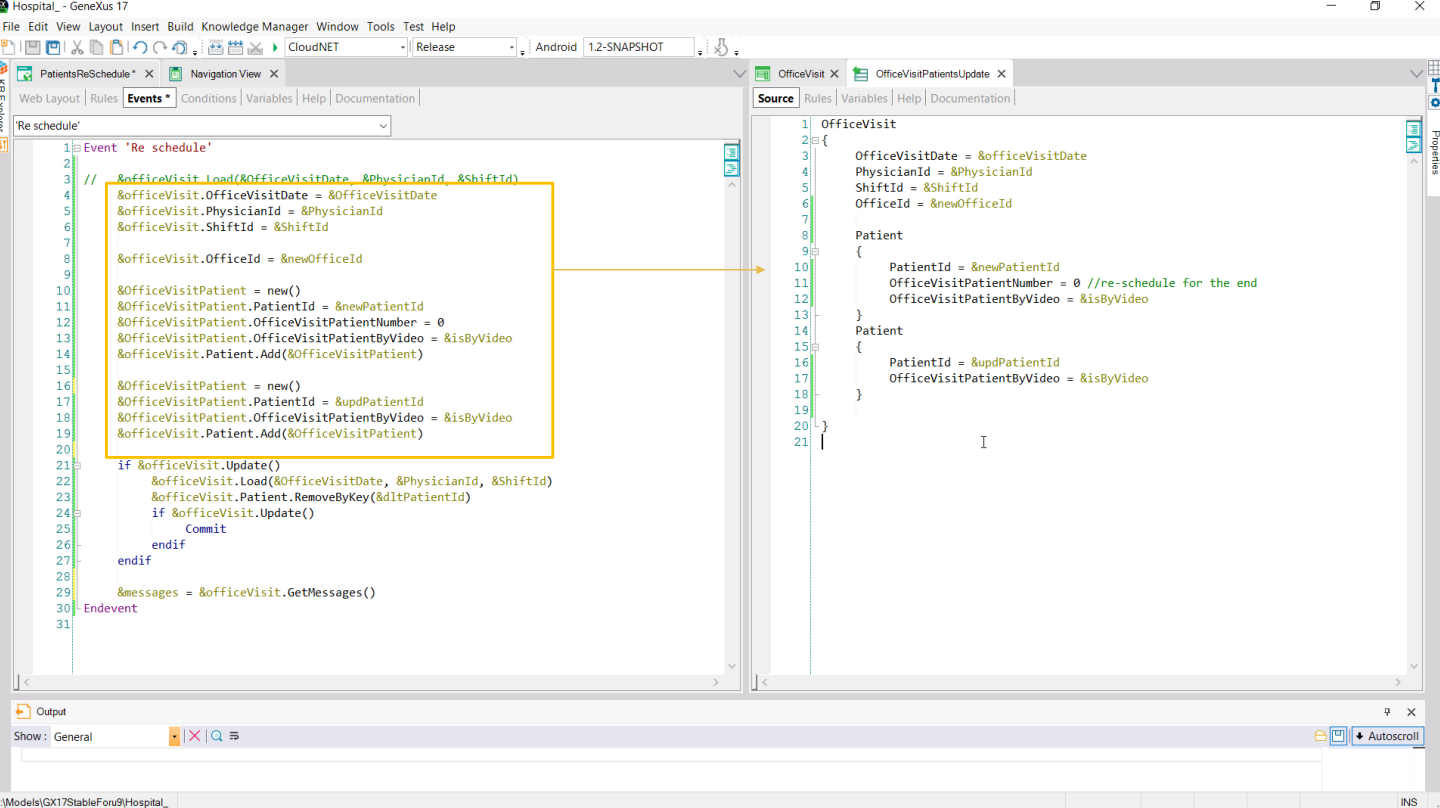
GeneXus DL Portal

Shift Id	1
Shift Name	Shift morning
Medical Specialty Id	1
Medical Specialty Name	Family Medicine
Office Id	<input type="text" value=""/> <input type="button" value="↑"/> <input type="button" value="↓"/>
Last Number	0

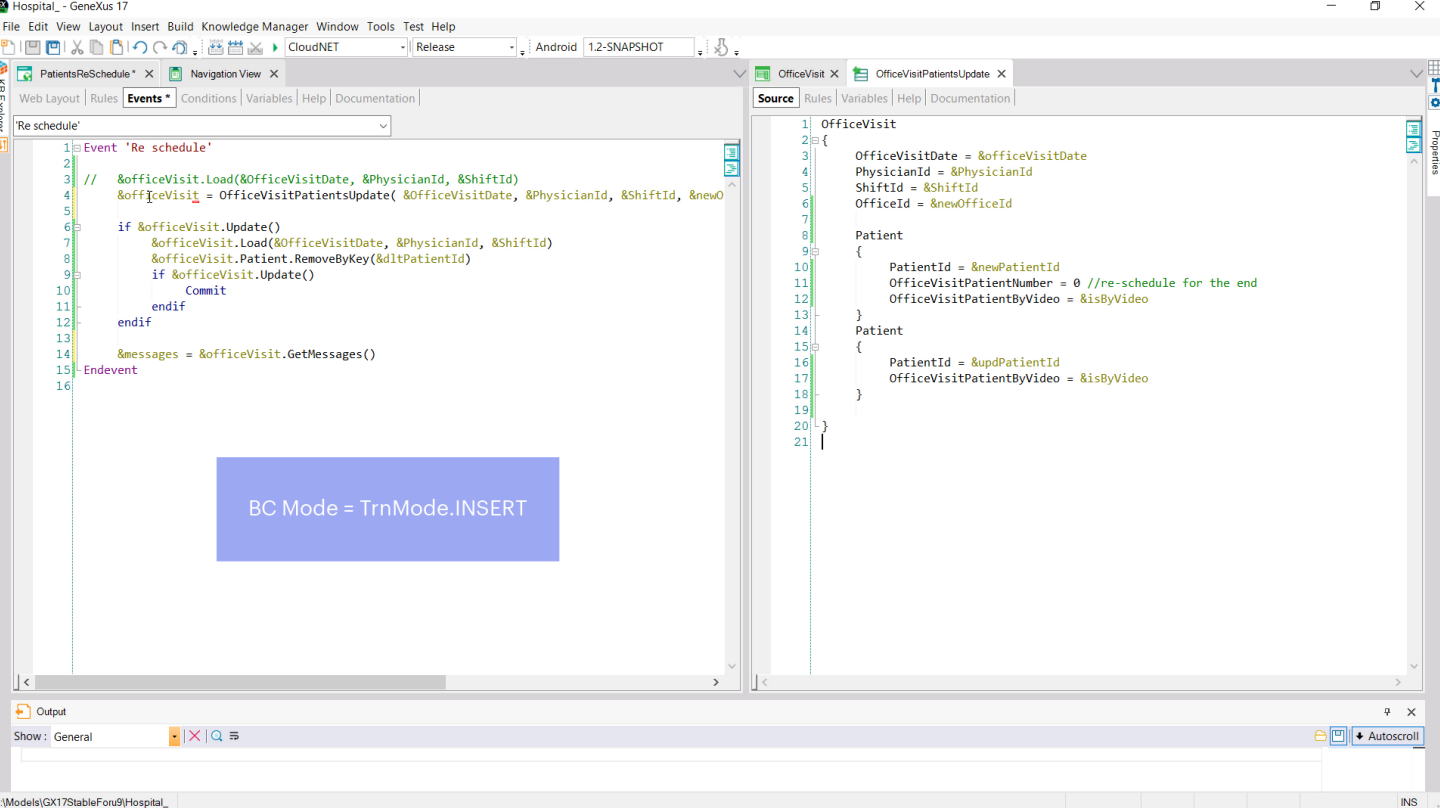
Patient

	Patient Id	Patient Name	Patient Number	By Video
×	1	↑ Patient1	1	<input checked="" type="checkbox"/>
×	3	↑ Patient3	2	<input checked="" type="checkbox"/>
×	4	↑ Patient4	0	<input checked="" type="checkbox"/>
	<input type="text" value="0"/>	↑	0	<input type="checkbox"/>
	<input type="text" value="0"/>	↑	0	<input type="checkbox"/>
	<input type="text" value="0"/>	↑	0	<input type="checkbox"/>
	<input type="text" value="0"/>	↑	0	<input type="checkbox"/>
	<input type="text" value="0"/>	↑	0	<input type="checkbox"/>

...we see that indeed it did what we wanted, including the deletion of the line corresponding to patient 6.



Of course, we could have achieved exactly the same if instead of manually loading the `&officeVisit` variable in this way, we had done it with a Data Provider, which returns an instance of `OfficeVisit`, and loads in a simpler way the part of the header we are interested in and the two lines: the one we want to insert and the one we want to update.



As we said in the previous video, the Data Provider will always return its result in Insert mode. So &officeVisit will be here, inevitably in that mode. Let's test it again to confirm that we get exactly the same result.

Hospital Backoffice



Recents Office Visit — Office Visits — Patients Re Schedule

Office Visit Date: 10/21/22 29 Physician: Doctor 1 Shift Id: Shift morning new Office Id: 4

Patient Id: 4 Re schedule

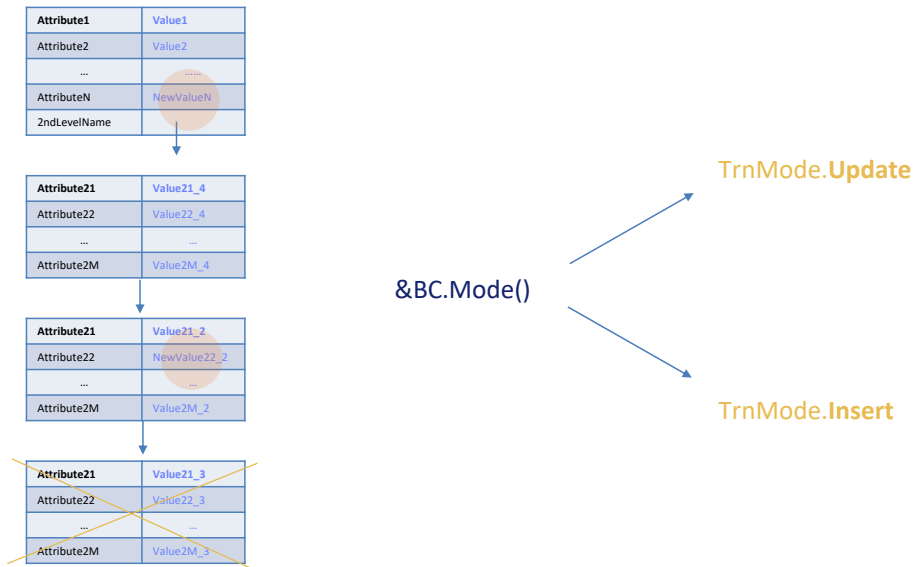
Patient Id: 3 is By Video

Patient Id: 6

Id	Type	Description
SuccessfullyUpdated	Warning	Data has been successfully updated.

Then again we leave the visit as it was before...with office 1 and these lines....

We indicate the updates we want and run again... Success.

&BC**&BC.Update()**

Here we showed examples of everything we saw at a theoretical level in the previous video: how the update works when the variable is in Update mode and how it works when it is in Insert mode.

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