

Lab 9 Triggers

Point Distribution:

Question Number	Points
1	0.8pt x 10
2a, 3a	6 pts + 5 pts
2b, 2c, 2d, 3b, 3c, 3d	1 pt x 6
Total	25pt

Submission:

- If you decide to skip the lab, make sure you submit the **check-off questions** (highlighted with green background) in the text box of the check-off assignment item for this Lab before **Wednesday, noon to Brightspace**.
- All students are expected to submit your answers in a text document with the name <lastname>_<firstname>_lab9.sql or .txt by the due date to Gradescope.**
- Please include both your code and the results in the **.txt** or **.sql** documents for full credits. For detailed requirements, please refer to the "Lab and Homework Submission Guideline."

Questions

Triggers	
1a	Execute the following statement to create a table named LAB9_EMPLOYEE by copying the Eagle Electronics EMPLOYEE table in your schema. CREATE TABLE LAB9_EMPLOYEE AS SELECT * FROM EMPLOYEE;
1b	<p>Create a trigger named TBDS_LAB9_EMPLOYEE on the LAB9_EMPLOYEE table that will fire <u>once</u> before data is deleted from the table, as shown below.</p> <div> <div>Worksheet</div> <div>Query Builder</div> <pre> 1 CREATE OR REPLACE TRIGGER TBDS_LAB10_EMPLOYEE 2 BEFORE DELETE ON LAB10_EMPLOYEE 3 BEGIN 4 DBMS_OUTPUT.PUT_LINE('Trigger fired before deleting anything from LAB10_EMPLOYEE'); 5 END;</pre> </div> <p>What is the database object upon which this trigger is defined? What is the timing of the trigger?</p>
1c	Create a trigger named TBDR_LAB9_EMPLOYEE on the LAB9_EMPLOYEE table that will fire <u>before each row</u> of data is deleted from the table, as shown below.

	<div> <div>WorksheetQuery Builder</div> <pre> 1 CREATE OR REPLACE TRIGGER TBDR_LAB10_EMPLOYEE 2 BEFORE DELETE ON LAB10_EMPLOYEE 3 FOR EACH ROW 4 BEGIN 5 DBMS_OUTPUT.PUT_LINE('Trigger fired before deleting a row from LAB10_EMPLOYEE'); 6 END;</pre> </div> <p>What is the database object upon which this trigger is defined? What is the timing of the trigger?</p>
1d	<p>Create a trigger named TADS_LAB9_EMPLOYEE on the LAB9_EMPLOYEE table that will fire <u>once</u> after data is deleted from the table, as shown below.</p> <div> <div>WorksheetQuery Builder</div> <pre> 1 CREATE OR REPLACE TRIGGER TADS_LAB10_EMPLOYEE 2 AFTER DELETE ON LAB10_EMPLOYEE 3 BEGIN 4 DBMS_OUTPUT.PUT_LINE('Trigger fired after deleting anything from LAB10_EMPLOYEE'); 5 END;</pre> </div> <p>What is the database object upon which this trigger is defined? What is the timing of the trigger?</p>
1e	<p>Create a trigger named TADR_LAB9_EMPLOYEE on the LAB9_EMPLOYEE table that will fire <u>after each row</u> of data is deleted from the table, as shown below.</p> <div> <div>WorksheetQuery Builder</div> <pre> 1 CREATE OR REPLACE TRIGGER TADR_LAB10_EMPLOYEE 2 AFTER DELETE ON LAB10_EMPLOYEE 3 FOR EACH ROW 4 BEGIN 5 DBMS_OUTPUT.PUT_LINE('Trigger fired after deleting a row from LAB10_EMPLOYEE'); 6 END;</pre> </div> <p>What is the database object upon which this trigger is defined? What is the timing of the trigger?</p>
1f	<p>Delete the record associated with Employee ID '101135' from the LAB9_EMPLOYEE table. Include both the code and the results in your submission.</p> <p>Which trigger(s) fired? For each that fired, how many times did it fire? If more than one fired, what was the sequence in which they fired?</p>
1g	<p>Attempt to rollback the deletion. Is the data restored? Does trigger execution implicitly perform a commit?</p>
1h	<p>Delete all employees with the job title 'Sales' from the LAB9_EMPLOYEE table. Include both the code and the results in your submission.</p>

	Which trigger(s) fired? For each that fired, how many times did it fire? If more than one fired, what was the sequence in which they fired?
1i	Again, attempt to rollback the deletion. Is the data restored this time? Is this what you expected?
1j	Truncate the LAB9_EMPLOYEE table. Include both the code and the results in your submission. Which trigger(s) fired? For each that fired, how many times did it fire? If more than one fired, what was the sequence in which they fired?
Creating Your Own Triggers	
2a	Create 4 triggers on the LAB9_EMPLOYEE table: <ul style="list-style-type: none"> • One which fires <u>once before</u> data is inserted into the table. • One which fires <u>before each row</u> of data is inserted into the table. • One which fires <u>after each row</u> of data has been inserted into the table. • One which fires <u>once after</u> data has been inserted into the table. Each trigger should simply provide a message to the user stating that it fired & when it did
2b	If you insert 1 row of data into the LAB9_EMPLOYEE table, which triggers do you expect to fire? For each that you expect to fire, how many times will it fire? What do you expect the firing sequence of the triggers to be? Note: this is your hypothesis. State it clearly in your submission.
2c	Test the hypothesis you developed in 2b by inserting 1 row of data. Include both the code and the results in your submission. Did your test support or disprove your hypothesis?
2d	If you were to insert 40 rows of data into the LAB9_EMPLOYEE table, which triggers do you expect to fire? For each that you expect to fire, how many times do you expect it fire? What do you expect the firing sequence of the triggers to be? Note: this is your hypothesis. State it clearly in your submission.
2e	Test the hypothesis you developed in 2d by inserting 40 rows of data (from employee table). Include both the code and the results in your submission. Did your test support or disprove your hypothesis?
Creating Your Own Trigger with Conditions	
3a	Create a trigger named RESTRICT_UPDATE on the LAB9_EMPLOYEE table. The trigger should <u>fire before each email address</u> is updated to check whether the new email address is valid. <ul style="list-style-type: none"> • If the new email address ends with '.com', proceed with the update. • If the new email address does NOT end with '.com', raise an application error to stop the trigger from firing. Create the trigger with a trigger WHEN clause.

3b	Test your trigger at least twice by updating the email address associated with the employeeID 100001 to: <ul style="list-style-type: none">• An invalid new email address (that does NOT end with '.com')• A valid new email address (that ends with '.com')
3c	Update the trigger to use an IF condition in the trigger body.
3d	Repeat question 3b to test your trigger with an invalid email and a valid email.
4	Please include the following code to the end of your submission. DROP TABLE LAB9_EMPLOYEE CASCADE CONSTRAINTS;