

KELOMPOK 1 MBD A2

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1. Buat trigger `tr_UpdateAccountBalance_BeforeTransaction` ke tabel `transactions` yang akan mencegah transaksi dilakukan jika saldo akun tidak cukup. Jika `saldo < jumlah amount`, maka transaksi harus dibatalkan. Gunakan syntax `Rollback`.

```
CREATE TRIGGER tr_UpdateAccountBalance_BeforeTransaction
ON transactions
INSTEAD OF INSERT
AS
BEGIN
    DECLARE @account_id CHAR(36), @amount DECIMAL(18,2), @type_id INT, @balance DECIMAL(18,2);

    SELECT @account_id = account_id, @amount = amount, @type_id = transaction_type_id
    FROM inserted;

    SELECT @balance = balance FROM accounts WHERE account_id = @account_id;

    IF @type_id IN (2,3) AND @balance < @amount
    BEGIN
        RAISERROR ('Saldo tidak mencukupi untuk transaksi ini.', 16, 1);
        ROLLBACK TRANSACTION;
        RETURN;
    END

    INSERT INTO transactions
    SELECT * FROM inserted;
END

INSERT INTO transactions (transaction_id, account_id, transaction_type_id, amount, transaction_date)
VALUES (NEWID(), '07a36a4b-7943-4634-b17a-7c7eb4407cd3', 2, 1000000, GETDATE());
```

Messages

Msg 50000, Level 16, State 1, Procedure tr_UpdateAccountBalance_BeforeTransaction, Line 18 (Batch Start Line 30)
Saldo tidak mencukupi untuk transaksi ini.
Msg 3609, Level 16, State 1, Line 31
The transaction ended in the trigger. The batch has been aborted.

Completion time: 2025-05-22T23:17:56.5635927+07:00

2. Buat trigger `tr_Deposit_AfterTransaction` ke tabel `transactions` yang aktif jika ada transaksi transfer yang menambahkan transaksi baru ke akun tujuan (`reference_account`) dengan tipe transaksi deposit dan nilai `amount` yang sama.

```
CREATE TRIGGER tr_Deposit_AfterTransaction
ON transactions
AFTER INSERT
AS
BEGIN
    INSERT INTO transactions (
        transaction_id, account_id, transaction_type_id, amount, transaction_date, description
    )
    SELECT
        NEWID(), reference_account, 1, amount, GETDATE(),
        CONCAT('Transfer diterima dari ', account_id)
    FROM inserted
    WHERE transaction_type_id = 3;
END

INSERT INTO transactions (transaction_id, account_id, transaction_type_id, amount, transaction_date, reference_account)
VALUES (NEWID(), '1118a259-aa7d-402b-9f1f-72555ed15180', 3, 2000, GETDATE(), '1d97bce1-5c94-49e4-8e2a-6ad56b99afb0');
```

Messages

(1 row affected)
(1 row affected)
(1 row affected)

Completion time: 2025-05-22T23:57:31.9190041+07:00

| | transaction_id | account_id | transaction_type_id | amount | transaction_date | description | reference_account |
|----|--------------------------------------|---------------------------------------|---------------------|---------|-------------------------|---|---------------------------------------|
| 39 | 54efc385-e6b7-4ce4-9be8-42cc29398d38 | bff98bd-3931-4f9f-b0c1-63659797db5 | 2 | 118.34 | 2025-01-22 11:55:29.000 | Iustitiam quidem recte quis dixerit per se ipsa al | NULL |
| 40 | 583ebd92-6330-47e2-9115-c590b51238e9 | 92fabae-dab4-4737-8b26-ee60ed598cea | 2 | 81.82 | 2025-03-08 05:03:38.000 | Obruamus et secunda iucunde | NULL |
| 41 | 5b01a515-b320-4411-bc4d-03057bc38c8d | 17a9bd0a-5ed3-41d6-9e20-d434296c83d | 2 | 79.90 | 2025-03-10 08:51:11.000 | Postea variari voluptas distinguere possit augeri | NULL |
| 42 | 5ca3ef09-7b18-4782-a38a-9a621898b19 | 65a4514d-4bbb-4aed-b0e0-859e1bef135e | 2 | 118.80 | 2024-05-20 17:39:54.000 | ~ Filium morte multavit | NULL |
| 43 | 67648c15-25c2-4bb7-b7e6-9fb60f3b2d08 | 89a22c8c-57ba-4baa-8b71-13d1210a62d6 | 3 | 110.92 | 2024-12-25 22:44:11.000 | Quod semel admissum coerceri reprimique non potest | 3b525955-42f1-400a-aeaa-844422096ca |
| 44 | 693b5625-5527-43c2-9645-0e172aaea12f | 34e9be76-4674-4d0f-b7c0-a39e43548747 | 3 | 77.12 | 2025-01-26 00:17:49.000 | Ipsa quae qualisque sit ut tollatur error omnis im | f979d2d7-863e-448b-a0e8-3ea8d7bc79b6 |
| 45 | 6cd19fa-5d63-418a-83b7-34d6d8331cae | 80c28cdf-42b4-4232-bbd5-39404d8199c2 | 1 | 110.56 | 2024-07-23 22:00:22.000 | Quamquam autem et praeterita grate meminit et prae | NULL |
| 46 | 6d77ba74-b395-42c0-8e1a-0678b4ca127 | a9eb22fe-d2a1-4f58-b903-ba06bfab92ca | 2 | 79.35 | 2024-10-30 13:18:45.000 | Magna aliqua Ut enim ad minima veniam quis nostrud | NULL |
| 47 | 6DC0F3C0-4519-4DDC-82D5-440292037... | 1d97bce1-5c94-49e4-8e2a-6ad56b99afb0 | 1 | 2000.00 | 2025-05-22 23:57:31.867 | Transfer diterima dari 1118a259-aa7d-402b-9f1f-725... | NULL |
| 48 | 73046e7-0a12-4bae-a34d-2c1893ece2ce | b14faa6-c52c-4b4e-b785-543eeb1ec49c | 2 | 109.34 | 2024-10-20 04:34:34.000 | Quis dixerit per se laetitia id est | NULL |
| 49 | 7c019ea2-0a8d-4590-932e-de0037e89802 | 1118a259-aa7d-402b-9f1f-72555ed15180 | 2 | 93.12 | 2024-12-01 20:04:29.000 | Nos amice et benivole collegisti nec me tamen laud | NULL |
| 50 | 7d332d97-04e9-4737-8876-7b78dc39e96a | 789de90-5ef0-46cc-bb19-fbe4928474e6 | 3 | 102.24 | 2024-11-17 16:47:48.000 | Ostendit iudicia rerum diriguntur numquam ullius o | 8a392a96-c559-469b-835e-4a45c4ba85... |
| 51 | 80e62bc1-cb02-4cfd-bade-9ddaa0cae3f | c5001a9-441b-4a71-81c8-9f2a7828ba92 | 3 | 104.78 | 2024-08-05 16:26:55.000 | Repudiandae sint et molestiae non recusandae Itaqu | b6bba53f-da2c-4770-bb3b-ed83c51bf5bf |
| 52 | 82353c8f-c4ec-4e51-97d5-9d10146aa8fe | 58e3a89a-7549-4390-821e-d643a13d9c36 | 2 | 121.39 | 2024-11-30 05:45:24.000 | Loco videtur quibusdam stabilitas amicitiae vacill | NULL |
| 53 | 82eeeeef-d879-4084-9a37-9d170262395 | 1d97bce1-5c94-49e4-8e2a-6ad56b99afb0 | 1 | 88.98 | 2025-02-04 05:18:22.000 | Sibi quibus non solum praesentibus fruuntur sed et | NULL |
| 54 | 825404d8-1086-4a91-b397-22a982a136c2 | ee508747-fa8a1-432c-980f-388a4eb639fd | 3 | 115.66 | 2025-04-10 01:52:55.000 | Quodsi qui satis sibi contra hominum conscientiam | 6497ea37-1f6d-4d19-bf6b-9f0f63bba73 |

3. Buat trigger tr_LimitAccountsPerCustomer yang akan mencegah penambahan akun baru (accounts) jika seorang nasabah (customer_id) sudah memiliki 3 akun. Trigger ini dijalankan sebelum insert ke tabel accounts. Jika jumlah akun untuk customer_id ≥ 3 , maka transaksi dibatalkan. Gunakan syntax Rollback.

```

CREATE TRIGGER tr_LimitAccountsPerCustomer
ON accounts
INSTEAD OF INSERT
AS
BEGIN
    DECLARE @customer_id CHAR(36), @count INT;

    SELECT @customer_id = customer_id FROM inserted;

    SELECT @count = COUNT(*) FROM accounts WHERE customer_id = @customer_id;

    IF @count >= 3
    BEGIN
        RAISERROR('Customer sudah memiliki 3 akun. Tidak bisa menambahkan akun baru.', 16, 1);
        ROLLBACK TRANSACTION;
        RETURN;
    END

    INSERT INTO accounts
    SELECT * FROM inserted;

INSERT INTO accounts (account_id, customer_id, account_number, account_type, balance, created_at)
VALUES (NEWID(), '287bf982-89ce-44b5-bfdd-49407600309a', '1234567892', 'savings', 500000, GETDATE());

```

110 %

Messages

Msg 50000, Level 16, State 1, Procedure tr_LimitAccountsPerCustomer, Line 14 [Batch Start Line 84]
Customer sudah memiliki 3 akun. Tidak bisa menambahkan akun baru.

Msg 3603, Level 16, State 1, Line 85
The transaction ended in the trigger. The batch has been aborted.

Completion time: 2025-05-22T23:44:44.5751589+07:00

4. Buat trigger tr_BlockInvalidReferenceAccount pada tabel transactions yang aktif jika terdapat insert transaksi transfer, sistem harus mengecek apakah akun tujuan (reference_account) benar-benar ada di tabel accounts. Jika tidak ditemukan, batalkan transaksi. Gunakan syntax Rollback.

```
CREATE TRIGGER tr_BlockInvalidReferenceAccount
ON transactions
AFTER INSERT
AS
BEGIN
    IF EXISTS (
        SELECT 1
        FROM inserted i
        WHERE i.transaction_type_id = 3
        AND NOT EXISTS (
            SELECT 1 FROM accounts a WHERE a.account_id = i.reference_account
        )
    )
    BEGIN
        ROLLBACK TRANSACTION;
        THROW 50001, 'Akun tujuan transfer tidak valid.', 1;
    END
END

INSERT INTO transactions (transaction_id, account_id, transaction_type_id, amount, transaction_date, reference_account)
VALUES (NEWID(), '07a36a4b-7943-4634-b17a-7c7eb4407cd3', 3, 1000, GETDATE(), '0937445f-d5eb-4ef9-887f-5173fe662dds');
```

110 %
Messages
Msg 50001, Level 16, State 1, Procedure tr_BlockInvalidReferenceAccount, Line 16 [Batch Start Line 115]
Akun tujuan transfer tidak valid.
Completion time: 2025-05-23T00:03:46.2875174+07:00

5. Buat trigger tr_EnsureMinimumBalance di tabel transactions yang aktif saat transaksi withdrawal atau transfer dilakukan. Trigger harus memeriksa apakah saldo akun setelah transaksi memiliki minimal Rp100.000. Jika tidak, transaksi dibatalkan. Gunakan syntax Rollback.

```
CREATE TRIGGER tr_EnsureMinimumBalance
ON transactions
AFTER INSERT
AS
BEGIN
    IF EXISTS (
        SELECT 1
        FROM inserted i
        JOIN accounts a ON i.account_id = a.account_id
        WHERE i.transaction_type_id IN (2, 3)
        AND (a.balance - i.amount) < 100000
    )
    BEGIN
        ROLLBACK TRANSACTION;
        THROW 50002, 'Saldo setelah transaksi harus minimal Rp100.000.', 1;
    END
END

INSERT INTO transactions (transaction_id, account_id, transaction_type_id, amount, transaction_date)
VALUES (NEWID(), 'FECB4DA8-5502-44C6-867E-E67C6CC31D88', 2, 950000, GETDATE());
```

110 %
Messages
(0 rows affected)
Msg 50002, Level 16, State 1, Procedure tr_EnsureMinimumBalance, Line 15 [Batch Start Line 141]
Saldo setelah transaksi harus minimal Rp100.000.
Completion time: 2025-05-23T00:07:08.0585678+07:00