MySQL Triggers – Validating Data (LAB Lecture)

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- **Triggers** in MySQL
- Syntax of Creating a **Trigger** in MySQL
- **Triggers** for
    1. Log of Record
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Why We Need Triggers in Database?

- Triggers are useful in many situations. Some of the main reasons for using triggers are:
  - Keeping a **Log of Records**
  - **Validating Input Data**
  - **Enforcing Business Rules**

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Syntax of Creating TRIGGER in MySQL

```
DELIMITER //
CREATE TRIGGER trigger_name
(BEFORE | AFTER) (INSERT | UPDATE | DELETE) ON table_name
FOR EACH ROW
BEGIN
    <Trigger Statements>
END//
DELIMITER ;
```

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Validating Input Data Scenario

- Suppose there is a table to store employees' data in our database.
- The **employee** table has a column named **Age** to store the age of employees.
- The **Age** column can not have negative values, so we are going to create a trigger that doesn't allow entering negative values in the **Age** column.
    - Whenever a user tries to **insert** a row in **Employee** table that contains negative number in **Age** column, the trigger **will generate an Error message** and doesn't allow the **insert** happens.

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Scenario 1 – Validating Input Data

Employee Table

EID	Ename	Age
1	Hasan	44
2	Lana	36

Employee Table

EID	Ename	Age
1	Hasan	44
2	Lana	36

insert into Employee(Ename, Age) **values** ('Kawa', - 70);

ERROR: Age Can not be Negative!

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Let's Create Database and Table

- Create a **Bank** database and activate it.
- Create **Employee** table.

Employee Table

EID	Ename	Age

```
create database bank;
use bank;

create table employee
(EID int auto_increment primary key,
Ename varchar(100),
age int);
```

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Validate_Age Trigger

- Create a **Trigger** on the **Employee** table, which is activated when any **insert** happens on the **Employee** table. The trigger checks the inserted value for the **Age** column, and if it is negative, it shows an Error message to the client and doesn't allow the insertion to happen.

```
DELIMITER $$
CREATE TRIGGER validate_age_tg
BEFORE INSERT ON Employee
FOR EACH ROW
BEGIN
    IF NEW.Age < 0 THEN
        SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = 'Age cannot be negative!' ;
    END IF;
END$$
DELIMITER ;
```

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Testing the Trigger

- Now you can test how the trigger works by executing an INSERT statement to enter a row with a negative **age** value into the **Employee** table.

```
INSERT INTO employee(Ename, Age) VALUES ('Hasan', 44);
INSERT INTO employee(Ename, Age) VALUES ('Lana', 36);
INSERT INTO employee(Ename, Age) VALUES ('Kawa', -70);
```

```
SELECT * FROM employee;
```

Scenario 2 – Validating Input Data

- Create a trigger that considers the following limitation whenever any update is going to happen in the **Employee** table.

Limitation for Age: **20 <= Age <= 50**

- This trigger considers the above limitation for **age**,
  - if the updated age becomes more than 50, the trigger sets the **Age** to 50,
  - if the updated age becomes less than 20, the trigger sets the **Age** to 20.

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Example 2

```
delimiter //
CREATE TRIGGER age_limitation_tg
BEFORE UPDATE ON employee
FOR EACH ROW
BEGIN
    IF NEW.age > 50 THEN SET NEW.age = 50;
    ELSEIF NEW.age < 20 THEN SET NEW.age = 20;
    END IF;
END//
delimiter ;
```

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Testing the Trigger

- Now you can test how the trigger works by executing UPDATE statements on the **Employee** table.

```
UPDATE Employee SET Age = 70 WHERE EID = 1;
UPDATE Employee SET Age = 45 WHERE EID = 2;
UPDATE Employee SET Age = 5 WHERE EID = 2;
```

```
SELECT * FROM Employee;
```

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