Triggers and Stored Procedures

A database trigger is a procedure that is automatically executed in response to certain events on a database table

Sample Usage - Auditing

As the system runs, you keep modify the data in database…

Triggers and Stored Procedures

Sample Usage - Auditing

Who modified the price of milk to $320?

When did he/she do it?
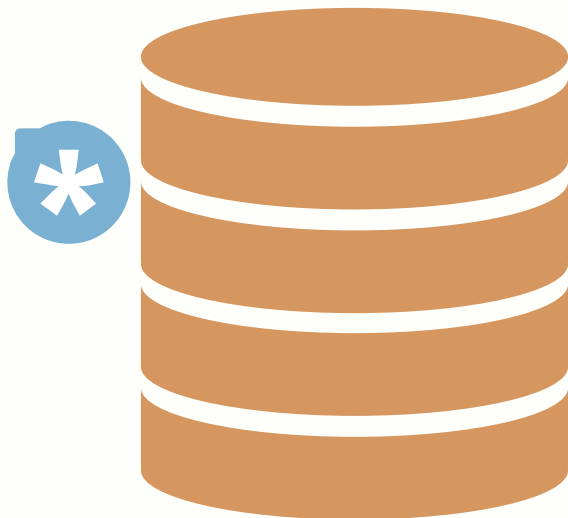
What was the value before the change?

…

Product	Price
Biscuit	10
Bread	8
Milk	320
Sugar	6

For business reasons, you may want to know the answer of these questions.
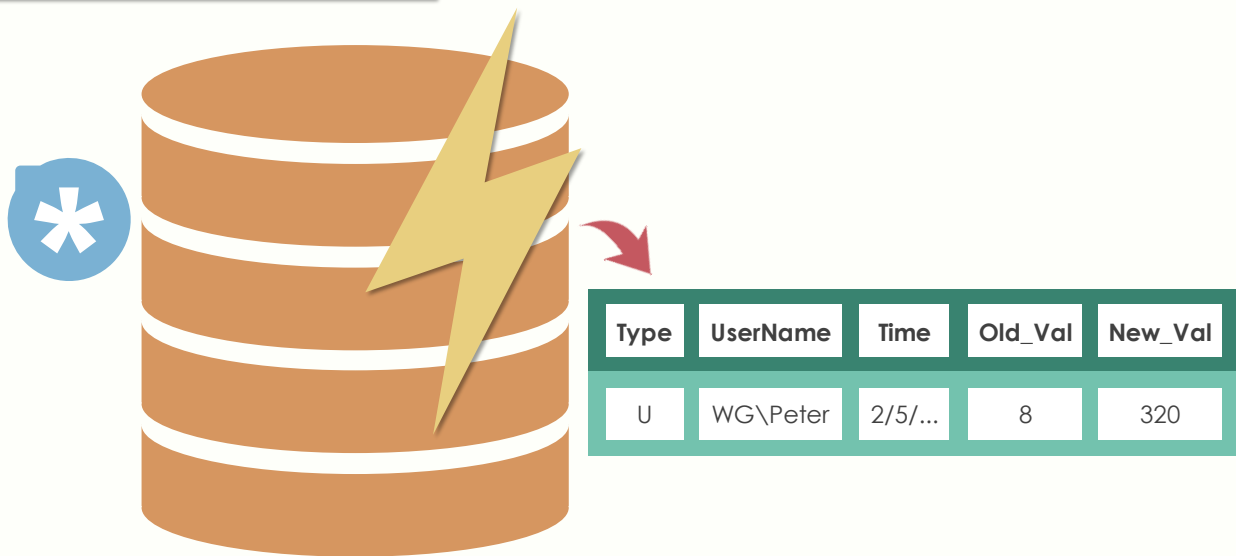
Triggers and Stored Procedures

Sample Usage - Auditing

Trigger can be used to audit your database. Let's say if someone is trying to update a record
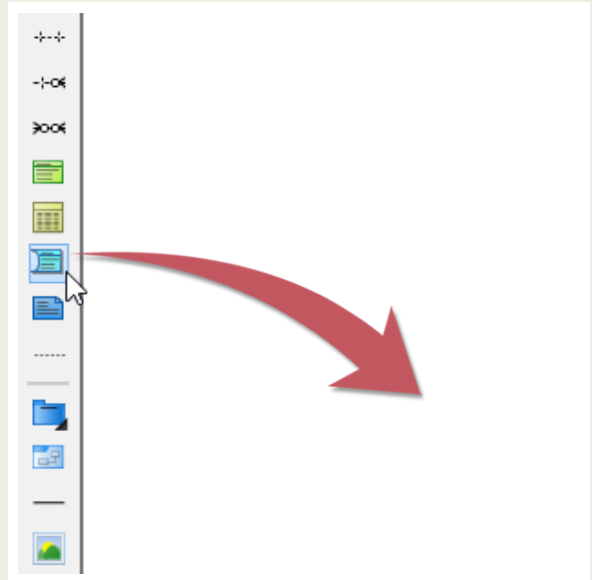
Sample Usage - Auditing

Type	UserName	Time	Old_Val	New_Val
U	WG\Peter	2/5/...	8	320

If you have written a trigger for auditing, it can help you log his action before writing data into DB
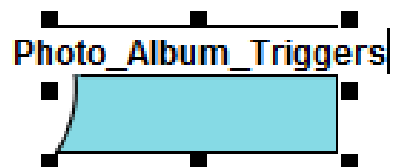
Creating a Trigger

1. Drag **Triggers** from diagram toolbar to diagram.

Creating a Trigger

1. Drag **Triggers** from diagram toolbar to diagram.
2. Name it.

Photo_Album_Triggers

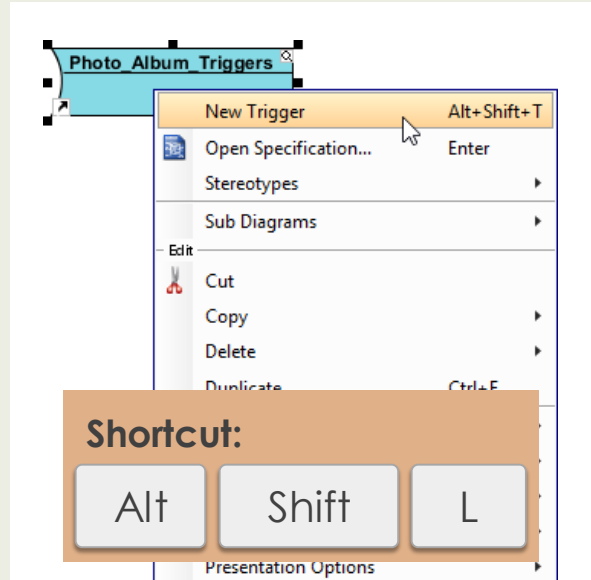Note: This is a **container** of triggers, not the trigger itself

Creating a Trigger

1. Drag **Triggers** from diagram toolbar to diagram.
2. Name it.
3. Right click on the Triggers shape and select **New Trigger** from the popup menu.

Photo_Album_Triggers

	New Trigger	Alt+Shift+T
	Open Specification...	Enter
	Stereotypes	▸
	Sub Diagrams	▸
Edit		
✂	Cut	
	Copy	▸
	Delete	▸
	Duplicate	Ctrl+E

Shortcut:

Alt	Shift	L

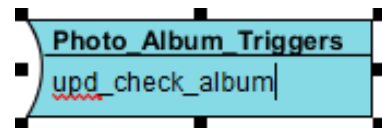Presentation Options

Creating a Trigger

1. Drag **Triggers** from diagram toolbar to diagram.
2. Name it.
3. Right click on the Triggers shape and select **New Trigger** from the popup menu.
4. Enter the physical name of the trigger.

Photo_Album_Triggers
upd_check_album
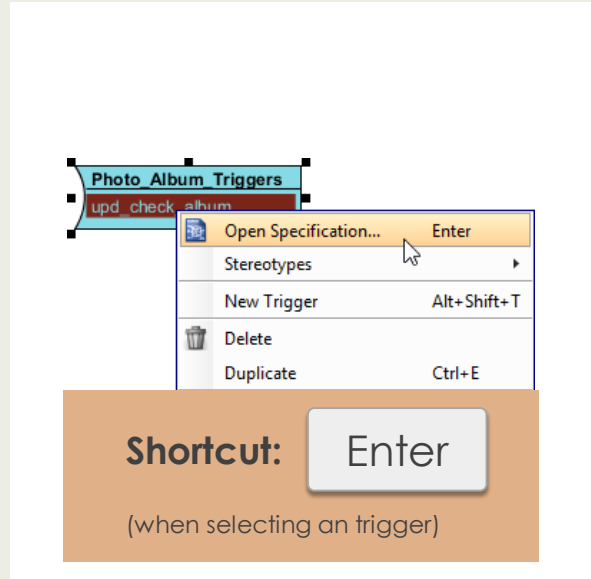
Creating a Trigger

1. Drag **Triggers** from diagram toolbar to diagram.

2. Name it.

3. Right click on the Triggers shape and select **New Trigger** from the popup menu.

4. Enter the physical name of the trigger.

5. Right click on the trigger and select **Open Specification...** from the popup menu.

Photo_Album_Triggers	
upd_check_album	

	Open Specification...	Enter
	Stereotypes	▶
	New Trigger	Alt+Shift+T
🗑	Delete	
	Duplicate	Ctrl+E

Shortcut: | Enter

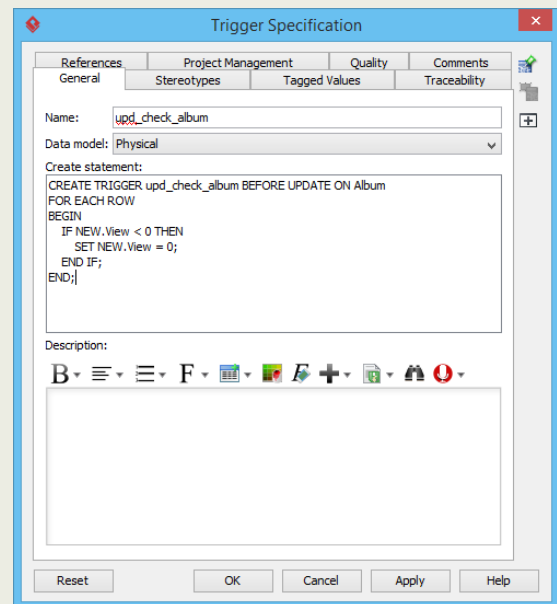(when selecting an trigger)

Creating a Trigger

1. Drag **Triggers** from diagram toolbar to diagram.

2. Name it.

3. Right click on the Triggers shape and select **New Trigger** from the popup menu.

4. Enter the physical name of the trigger.

5. Right click on the trigger and select **Open Specification...** from the popup menu.

6. Enter the **Create statement** of trigger.

Trigger Specification

References | Project Management | Quality | Comments
General | Stereotypes | Tagged Values | Traceability

Name: upd_check_album

Data model: Physical

Create statement:

```
CREATE TRIGGER upd_check_album BEFORE UPDATE ON Album
FOR EACH ROW
BEGIN
   IF NEW.View < 0 THEN
     SET NEW.View = 0;
   END IF;
END;
```

Description:

Reset | OK | Cancel | Apply | Help

Creating a Trigger

1. Drag **Triggers** from diagram toolbar to diagram.

2. Name it.

3. Right click on the Triggers shape and select **New Trigger** from the popup menu.

4. Enter the physical name of the trigger.

5. Right click on the trigger and select **Open Specification…** from the popup menu.

6. Enter the **Create statement** of trigger.

7. Click **OK** to confirm editing.

A stored procedure is a pre-written procedure code that allows you to execute over and over again for validation or quick retrieval of data.

Sample Usage – Querying Data

ID	MemberID	Title	Privacy	View	
1	3001	The tram	Public	19,128	
2	3001	Little kitten	Public	15,121	
3	3001	Chamomile	Only You	2	
4	3001	New bus route	Friends	4	
5	3002	Ferry pier 9	Public	12,220	
6	3002	The coast	Friends	8	
7	3002	Rock climbing	Public	12,000	
8	3003	Fountain	Friends	3	
9	3003	Sunset	Friends	5	

Let's take a look at this table. This is the Photo table, with all photos listed.

Sample Usage – Querying Data

ID	MemberID	Title	Privacy	View	
1	3001	The tram	Public	19,128	
2	3001	Little kitten	Public	15,121	
3	3001	Chamomile	Only You	2	
4	3001	New bus route	Friends	4	
5	3002	Ferry pier 9	Public	12,220	
6	3002	The coast	Friends	8	
7	3002	Rock climbing	Public	12,000	
8	3003	Fountain	Friends	3	
9	3003	Sunset	Friends	5	

These photos are uploaded by different members, identified by their IDs.

Sample Usage – Querying Data

ID	MemberID	Title	Privacy	View	
1	3001	The tram	Public	19,128	
2	3001	Little kitten	Public	15,121	
3	3001	Chamomile	Only You	2	
4	3001	New bus route	Friends	4	
5	3002	Ferry pier 9	Public	12,220	
6	3002	The coast	Friends	8	
7	3002	Rock climbing	Public	12,000	
8	3003	Fountain	Friends	3	
9	3003	Sunset	Friends	5	

The photos have different levels of privacy – public, only you (private) and friends.
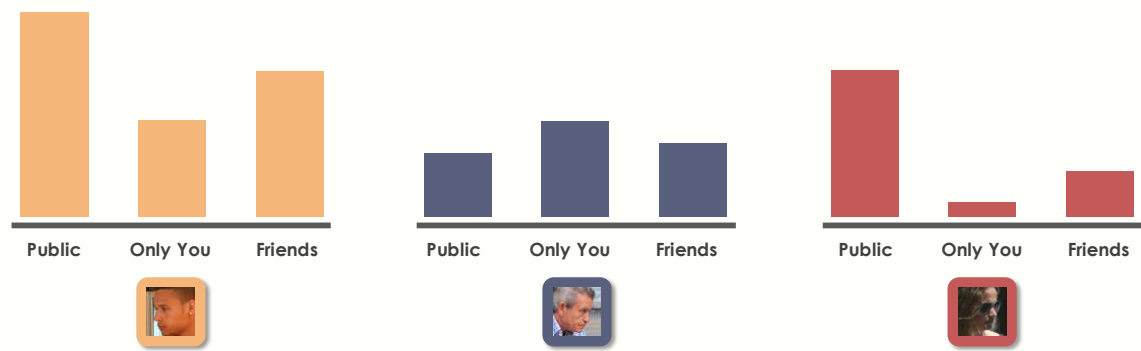
Sample Usage – Querying Data

ID	MemberID	Title	Privacy	View	
1	3001	The tram	Public	19,128	
2	3001	Little kitten	Public	15,121	
3	3001	Chamomile	Only You	2	
4	3001	New bus route	Friends	4	
5	3002	Ferry pier 9	Public	12,220	
6	3002	The coast	Friends	8	
7	3002	Rock climbing	Public	12,000	
8	3003	Fountain	Friends	3	
9	3003	Sunset	Friends	5	

and the number of view for each photo is stored in the View column.
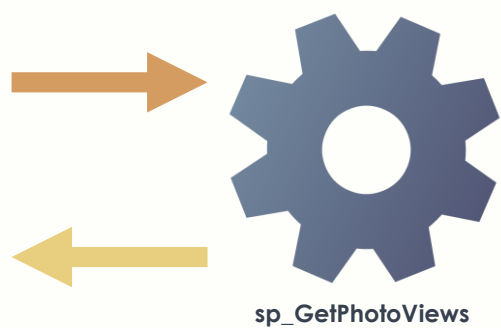
Sample Usage – Querying Data

Photo view count

If now you want to retrieve the photo view count of different members, categorized by the privacy of photo…

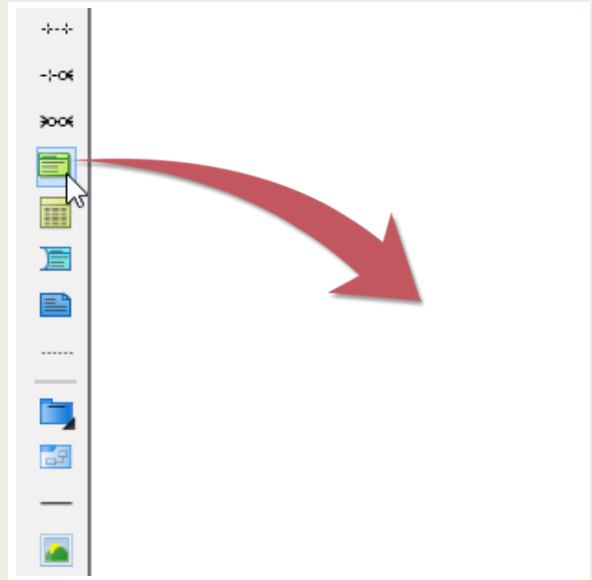Triggers and Stored Procedures

Sample Usage – Querying Data

sp_GetPhotoViews

MemberID	Public_Count	Only_You_Count	Friend_Count
3001	34249	2	4
3002	24220	0	8
3003	0	0	8

You can write a procedure to return the resultset you need. By executing the procedure you will get the data you need easily.

Triggers and Stored Procedures
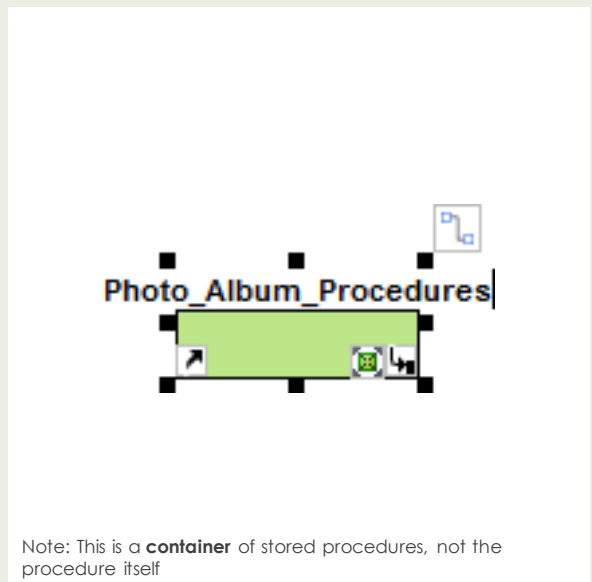
Creating a Procedure

1. Drag **Stored Procedures** from diagram toolbar to diagram.

Creating a Procedure

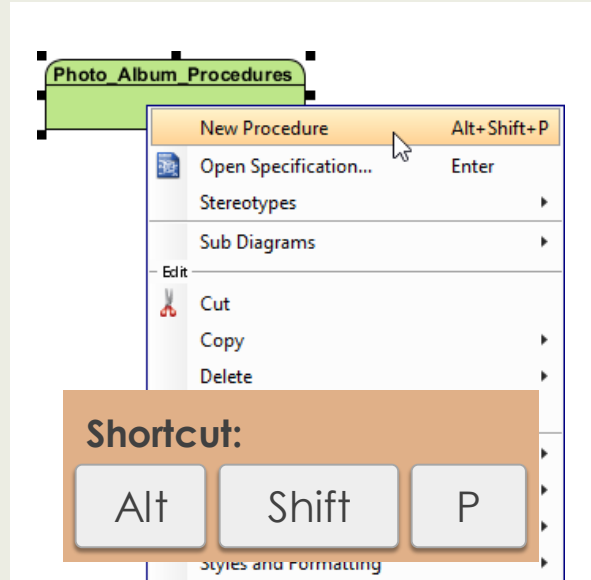1. Drag **Stored Procedures** from diagram toolbar to diagram.
2. Name it.

Photo_Album_Procedures

Note: This is a **container** of stored procedures, not the procedure itself

Creating a Procedure

1. Drag **Stored Procedures** from diagram toolbar to diagram.

2. Name it.

3. Right click on the Procedures shape and select **New Procedure** from the popup menu.

Photo_Album_Procedures

New Procedure	Alt+Shift+P
Open Specification...	Enter
Stereotypes	▶
Sub Diagrams	▶

Edit

| Cut |
| Copy | ▶ |
| Delete | ▶ |

Shortcut:

| Alt | Shift | P |

Styles and Formatting

Creating a Procedure

1. Drag **Stored Procedures** from diagram toolbar to diagram.

2. Name it.

3. Right click on the Procedures shape and select **New Procedure** from the popup menu.

4. Enter the physical name of the procedure .

Photo_Album_Procedures
sp_GetPhotoViews
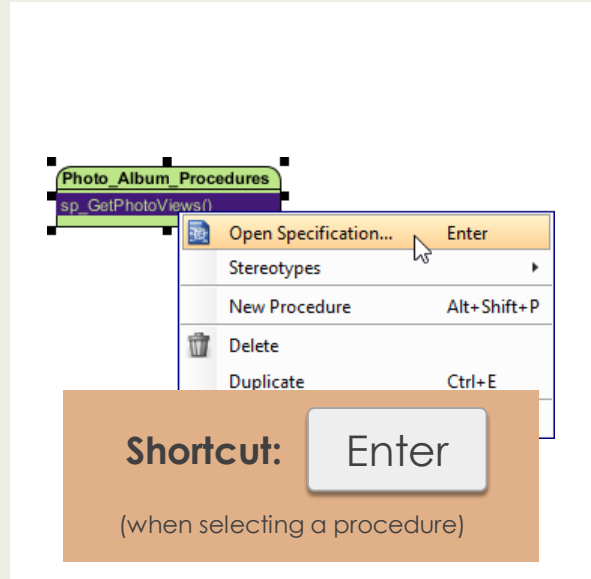
Creating a Procedure

1. Drag **Stored Procedures** from diagram toolbar to diagram.

2. Name it.

3. Right click on the Procedures shape and select **New Procedure** from the popup menu.

4. Enter the physical name of the procedure .

5. Right click on the procedure and select **Open Specification…** from the popup menu.

Photo_Album_Procedures
sp_GetPhotoViews()

Open Specification...	Enter
Stereotypes	▶
New Procedure	Alt+Shift+P
Delete	
Duplicate	Ctrl+E

Shortcut: Enter

(when selecting a procedure)
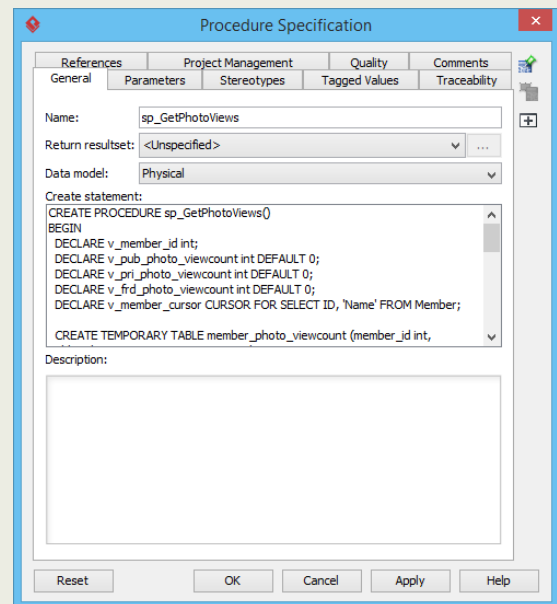

Creating a Procedure

1. Drag **Stored Procedures** from diagram toolbar to diagram.

2. Name it.

3. Right click on the Procedures shape and select **New Procedure** from the popup menu.

4. Enter the physical name of the procedure .

5. Right click on the procedure and select **Open Specification…** from the popup menu.

6. Enter the **Create statement** of procedure .

Procedure Specification

| References | Project Management | Quality | Comments |
| General | Parameters | Stereotypes | Tagged Values | Traceability |

Name: sp_GetPhotoViews
Return resultset: <Unspecified>
Data model: Physical

Create statement:
```
CREATE PROCEDURE sp_GetPhotoViews()
BEGIN
  DECLARE v_member_id int;
  DECLARE v_pub_photo_viewcount int DEFAULT 0;
  DECLARE v_pri_photo_viewcount int DEFAULT 0;
  DECLARE v_frd_photo_viewcount int DEFAULT 0;
  DECLARE v_member_cursor CURSOR FOR SELECT ID, 'Name' FROM Member;

  CREATE TEMPORARY TABLE member_photo_viewcount (member_id int,
```

Description:

| Reset | OK | Cancel | Apply | Help |

Creating a Procedure

```
CREATE PROCEDURE sp_GetPhotoViews()
BEGIN
 DECLARE v_member_id int;
 DECLARE v_pub_photo_viewcount int DEFAULT 0;
 DECLARE v_pri_photo_viewcount int DEFAULT 0;
 DECLARE v_frd_photo_viewcount int DEFAULT 0;
 DECLARE v_member_cursor CURSOR FOR SELECT ID, 'Name' FROM Member;

 CREATE TEMPORARY TABLE member_photo_viewcount (member_id int, public_photo_viewcount int, private_photo_viewcount int, friends_photo_viewcount int);

 OPEN v_member_cursor;

 FETCH v_member_cursor into v_member_id;
 BEGIN
  SELECT SUM('View') INTO v_pub_photo_viewcount FROM Photo WHERE Privacy = 'Public' AND MemberID = member_id;
  SELECT SUM('View') INTO v_pri_photo_viewcount FROM Photo WHERE Privacy = 'Only You' AND MemberID = member_id;
  SELECT SUM('View') INTO v_frd_photo_viewcount FROM Photo WHERE Privacy = 'Friends' AND MemberID = member_id;

  INSERT INTO member_photo_viewcount VALUES (v_member_id, v_pub_photo_viewcount, v_pri_photo_viewcount, v_frd_photo_viewcount);
  FETCH v_member_cursor into v_member_id;
 END;

 CLOSE v_member_cursor;

 SELECT * FROM member_photo_viewcount;
 DROP TABLE member_photo_viewcount;
END
```

Creating a Procedure

1. Drag **Stored Procedures** from diagram toolbar to diagram.

2. Name it.

3. Right click on the Procedures shape and select **New Procedure** from the popup menu.

4. Enter the physical name of the procedure.

5. Right click on the procedure and select **Open Specification…** from the popup menu.

6. Enter the **Create statement** of procedure.

7. Click **OK** to confirm editing.

Summary

- What is a trigger?
- How to create a trigger?
- What is a stored procedure?
- How to create a procedure?