

TUGAS BESAR MANAJEMEN BASIS DATA



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DAFTAR PUSTAKA

BAB I STUDI LITERATUR

1.1 Tunning : Indexing

Pengindeksan adalah cara untuk mengoptimalkan kinerja database dengan meminimalkan jumlah akses disk yang diperlukan saat permintaan diproses. Ini adalah teknik struktur data yang digunakan untuk mencari dan mengakses data dalam database dengan cepat.

Indeks dibuat menggunakan beberapa kolom basis data.

Kolom pertama adalah kunci pencarian yang berisi salinan kunci utama atau kunci kandidat dari tabel. Nilai-nilai ini disimpan dalam urutan diurutkan sehingga data yang sesuai dapat diakses dengan cepat.

Catatan: Data mungkin atau mungkin tidak disimpan dalam urutan diurutkan.

Kolom kedua adalah Referensi Data atau Pointer yang berisi seperangkat pointer yang menyimpan alamat blok disk tempat nilai kunci tertentu dapat ditemukan.

1.2 Tunning : Setting Configuration DBMS

Persyaratan tuning juga harus mencatat konfigurasi perangkat keras dan perangkat lunak yang akan dilakukan tuning. Hal ini membantu pada saat akan melakukan tuning. Perangkat lunak yang dimaksud itu mencakup juga Database Management Server yang digunakan. Performansi dapat dipengaruhi oleh desain fisik database, termasuk normalisasi dan penyimpanan disk, jumlah table, desain indexes, dan penggunaan DDL serta parameter terkait.

BAB II DESKRIPSI PERCOBAAN

2.1 Tunning : Index

Pada database yang telah disediakan, lakukan beberapa indexing pada beberapa field pada table student dan section.

```
Database Changed
MariaDB [dms1]> create index section_pk on section(sec_id);
ERROR 1061 (42000): Duplicate key name 'section_pk'
MariaDB [dms1]> create index student_pk on student(name);
Query OK, 0 rows affected (1.67 sec)
Records: 0 Duplicates: 0 Warnings: 0
MariaDB [dms1]>
```

Gambar 1.Index pada database dms 1

```
MariaDB [dms2]> create index section_pk on section(sec_id);
ERROR 1061 (42000): Duplicate key name 'section_pk'
MariaDB [dms2]> create index student_pk on student(name);
Query OK, 0 rows affected (1.96 sec)
Records: 0 Duplicates: 0 Warnings: 0
MariaDB [dms2]>
```

Gambar 2.Index pada database dms 2

```
Database Changed
MariaDB [dms3]> create index section_pk on section(sec_id);
ERROR 1061 (42000): Duplicate key name 'section_pk'
MariaDB [dms3]> create index student_pk on student(name);
Query OK, 0 rows affected (1.77 sec)
Records: 0 Duplicates: 0 Warnings: 0
MariaDB [dms3]>
```

Gambar 3.Index pada database dms 3

```
MariaDB [dms4]> create index section_pk on section(sec_id);
ERROR 1061 (42000): Duplicate key name 'section_pk'
MariaDB [dms4]> create index student_pk on student(name);
Query OK, 0 rows affected (2.38 sec)
Records: 0 Duplicates: 0 Warnings: 0
MariaDB [dms4]> _
```

Gambar 4.Index pada database dms 4

Kemudian eksekusilah query pada saat sebelum melakukan pengindexan dan setelah melakukan pengindexan.

Berikut adalah query :

1. SELECT * FROM student
2. SELECT * FROM student WHERE tot_cred > 30
3. SELECT dept_name FROM student WHERE tot_cred > 30
4. SELECT * FROM takes JOIN student ON takes.ID = student.ID JOIN section ON takes.course_id = section.course_id
5. SELECT student.`name`,student.dept_name,takes.sec_id AS pengambilan,takes.semester,section.room_number,section.building ,course.course_id,course.dept_name FROM takes JOIN student ON takes.ID = student.ID JOIN section ON takes.course_id = section.course_id JOIN course ON section.course_id = course.course_id

```

ERROR 1213 (42000): Variable 'profiling' can't be set to the value of '2'
MariaDB [dms1]> set profiling=0
Query OK, 0 rows affected (0.00 sec)

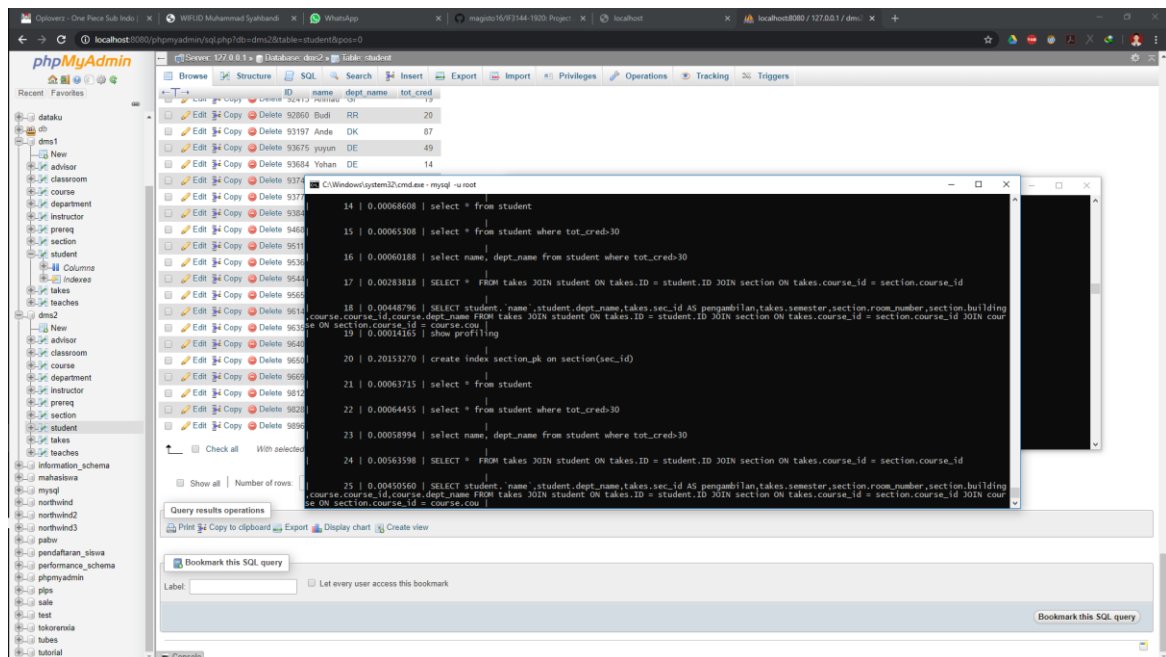
MariaDB [dms1]> set profiling=1
Query OK, 0 rows affected (0.00 sec)

MariaDB [dms1]> show profiling;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'profiling' at line 1
MariaDB [dms1]> show profiling;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'profiling' at line 1
MariaDB [dms1]> show profiles;
+-----+-----+-----+
| Query_ID | Duration | Query |
+-----+-----+-----+
| 1 | 0.00056149 | select * from student |
| 2 | 0.00060587 | select * from student where tot_cred > 30 |
| 3 | 0.00021145 | select 'name', department from student |
| 4 | 0.00038514 | select name, department from student |
| 5 | 0.00051865 | select 'name', 'department' from student |
| 6 | 0.00060359 | select name,dept_name from student |
| 7 | 0.00308736 | select * from takes join student on takes.ID = student.ID |
| 8 | 0.00102722 | select student.name, student.dept_name, takes.sec_id AS pengambilan, takes.semester, section.room_number, section.building, section.course_id, section.dept_name FROM takes join student on takes.ID = student.ID join section on takes.course_id = section.course_id join course on section.course_id = course.course_id |
| 9 | 0.00021184 | set profiling=2 |
| 10 | 0.0009216 | show profiling |
| 11 | 0.00016384 | show profiling |
| 12 | 0.0007908 | show profiling |
+-----+-----+-----+
12 rows in set (0.00 sec)

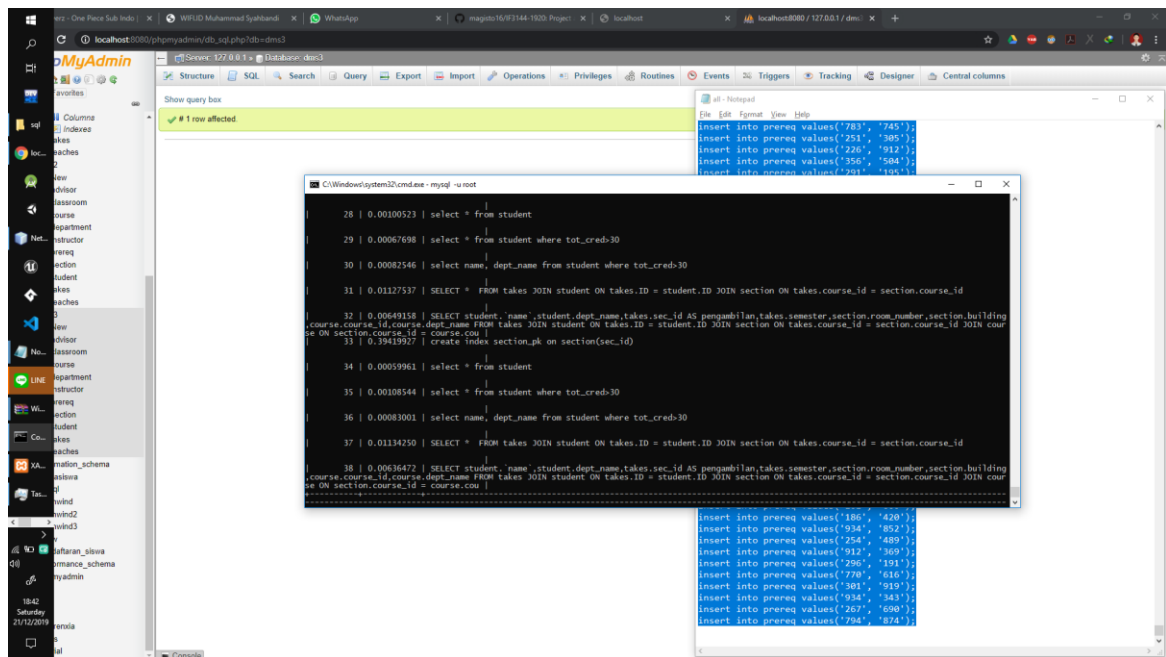
MariaDB [dms1]> show profiles;
+-----+-----+-----+
| Query_ID | Duration | Query |
+-----+-----+-----+
| 1 | 0.00029468 | select * from student |
| 2 | 0.00054386 | select * from student where tot_cred > 30 |
| 3 | 0.00057913 | select name, dept_name from student |
| 4 | 0.00130844 | SELECT * FROM takes JOIN student ON takes.ID = student.ID JOIN section ON takes.course_id = section.course_id |
| 5 | 0.00118841 | SELECT student.`name`,student.dept_name,takes.sec_id AS pengambilan,takes.semester,section.room_number,section.building ,course.course_id,course.dept_name FROM takes JOIN student ON takes.ID = student.ID JOIN section ON takes.course_id = section.course_id JOIN course ON section.course_id = course.course_id |
| 6 | 1.03262375 | create index section_pk on section(sec_id) |
| 7 | 0.00030379 | select * from student |
| 8 | 0.00030037 | select * from student where tot_cred > 30 |
| 9 | 0.00050347 | select name, dept_name from student |
| 10 | 0.00146773 | SELECT * FROM takes JOIN student ON takes.ID = student.ID JOIN section ON takes.course_id = section.course_id |
| 11 | 0.00244281 | SELECT student.`name`,student.dept_name,takes.sec_id AS pengambilan,takes.semester,section.room_number,section.building ,course.course_id,course.dept_name FROM takes JOIN student ON takes.ID = student.ID JOIN section ON takes.course_id = section.course_id JOIN course ON section.course_id = course.course_id |
+-----+-----+-----+

```

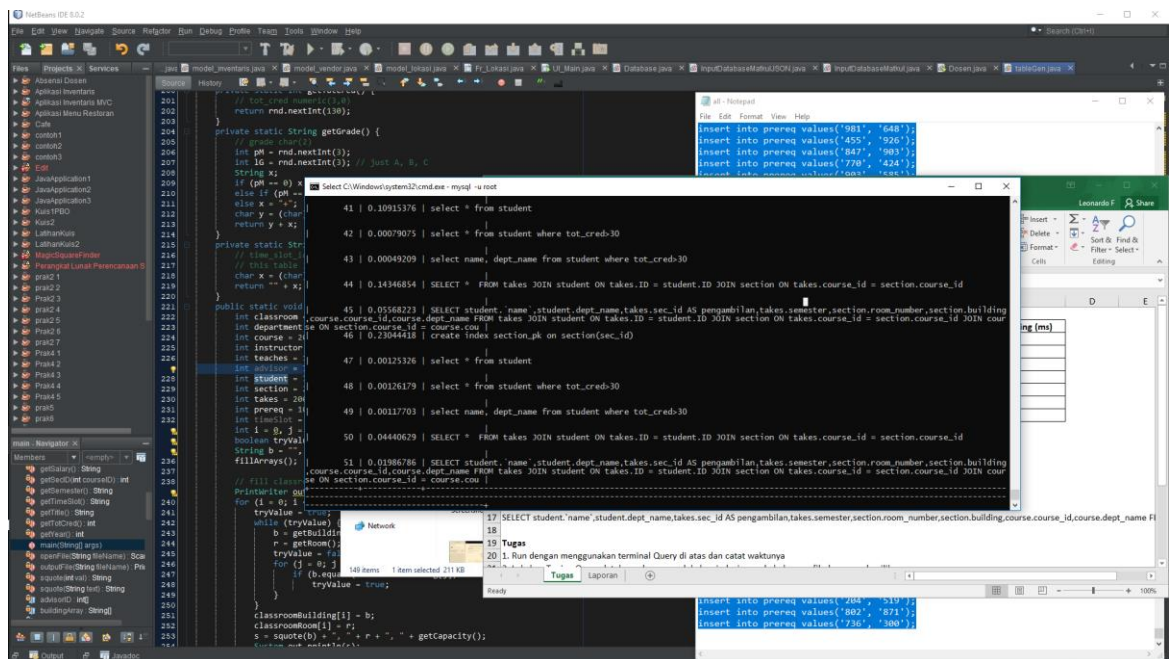
Gambar 1. Hasil waktu query pada database dms 1



Gambar 2. Hasil waktu query pada database dms 2



Gambar 3. Hasil waktu query pada database dms 3



Gambar 4. Hasil waktu query pada database dms 4

BAB III HASIL DAN PEMBAHASAN

3.1 Tabel Hasil

Data	Waktu Sebelum Tuning (ms)					Waktu Sesudah Tuning (ms)				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Advisor = 100, Student = 100, Section = 200, Takes = 200	0.3 ms	0.3 ms	0.5 ms	1.4 ms	2.4 ms	0.2 ms	0.3 ms	0.5 ms	1.3 ms	1.1 ms
Advisor = 200, Student = 200, Section = 400, Takes = 400	0.6 ms	0.6 ms	0.6 ms	5.6 ms	4.8 ms	0.6 ms	0.6 ms	0.6 ms	2.8 ms	4.4 ms
Advisor = 500, Student = 500, Section = 1000, Takes = 1000	1.0 ms	1.0 ms	0.3 ms	11.2 ms	6.4 ms	0.5 ms	0.6 ms	0.8 ms	11.0 ms	6.3 ms
Advisor = 700, Student = 700, Section = 2000, Takes = 20	1.2 ms	1.2 ms	0.11 ms	4.4 ms	5.5 ms	1.0 ms	0.7 ms	0.4 ms	1.4 ms	1.9 ms

3.3 Deskripsi

Database Tuning adalah sejumlah aktifitas yang dilakukan untuk memperbaiki atau meningkatkan kinerja atau performance sebuah database. Aktifitas tuning ini meliputi banyak aspek dari software hingga hardware, antara lain I/O Tuning, DBMS Tuning, Query Tuning, dan Database Maintenance.

Dari hasil yang didapat, telah dilakukan tuning dengan sistem indexing pada database dan mendapatkan waktu eksekusi query yang lebih singkat. Hal ini sesuai dengan fungsi performance tuning dengan metode indexing dimana berperan untuk meningkatkan performa DBMS yang digunakan.

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