15V

Lektion 5

Fredag den 9. september 2016

Litteratur: [Ramakrishnan] kapitel 4, siderne 100-107 (det er nok delvis repetition, fokuser på operationerne SELECT, PROJECT og JOIN)
[Ramakrishnan] kapitel 12 side 393-417

Emner:

Gennemgang af opgave 2.2 og 4.3 (forventet lavet hjemme)

Lille kort eksempel med index, count og exists

Systemtabeller
- Hvad kan vi bruge dem til
- Hvordan bruger man dem

Optimering – generel teori
- Relationel algebra
- Hvad kan optimizer vælge mellem
- Reduction factor og estimering
- Query plan og valg mellem disse
- Plan cache

Optimering i SQL-server
- Execution planer
- Hash Match Joins

Hvordan kan vi bestemme hvad optimizer skal vælge
- Table hints
- Join hints
- Query hints

Kort repetition om triggere

Opgaver:

Opgave 5.1,5.2
Arbejde med afleveringsopgaven (udleveres)

Læsning til næste gang:

[Ramakrishnan] kapitel 20 (til og med 20.10) side 649-671

Bemærkninger:

Exercise 5.1

This exercise is about how the optimizer handles joins.

In the last part of the OptimizerE16-script you can find T-SQL for creating and inserting data into three tables, you should use for the following exercise

Start by creating a new database (70 MB). (don't use tempdb)

Run the script, which creates the three tables and inserts the data.

(You have now created three tables - big with 40000 records, bigtoo with 10000 records and manytomany with 20000 records).

Set statistics time on

In all the following exercise note the runtime (elapsed time).

Exercise 5.1.1

Make a query to join the three tables on the id's. The joins should be between big and manytomany and the result of that joined with bigtoo.

Look in the estimated execution plan to see which join-order and which join-method the optimizer will use. Run the query and note the runtime.

Try to force the optimizer to use the two other join-methods. Again note the runtime.

Try to change the join-order for the best join-method. Again note the runtime. Was it a better way?

Exercise 5.1.2

Make a clustered index on id in big.

Make a clustered index on bigid in manytomany.

What does the optimizer now about the original query from exercise 1.

Can you make it do something better? (Think!!!)

Exercise 5.2

This exercise will use the eksempeldb (can be found at fronter Lektion 1).

Sometimes I hear new database-developers suggest, that instead of making all those joins in the queries we could start be making a gigantic view (with a lot of joins) and the in the query just select what we want from the view.

Exercise 5.2.1

Make a view, which shows cpr, name, home-postaldistrict, companyname, company-postaldistrict for all persons, who works in a company.

Make a select, which shows everything from the view. Look at the execution plan.

Make a select (based on the view), which just shows name and companyname. Look at the execution plan

What did this exercise show you.

Exercise 5.2.2

In this exercise we will see how index are used, when the query contains LIKE (and _ or %).

Make a clustered index on name in the table person (you need to change the script to be able to make that clustered index)

Try different queries on the form

Select * from person where name like '……'

How is index used in this kind of queries.

Afleveringsopgave

This exercise is about denormalization.

On fronter you can find a script for a database about the results in the Danish Superliga.
The script includes all the teams and all the results so far for the season 2016-2017.

The hand-in must be done at the latest **Wednesday the 21'th of September 23:59.** It is not possible to hand in after the deadline**.** The handin should be done on fronter. The handin must be in one and only one document. The type of the document can be doc, docx or pdf – no other document-types are accepted. Zip-files of any kind are not accepted.

Exercise A

Find a way to make it possible to see the current scoretable. You must use a denormalization-technic. You can assume, that the results are inserted one by one. The actual scoretable today (7'th of September) is shown below.

Brøndby IF	7	23	6	15
FC København	7	17	4	15
AaB	7	11	7	15
Randers FC	7	8	5	14
FC Midtjylland	7	15	10	10
Horsens	7	10	9	10
Lyngby	7	8	8	8
Viborg	7	8	9	8
AGF	7	8	15	8
OB	7	9	9	7
FC Nordsjælland	7	8	14	7
Esbjerg fB	7	8	17	5
SønderjyskE	7	6	12	4
Silkeborg	7	4	18	2

Exercise B

In Exercise A your trigger can handle inserts of results. Can you make it work also for deletes and updates. Again assume that deletes and updates only affects one record

Exercise C

As you can see, the matches-table has a matchdate-field. It makes it possible to show the scoretable as it was on a certain date. Make a stored procedure (with a date-parameter) to show the scoretable on a certain date.

Exercise D

Show a list of dates (all the dates, where we have had matches) and for each date, the team, which leads the Superliga.

A possible print from the program could look like this:

```
On date Jul 15 2016 12:00AM the leader is FC Nordsjælland
On date Jul 16 2016 12:00AM the leader is FC Nordsjælland
On date Jul 17 2016 12:00AM the leader is Brøndby IF
On date Jul 18 2016 12:00AM the leader is Brøndby IF
On date Jul 22 2016 12:00AM the leader is AGF
On date Jul 23 2016 12:00AM the leader is FC København
On date Jul 24 2016 12:00AM the leader is FC København
On date Jul 29 2016 12:00AM the leader is FC København
On date Jul 30 2016 12:00AM the leader is FC København
On date Jul 31 2016 12:00AM the leader is FC København
On date Aug  1 2016 12:00AM the leader is FC København
On date Aug  5 2016 12:00AM the leader is FC København
On date Aug  6 2016 12:00AM the leader is FC København
On date Aug  7 2016 12:00AM the leader is FC København
On date Aug  8 2016 12:00AM the leader is FC København
On date Aug 12 2016 12:00AM the leader is FC København
On date Aug 13 2016 12:00AM the leader is FC København
On date Aug 14 2016 12:00AM the leader is FC København
On date Aug 15 2016 12:00AM the leader is FC København
On date Aug 19 2016 12:00AM the leader is FC København
On date Aug 20 2016 12:00AM the leader is FC København
On date Aug 21 2016 12:00AM the leader is Brøndby IF
On date Aug 22 2016 12:00AM the leader is Brøndby IF
On date Aug 26 2016 12:00AM the leader is Brøndby IF
On date Aug 28 2016 12:00AM the leader is Brøndby IF
```

Rules for the superliga:

The teams get 3 points for winning, 1 point for a draw and 0 point for loosing.

In the scoretable points count the most. If two teams have the same number of points, the difference in goals counts (own goals – goals against you). If points and difference in goals are the same the number of own goals counts.