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| ***Computer Engineering Department*** |
| ***CE302L: Database Management Systems*** |

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| ***Course Instructor: Umer Farooq*** | ***Dated: January 10, 2022*** |
| ***Lab Engineer: Muhammad Usama Riaz*** | ***Semester: 5th*** |
| ***Session: 2019-2023*** | ***Batch: BSCE2019*** |

# Lab. 9 Triggers

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| **Name** | **Roll No** | **Lab Report Marks/100** | **Total Marks**  **(Scaled out of 10)** |
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Signature:

## 10.1 Objective

## The purpose this lab is to know how the triggers work, types of triggers, how to create a trigger and what are the uses of triggers.

## 10.2 Equipment and Component

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| **Component Description/Software** | **Value** | **Quantity** |
| Computer, MS SQL Server | On Campus | 1 |

## 10.3 Conduct of Lab

* + 1. Students are required to perform this experiment individually.
    2. In case the lab experiment is not understood, the students are advised to seek help from the course instructor, lab engineers, assigned teaching assistants (TA) and lab attendants.

## 10.4 Theory and Background

Triggers are special kind of stored procedures that automatically execute when a DML or DDL statement associated with the trigger is executed. Each trigger will be associated with one DML or DDL statement. Unlike stored procedure triggers cannot be executed directly by application/user, they will only be executed by DBMS in reaction to DML or DDL statement with which the trigger was associated.

## 10.5 Lab Task:

Schema is given in Lab10\_Script.sql file

Table

Description automatically generated

**Note: For Delete Triggers, Assume that only one row is deleted in one delete statement.**

1. Create an instead-of-delete trigger which does not allow deleting a customer who has made at least 1 order.
2. Create an instead-of-insert trigger for Order Details which checks whether the quantity in order details is less than or equal to the quantity in store. If the quantity in store is less, simply print some message on the screen and set the quantity equal to the quantity in store.
3. Create an after-delete trigger which does not allow deleting any item whose quantity in store is greater than 10.
4. Create an instead-of-insert trigger which checks whether the date of the order being inserted is equal to the current date or not. If it is not, simply replace the date with the current date.
5. Create an after-insert trigger which does not allow inserting a customer whose any of the fields is null.
6. You have to create a customer Signup procedure; it will take all the information of Customer (No, Name City, Phone).

At the end of procedure, it should return a flag (as output parameter) that should tell the violation of following rules:

* 1. Rule1: It should check that the customer No. is unique, so if any existing user has same user number it should return the Flag as 1.
  2. Rule 2: Phone number should be of 6 digits, if it’s less or more it should return the flag as 3.

If both the rules are satisfied then customer should be inserted, and Flag should be returned as 0. Write its Execute Statement as well

1. You have to create a store procedure to cancel an order. It should take customer number and order no as an input, if that customer has placed that order, then the order should be deleted along with all of its details. If the given order number does not belong to the given customer, it should print a message ‘Order no <as taken from input> is not of <CustomerNo><customerName>’ Write its Execute Statement as well
2. Create a procedure that returns StarCustomers. Star customers are the customers that have a purchase history Rs. 2000 or more.
3. Create a view that returns all the customers that have phone number not null. One with WITH CHECK option. Also create it without with check option.
   1. Now try to insert, delete and update though the view, and observe the results.

#### Assessment Rubrics for Lab

Method:Lab reports and instructor observation during lab sessions.

**Outcome assessed:**

a. Ability to conduct experiments, as well as to analyze and interpret data (P)

b. Ability to function on multi-disciplinary teams (A)

c. Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (P)

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| Performance metric | Mapping (task no. and description) | | Max marks | Exceeds expectation | Meets expectation | Does not meet expectation | Obtained marks |
| 1. Realization of experiment (a) | 1 | Functionality | 40 | Executes without errors excellent user prompts, good use of symbols, spacing in output. Through testing has been completed (45-41) | Executes without errors, user prompts are understandable, minimum use of symbols or spacing in output. Some testing has been completed (40-21) | Does not execute due to syntax errors, runtime errors, user prompts are misleading or non-existent. No testing has been completed (20-0) |  |
| 2. Teamwork (b) | 1 | Group Performance | 5 | Actively engages and cooperates with other group member(s) in effective manner (5-4) | Cooperates with other group member(s) in a reasonable manner but conduct can be improved (3-2) | Distracts or discourages other group members from conducting the experiment (1-0) |  |
| 3. Conducting experiment (a, c) | 1 | On Spot Changes | 10 | Able to make changes (5-4) | Partially able to make changes (3-2) | Unable to make changes (1-0) |  |
| 2 | Viva | 10 | Answered all questions (5-4) | Few incorrect answers (3-2) | Unable to answer all questions (1-0) |  |
| 4. Laboratory safety and disciplinary rules (a) | 1 | Code commenting | 5 | Observes lab safety rules; adheres to the lab disciplinary guidelines aptly (5-4) | Generally, observes safety rules and disciplinary guidelines with minor lapses (3-2) | Disregards lab safety and disciplinary rules (1-0) |  |
| 5. Data collection (c) | 1 | Code Structure | 5 | Excellent use of white space, creatively organized work, excellent use of variables and constants, correct identifiers for constants, No line-wrap (5-4) | Includes name, and assignment, white space makes the program fairly easy to read. Title, organized work, good use of variables (3-2) | Poor use of white space (indentation, blank lines) making code hard to read, disorganized and messy (1-0) |  |
| 6. Data analysis (a, c) | 1 | Algorithm | 20 | Solution is efficient, easy to understand, and maintain (5-4) | A logical solution that is easy to follow but it is not the most efficient (3-2) | A difficult and inefficient solution (1-0) |  |
| 7. Computer use (c) | 1 | Documentation | 5 | Timely documented (5-4) | Late documented (3-2) | Not documented (1-0) |  |
|  | Max Marks (total): | | 100 | Obtained Marks (Total): | | |  |

Lab Engineer Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_