**Step 4**

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**NN: 142**

**#CONSTRAINT:**

**Constraint Syntax:**

**How constraint work?**

**Constraint Query:**

ALTER TABLE Expense

ADD CONSTRAINT CK\_ExpenseType142

CHECK (ExpenseType IN ('L', 'R')

OR

ExpenseType IS NULL);

**Result:**

Commands completed successfully.

**Tests for constraint:**

**1.Test 1**

**Query:**

Use KOT142;

INSERT INTO Expense (TripID, ExpenseNumber, ExpenseType, Date)

VALUES ('T142', 1 , 'A' , '2024-03-07' );

**Result:**

Msg 547, Level 16, State 0, Line 3

The INSERT statement conflicted with the CHECK constraint "CK\_ExpenseType142". The conflict occurred in database "KOT142", table "dbo.Expense", column 'ExpenseType'.

The statement has been terminated.

**2. Test 2**

**Query:**

Use KOT142;

INSERT INTO Expense (TripID, ExpenseNumber, ExpenseType, Date)

VALUES ('T142', 1 , 'L' , '2024-03-07' );

**Result:**

Msg 547, Level 16, State 0, Line 3

The INSERT statement conflicted with the FOREIGN KEY constraint "FK\_\_Expense\_\_TripID\_\_3F466844". The conflict occurred in database "KOT142", table "dbo.Trip", column 'TripID'.

The statement has been terminated.

**#TRIGGER**

**Trigger Syntax:**

**How trigger work?**

**Trigger Query:**

CREATE TRIGGER FuelMax142

ON RoadExpenses

FOR INSERT

AS

BEGIN

DECLARE @Cost Money;

DECLARE @errorMessage CHAR(70);

SELECT @Cost = ins.FuelCost

FROM inserted ins;

IF @Cost > 200

BEGIN

SET @errorMessage = 'Failure on insert. FuelCost cannot exceed 200. NN:142';

BEGIN TRY

BEGIN TRANSACTION;

RAISERROR(@errorMessage, 16, 1);

ROLLBACK TRANSACTION;

END TRY

BEGIN CATCH

IF @@TRANCOUNT > 0

BEGIN

ROLLBACK TRANSACTION;

END

PRINT @errorMessage;

END CATCH

END

END;

**Results:**

Commands completed successfully.

**Tests for trigger:**

(removed last entry for T012, from RoadExpenses Table, for testing purpose)

**1. Test 1**

**Query:**

Use KOT142;

INSERT INTO RoadExpenses (TripID, ExpenseNumber, FuelGallons, FuelCost)

VALUES ('T012', 2, 12, 280);

**Result:**

Failure on insert. FuelCost cannot exceed 200. NN:142

Msg 3609, Level 16, State 1, Line 3

The transaction ended in the trigger. The batch has been aborted.

**2. Test 2**

**Query:**

Use KOT142;

INSERT INTO RoadExpenses (TripID, ExpenseNumber, FuelGallons, FuelCost)

VALUES ('T012', 2, 10, 38.5000);

**Result:**

(1 row affected)

**This successfully updated the table by inserting the given data, as Cost<200.**

**#Stored Procedure**

**Query:**

CREATE PROCEDURE usp\_Truck142

@TruckID CHAR(5)

AS

BEGIN

SELECT MAX(IncomingMiles) AS HighestIncMileage

FROM Trip

WHERE TruckID = @TruckID;

END;

**Result:**

Commands completed successfully.

**Tests for stored procedure:**

**1. Test 1**

**Query:**

EXEC usp\_Truck142 @TruckID = 'B-002';

**Result:**

HighestIncMileage

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NULL

(1 row affected)

If we give TruckID not available in the table, it returns NULL value and does not produce error.

**2. Test 2**

**Query:**

EXEC usp\_Truck142 @TruckID = 'B-019';

**Result:**

HighestIncMileage

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27200

(1 row affected)

**3. Test 3**

**Query:**

EXEC usp\_Truck142 @TruckID = 'B-001';

**Result:**

HighestIncMileage

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3700

(1 row affected)

If multiple entries are present, it returns corresponding highest(maximum) values of incoming miles.

**4. Test 4**

**Query:**

EXEC usp\_Truck142 @TruckID = '';

**Result:**

HighestIncMileage

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NULL

(1 row affected)

If checked for empty values, it returns null and does not produce error.