

TUGAS INDEX & POINTERS
PRAKTIKUM MATA KULIAH MANAJEMEN BASIS DATA
PERTEMUAN ke-4



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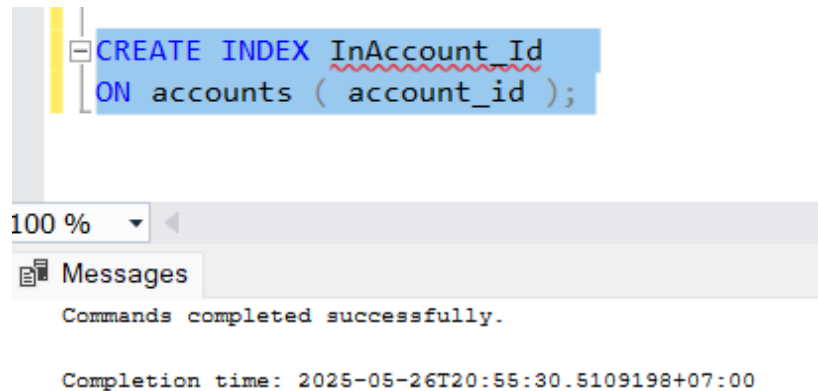
PROGRAM STUDI INFORMATIKA
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Buatlah kemudian aplikasikan query index & pointer untuk kasus berikut:

- I. Buatlah index pada tabel accounts untuk mempercepat pencarian. Pilih salah satu kolom pada table tersebut dan berikan alasan pemilihan kolom tersebut sebagai index!

- Query

```
CREATE INDEX InAccount_Id  
ON accounts ( account_id );
```
- Screenshot

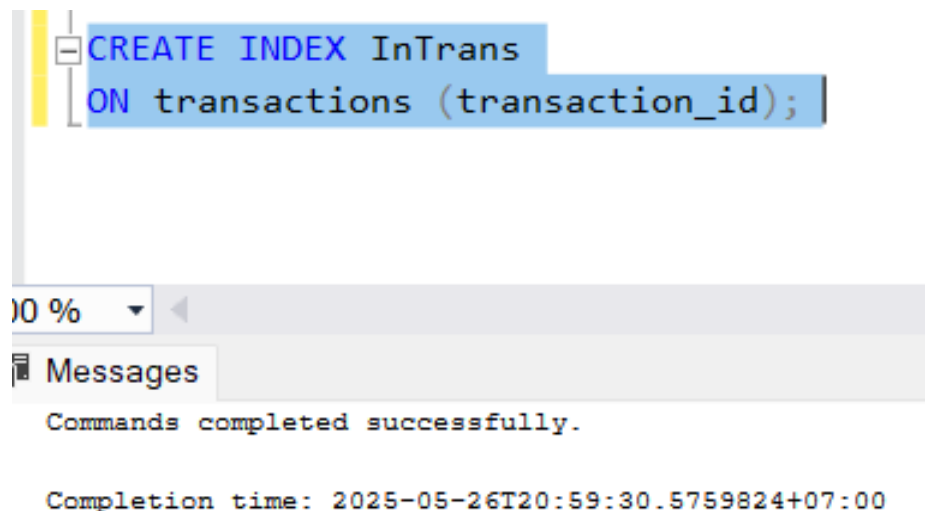


- Alasan
Indeks pada kolom account_id mempercepat pencarian data karena kolom ini unik dan sering digunakan dalam query. Tanpa indeks, pencarian bisa lambat karena harus membaca seluruh tabel. Dengan indeks, database langsung menemukan data yang dicari, membuat aplikasi lebih cepat dan responsif.

- II. Buatlah index pada tabel transactions untuk mempercepat pencarian. Pilih salah satu kolom pada table tersebut dan berikan alasan pemilihan kolom tersebut sebagai index!

- Query

```
CREATE INDEX InTrans  
ON transactions (transaction_id);
```
- Screenshot



- Alasan

Indeks pada kolom transaction_id sangat efektif untuk mempercepat pencarian data karena biasanya kolom ini bersifat unik dan sering digunakan dalam query pencarian atau penghubung dengan tabel lain. Tanpa indeks, database harus membaca seluruh tabel untuk menemukan transaksi tertentu, yang bisa lambat jika datanya besar. Dengan indeks, pencarian langsung menuju data yang dicari, membuat sistem lebih efisien.

III. Buatlah composite index pada tabel accounts. Pilih lebih dari satu kolom pada tabel tersebut dan uji performa query sebelum dan setelah menggunakan index! (query pengujian berdasarkan kolom yang dipilih sebagai index)

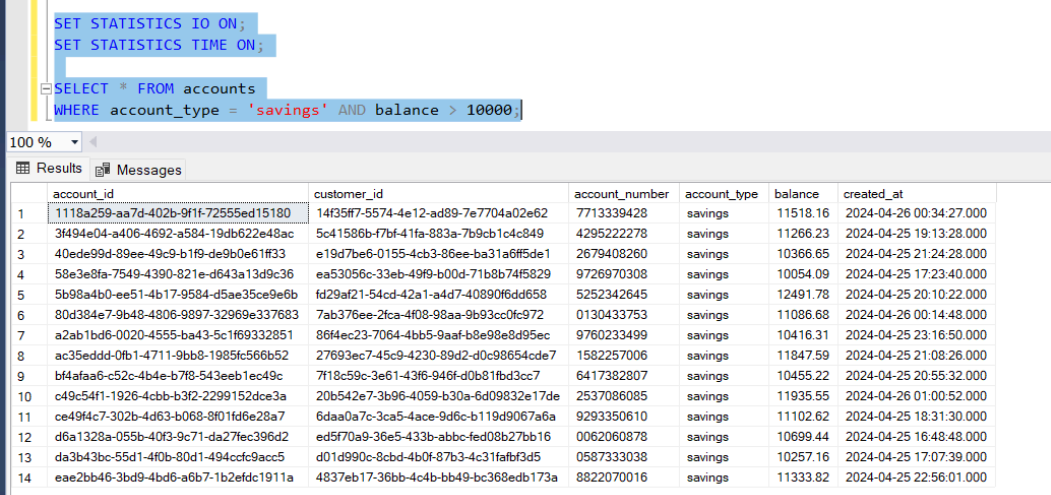
- Query

```
CREATE INDEX In_acc_type_balance
ON accounts(account_type, balance);
--Pemanggilan
SET STATISTICS IO ON;
SET STATISTICS TIME ON;

SELECT * FROM accounts
WHERE account_type = 'savings' AND balance > 10000;
```

- Screenshot

a) sebelum menggunakan index



	account_id	customer_id	account_number	account_type	balance	created_at
1	1118a259-aa7d-402b-9f1f-72555ed15180	14f35ff7-5574-4e12-ad89-7e7704a02e62	7713339428	savings	11518.16	2024-04-26 00:34:27.000
2	34494e04-a406-4692-a584-19db622e48ac	5c41586b-f7bf-41fa-883a-7b9cb1c4c849	4295222278	savings	11266.23	2024-04-25 19:13:28.000
3	40ede99d-89ee-49c9-b1f9-de9b0e61ff33	e19d7be6-0155-4cb3-86ee-ba31a6ff5de1	2679408260	savings	10366.65	2024-04-25 21:24:28.000
4	58e3e8fa-7549-4390-821e-d643a13d9c36	ea53056c-33eb-49f9-b00d-71b8b74f5829	9726970308	savings	10054.09	2024-04-25 17:23:40.000
5	5b98a4b0-ee51-4b17-9584-d5ae35ce9e6b	fd29af21-54cd-42a1-a4d7-40890f6dd658	5252342645	savings	12491.78	2024-04-25 20:10:22.000
6	80d384e7-9b48-4806-9897-32969e337683	7ab376ee-2fca-4f08-98aa-9b93cc0fc972	0130433753	savings	11086.68	2024-04-26 00:14:48.000
7	a2ab1bd6-0020-4555-ba43-5c1f69332851	86f4ec23-7064-4bb5-9aaf-b0e98e8d95ec	9760233499	savings	10416.31	2024-04-25 23:16:50.000
8	ac35eddd-0fb1-4711-9bb8-1985fc566b52	27693ec7-45c9-4230-89d2-d0c98654cde7	1582257006	savings	11847.59	2024-04-25 21:08:26.000
9	b44faaa6-c52c-4b4e-b7f8-543eeb1ec49c	7f18c59c-3e61-43f6-946f-d0b81fbd3cc7	6417382807	savings	10455.22	2024-04-25 20:55:32.000
10	c49c54f1-1926-4cbb-b3f2-2299152dce3a	20b542e7-3b96-4059-b30a-6d09832e17de	2537086085	savings	11935.55	2024-04-26 01:00:52.000
11	ce49f4c7-302b-4d63-b068-8f01fd6e28a7	6daa0a7c-3ca5-4ace-9d6c-b119d9067a6a	9293350610	savings	11102.62	2024-04-25 18:31:30.000
12	d6a1328a-055b-40f3-9c71-da27fec396d2	ed5f70a9-36e5-433b-abbcc-fed08b27bb16	0062060878	savings	10699.44	2024-04-25 16:48:48.000
13	da3b43bc-55d1-4f0b-80d1-494cfc9acc5	d01d990c-8cbd-4b0f-87b3-4c31fatbf3d5	0587333038	savings	10257.16	2024-04-25 17:07:39.000
14	eae2bb46-3bd9-4bd6-a6b7-1b2efdc1911a	4837eb17-36bb-4c4b-bb49-bc368edb173a	8822070016	savings	11333.82	2024-04-25 22:56:01.000

b) setelah menggunakan index



IV. Buat cursor untuk membaca semua akun dari tabel accounts, lalu periksa balance masing-masing. Jika $\text{balance} < 9.000$, tampilkan pesan: "Saldo rendah untuk `account_id`: [`account_id`]".

- Query

```
DECLARE @account_id CHAR(36);
DECLARE @balance DECIMAL(18,2);
```

```
DECLARE cur_kun_counts CURSOR
FOR
```

```
SELECT account_id, balance
FROM accounts;
```

```
OPEN cur_kun_counts
```

```

FETCH    NEXT    FROM    cur_kun_counts    INTO    @account_id,
@balance;

```

```
WHILE @@FETCH STATUS = 0
```

BEGIN

```
IF @balance < 9000
```

BEGIN

```
PRINT 'Saldo rendah untuk account_id: ' +
@account_id;
END
```

```

        FETCH NEXT FROM cur_kun_counts INTO @account_id,
        @balance;

```

END

```
CLOSE cur kun counts;
```

```
DEALLOCATE cur kun counts;
```

- Screenshoot

```

DECLARE @account_id CHAR(36);
DECLARE @balance DECIMAL(18,2);

DECLARE cur_kun_counts CURSOR
FOR
    SELECT account_id, balance
    FROM accounts;
OPEN cur_kun_counts
FETCH NEXT FROM cur_kun_counts INTO @account_id, @balance;

WHILE @@FETCH_STATUS = 0
BEGIN
    IF @balance < 9000
    BEGIN
        PRINT 'Saldo rendah untuk account_id: ' + @account_id;
    END

    FETCH NEXT FROM cur_kun_counts INTO @account_id, @balance;
END

CLOSE cur_kun_counts;
DEALLOCATE cur_kun_counts;

```

```

SQL Server Execution Times:
    CPU time = 0 ms,  elapsed time = 1 ms.

```

```

SQL Server Execution Times:
    CPU time = 0 ms,  elapsed time = 0 ms.

```

```

SQL Server Execution Times:
    CPU time = 0 ms,  elapsed time = 0 ms.
Saldo rendah untuk account_id: 1d97bce1-5c94-49e4-8e2a-6ad56b99afb0

```

```

SQL Server Execution Times:
    CPU time = 0 ms,  elapsed time = 0 ms.
Table 'Worktable'. Scan count 0, logical reads 2, physical reads 0, page server reads 0, read-ahead reads 0, page
Table 'accounts'. Scan count 1, logical reads 1, physical reads 0, page server reads 0, read-ahead reads 0, page s

```

```

SQL Server Execution Times:
    CPU time = 0 ms,  elapsed time = 0 ms.

```

```

SQL Server Execution Times:
    CPU time = 0 ms,  elapsed time = 0 ms.

```

100 %

- V. Buat cursor untuk membaca semua pelanggan (customers) dan gabungkan first_name dan last_name untuk ditampilkan dengan format: "Customer: [Nama Lengkap]".

- Query

```

DECLARE @first_name VARCHAR(50);
DECLARE @last_name VARCHAR(50);

```

```

DECLARE cur_customers CURSOR
FOR
    SELECT first_name, last_name
    FROM customers;

```

```

OPEN cur_customers;
FETCH NEXT FROM cur_customers INTO @first_name,
@last_name;
WHILE @@FETCH_STATUS = 0

```

```

BEGIN
    PRINT 'Customer: ' + @first_name + ' ' + @last_name;

    FETCH NEXT FROM cur_customers INTO @first_name,
@last_name;
END
CLOSE cur_customers;
DEALLOCATE cur_customers;

```

- Screenshot

```

DECLARE @first_name VARCHAR(50);
DECLARE @last_name VARCHAR(50);

DECLARE cur_customers CURSOR
FOR
    SELECT first_name, last_name
    FROM customers;

OPEN cur_customers;
FETCH NEXT FROM cur_customers INTO @first_name, @last_name;
WHILE @@FETCH_STATUS = 0
BEGIN
    PRINT 'Customer: ' + @first_name + ' ' + @last_name;

    FETCH NEXT FROM cur_customers INTO @first_name, @last_name;
END
CLOSE cur_customers;
DEALLOCATE cur_customers;

```

SQL Server Execution Times:

CPU time = 0 ms, elapsed time = 0 ms.

Table 'Worktable'. Scan count 0, logical reads 2, physical reads 0, page server reads 0, read

Table 'customers'. Scan count 1, logical reads 1, physical reads 0, page server reads 0, read

SQL Server Execution Times:

CPU time = 0 ms, elapsed time = 0 ms.

SQL Server Execution Times:

CPU time = 0 ms, elapsed time = 0 ms.

Customer: Buddie Sandison

SQL Server Execution Times:

CPU time = 0 ms, elapsed time = 0 ms.

Table 'Worktable'. Scan count 0, logical reads 2, physical reads 0, page server reads 0, read

Table 'customers'. Scan count 1, logical reads 1, physical reads 0, page server reads 0, read

SQL Server Execution Times:

CPU time = 0 ms, elapsed time = 0 ms.

SQL Server Execution Times:

CPU time = 0 ms, elapsed time = 0 ms.

Customer: Stephanus Frear

SQL Server Execution Times:

100 0%