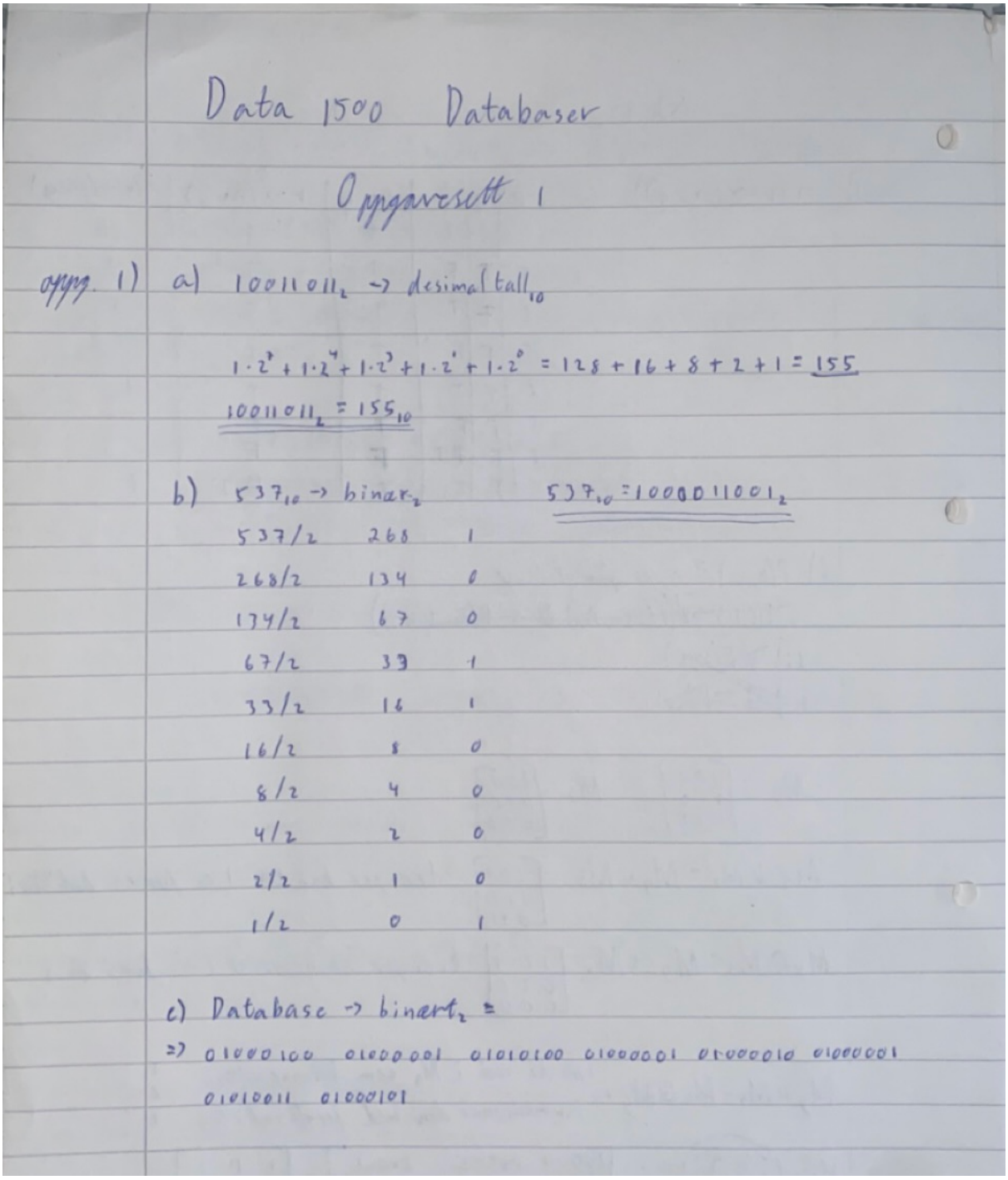
Oppgavesett 1

Oppgave 1)



Data 1500 Databaser

Oppgavesett 1

oppg. 1) a) 10011011_2 → desimal tall$_{10}$

$1 \cdot 2^7 + 1 \cdot 2^4 + 1 \cdot 2^3 + 1 \cdot 2^1 + 1 \cdot 2^0 = 128 + 16 + 8 + 2 + 1 = 155$

$10011011_2 = 155_{10}$

b) 537_{10} → binær$_2$ $537_{10} = 1000011001_2$

537/2	268	1
268/2	134	0
134/2	67	0
67/2	33	1
33/2	16	1
16/2	8	0
8/2	4	0
4/2	2	0
2/2	1	0
1/2	0	1

c) Database → binært$_2$ =

=> 01000100 01000001 01010100 01000001 01000010 01000001

01010011 01000101

Oppgave 2)

«SQL Select Exercise»

1) Insert the missing statement to get all the columns from

   Select * from Customers;

2) Write a statement that will select the `City` column from the `Customers` table.

   Select city From Customers;

3) Select all the *different* values from the `Country` column in the `Customers` table.

   Select Distinct Country From Customers;

«SQL Where Exercise»

1) Select all records where the `City` column has the value "Berlin".

   Select * from Customers

   Where City = 'Berlin';

2) Use the NOT keyword to select all records where City is NOT "Berlin".

   Select * From Customers

   Where Not City = 'Berlin';

3) Select all records where the CustomerID column has the value 32.

   Select*From Customers

   Where CustomerID = 32;

4) Select all records where the City column has the value 'Berlin' and the Postalcode column has the value 12209

   Select * From Customers

   Where City = 'Berlin'

   And PostalCode = 12209;

5) Select all records where the City column has the 'Berlin' or 'London'.

   Select*from Customers

   Where City = 'Berlin'

   Or City = 'London';

«SQL Order By exercise»

1) Select all records from the Customers table, sort the result alphabetically by the column City.

   Select * From Customers

   Order by City;

2) Select all records from the Customers table, sort the result reversed alphabetically by the column city.

   Select * From Customers

   Order By City Desc;

3) Select all records from the Customers table, sort the result alphabetically, first by the column Country, then, by the column City.

   Select * From Customers

   Order by Country City;

«SQL Insert Exercise»

1) Insert a new record in the Customers table.

   Insert into Customers (

   CustomerName,

   Address,

   City,

   PostalCode,

   Country)

   Values(

   ‘Hekkan Burger’,

   ‘Gateveien 15’,

   ‘Sandnes’,

   ‘4306’,

   ‘Norway’);

«SQL Null Exercise»

1) Selet all records from the Customers where the PostalCOde column is empty.

```
Select * From Customers
Where PostalCode Is Null;
```

2) Select all records from the Customers where the PostalCode column is NOT empty

```
Select * From Customers
Where PostalCode Is Not Null;
```

«SQL Update Exercise»

1) Update the City column of all records in the Customers table

```
Update Customers
Set City = ‘Oslo’;
```

2) Set the value of the City column to ‘Oslo’, but only the ones where the Country column has the value “Norway”.

```
Update Customers
Set City = ‘Oslo’
Where Country = ‘Norway’;
```

3) Update the City value and the Country value.

```
Update Customers
Set City = ‘Oslo’,
Country = ‘Norway’
Where CustomerID = 32;
```

«SQL Delete Exercise»

1) Delete all the records from the Customers table where the Country value is ‘Norway’

```
Delete From Customers
Where Country = ‘Norway’;
```

2) Delete all the records from the Customers table.

   Delete From Customers;

«SQL Functions Exercise»

1) Use the MIN function to select the record with the smallest value of the Price column.

   Select Min(Price)

   From Products;

2) Use an SQL function to select the record with highest value of the Price column

   Select Max(Price)

   From Products;

3) Use the correct function to return the number of records that have the Price value set to 18.

   Select Count(*)

   From Products

   Where Price = 18;

4) Use an SQL function to calculate the average price of all products.

   Select AVG(Price)

   From Products;

5) Use an SQL function to calculate the sum of all the Price column values in the Products table

   Select Sum(Price)

   From Products;

«SQL Like Exercise»

1) Select all records where the value of the city column starts with the letter “a”.

   Select * From Customers

   Where City Like ‘a%’;

2) Select all records where the value of the City column ends with the letter “a”.

   Select * From Customers

   Where City Like ‘%a’;

3) Select all records where the value of the City column contains the letter “a”.

   Select * From Customers

   Where City Like ‘%a%’;

4) Select all records where the value of the City column starts with letter “a” and ends with the letter “b”.

   Select * From Customers

   Where City Like ‘a%b’;

5) Select all records where the value fo the City column does NOT start with the letter “a”.

   Select * From Customers

   Where City Not Like ‘a%’;

«SQL Wildcards Exercise»

1) Select all records where the second letter of the City is an “a”.

   Select * From Customers

   Where City Like ‘_a%;

2) Select all records where the first letter of the City is an “a” or a “c” or an “s”.

   Select * From Customers

   Where City Like ‘[acs]%’;

3) Select all records where the first letter of the City starts with anything from an “a” to an “f”.

   Select * From Customers

   Where City Like ‘[a-f]%’;

4) Select all records where the first letter of the City is NOT an “a” or a “c” or an “f”.

   Select * From Customers

   Where City Like ‘[!acf]%’;

Oppgave 3)

a) Hva er en Database?

Ifølge Wikipedia er «Database» en strukturert samling av relaterte data. SNL utdyper begrepet med at datasamlingen følger en bestemt strategi eller modell, en så kalt *databasemodell*. I tillegg brukes og vedlikeholdes dataene gjennom et programsystem, altså et *databasesystem*.

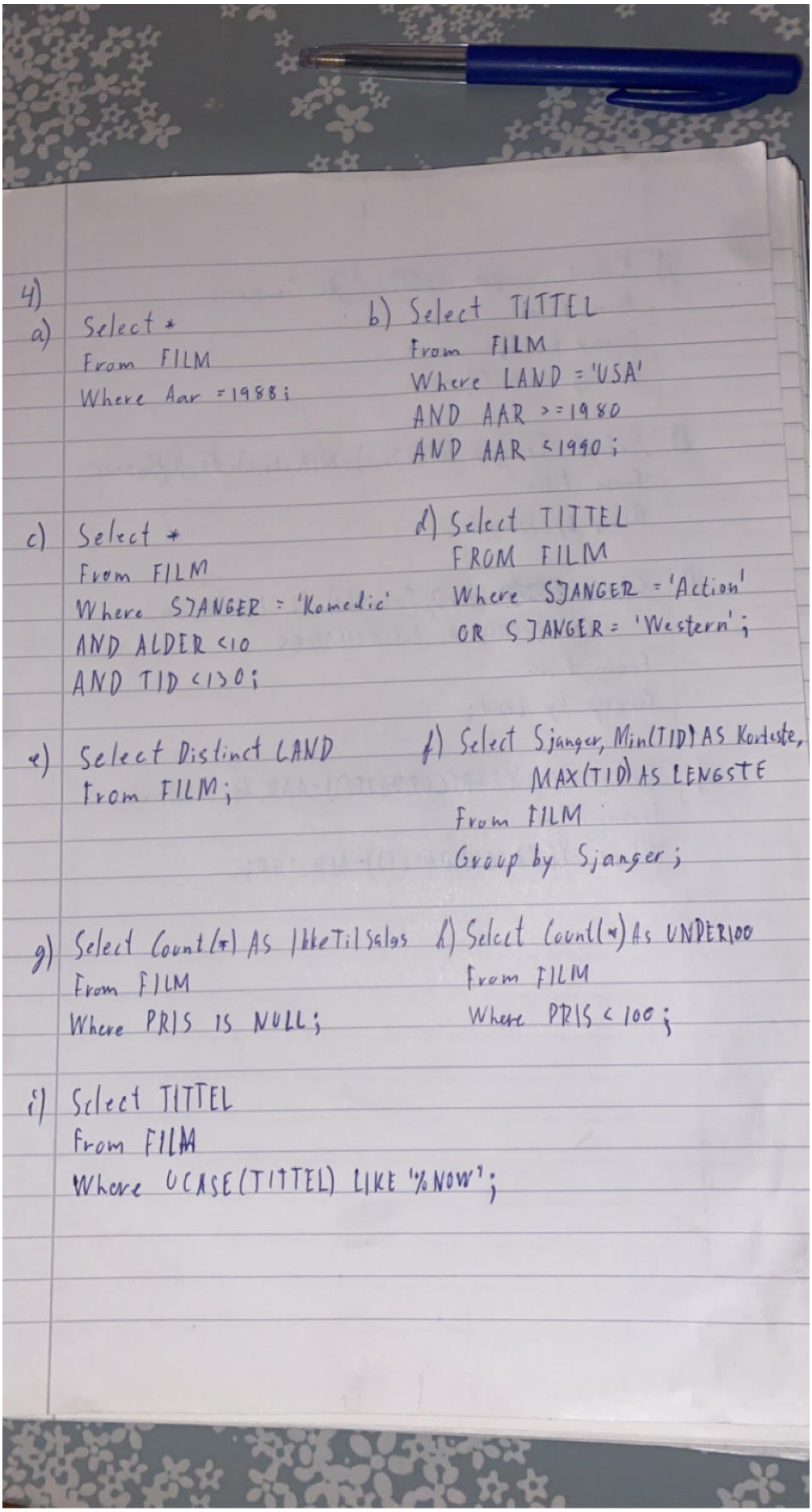
b) **Hva er en relasjonsdatabase?**

Ifølge Wikipedia er «Relasjonsdatabaser» den dominerende formen for databasesystem per dags dato. Databasen følger relasjonsmodellen og består av tabeller som er forbundet ved bruk av henvisninger eller nøkler mellom seg. SNL utdyper at verdiene i tabellen er identifiserbare og er navngitt. Det vil si at verdiene har fått attributtnavn eller attributtverdi, som gjør det lettere å finne frem.

Kilder:

- https://no.wikipedia.org/wiki/Database
- https://snl.no/database
- https://no.wikipedia.org/wiki/Relasjonsdatabase
- https://snl.no/relasjonsdatabase

Oppgave 4)



4)

a)
```
Select *
From FILM
Where Aar =1988;
```

b)
```
Select TITTEL
From FILM
Where LAND = 'USA'
AND AAR >=1980
AND AAR <1990;
```

c)
```
Select *
From FILM
Where SJANGER = 'Komedie'
AND ALDER <10
AND TID <130;
```

d)
```
Select TITTEL
FROM FILM
Where SJANGER = 'Action'
OR SJANGER = 'Western';
```

e)
```
Select Distinct LAND
From FILM;
```

f)
```
Select Sjanger, Min(TID) AS Korteste,
MAX(TID) AS LENGSTE
From FILM
Group by Sjanger;
```

g)
```
Select Count(*) AS IkkeTilSalgs
From FILM
Where PRIS IS NULL;
```

h)
```
Select Count(*) As UNDER100
From FILM
Where PRIS < 100;
```

i)
```
Select TITTEL
From FILM
Where UCASE(TITTEL) LIKE '%NOW';
```

j)
```
Select Sjanger, AVG(PRIS) As Snittpris
From Film
Group by Sjanger
Having Count(*) > 2;
```

k)
```
Select Sjanger, MAX(Pris) - MIN(Pris) As Differanse
From Film
Group by Sjanger;
```

l)
```
Select [redacted] LAND, Count(*) As totalFilmer,
    Count(PRIS) As AntallTILSALGS
From Film
Group by Land;
```

m)
```
Select FNr, YEAR(CURDATE()) - AAR As Antallaar
From Film
Where YEAR(CURDATE()) - AAR > 50;
```

Oppgavesett 2

Oppgave 1)

SQL Database Exercise

3) Write the correct SQL statement to create a new table called `Persons`.

```
CREATE TABLE Persons (
  PersonID int,
  LastName varchar(255),
  FirstName varchar(255),
  Address varchar(255),
  City varchar(255)
);
```

4) Write the correct SQL statement to delete a table called `Persons`.

```
Drop Table Persons;
```

5) Use the `TRUNCATE` statement to delete all data inside a table.

```
Truncate Table Persons;
```

6) Add a column of type `DATE` called `Birthday`.

```
Alter Table Persons
Add Birthday DATE;
```

7) Delete the column `Birthday` from the `Persons` table.

```
Alter Table Persons
Drop Column Birthday;
```

Oppgave 2 og 3)

```
MariaDB [s374922]> show tables;
+--------------------+
| Tables_in_s374922 |
+--------------------+
| DEPT               |
| EMP                |
| FILM               |
+--------------------+
3 rows in set (0.000 sec)

MariaDB [s374922]> select * from FILM;
+------+----------------------+------+-------------+-----------+-------+------+--------+
| FNR  | TITTEL               | AAR  | LAND        | SJANGER   | ALDER | TID  | PRIS   |
+------+----------------------+------+-------------+-----------+-------+------+--------+
|    1 | Casablanca           | 1942 | USA         | Drama     |    15 |  102 | 149.00 |
|    2 | Fort Apache          | 1948 | USA         | Western   |    15 |  127 |   NULL |
|    3 | Apocalypse Now       | 1979 | USA         | Action    |    18 |  155 | 123.00 |
|    4 | Streets of Fire      | 1984 | USA         | Action    |    15 |   93 |   NULL |
|    5 | High Noon            | 1952 | USA         | Western   |    15 |   85 | 123.00 |
|    6 | Cinema Paradiso      | 1988 | Italia      | Komedie   |    11 |  123 |   NULL |
|    7 | Asterix hos britene  | 1988 | Frankrike   | Tegnefilm |     7 |   78 | 149.00 |
|    8 | Veiviseren           | 1987 | Norge       | Action    |    15 |   96 |  87.00 |
|    9 | Salmer fra kjokkenet | 2002 | Norge       | Komedie   |     7 |   80 | 149.00 |
|   10 | Anastasia            | 1997 | USA         | Tegnefilm |     7 |   94 | 123.00 |
|   11 | La Grande bouffe     | 1973 | Frankrike   | Drama     |    15 |  129 | 187.00 |
|   12 | The Blues Brothers   | 1980 | USA         | Komedie   |    11 |  133 | 135.00 |
|   13 | Beatles Help         | 1965 | Storbritania| Musikk    |    11 |  144 |   NULL |
+------+----------------------+------+-------------+-----------+-------+------+--------+
13 rows in set (0.000 sec)
```

Oppgave 4)

a)

```
MariaDB [s374922]> Select * from FILM Where AAR = 1988;
+------+---------------------+------+-----------+-----------+-------+------+--------+
| FNR  | TITTEL              | AAR  | LAND      | SJANGER   | ALDER | TID  | PRIS   |
+------+---------------------+------+-----------+-----------+-------+------+--------+
|    6 | Cinema Paradiso     | 1988 | Italia    | Komedie   |    11 |  123 |   NULL |
|    7 | Asterix hos britene | 1988 | Frankrike | Tegnefilm |     7 |   78 | 149.00 |
+------+---------------------+------+-----------+-----------+-------+------+--------+
2 rows in set (0.000 sec)
```

b)

```
MariaDB [s374922]> Select TITTEL from FILM Where LAND = 'USA' AND AAR >=1980 AND AAR <1990;
+--------------------+
| TITTEL             |
+--------------------+
| Streets of Fire    |
| The Blues Brothers |
+--------------------+
2 rows in set (0.000 sec)
```

c)

```
MariaDB [s374922]> Select * from FILM Where SJANGER = 'Komedie' AND Alder < 10 AND TID < 130;
+------+----------------------+------+-------+---------+-------+------+--------+
| FNR  | TITTEL               | AAR  | LAND  | SJANGER | ALDER | TID  | PRIS   |
+------+----------------------+------+-------+---------+-------+------+--------+
|    9 | Salmer fra kjokkenet | 2002 | Norge | Komedie |     7 |   80 | 149.00 |
+------+----------------------+------+-------+---------+-------+------+--------+
1 row in set (0.000 sec)
```

d)

```
MariaDB [s374922]> Select TITTEL from FILM Where SJANGER = 'Action' OR SJANGER = 'Western';
+-----------------+
| TITTEL          |
+-----------------+
| Fort Apache     |
| Apocalypse Now  |
| Streets of Fire |
| High Noon       |
| Veiviseren      |
+-----------------+
5 rows in set (0.000 sec)
```

e)

```
MariaDB [s374922]> SELECT DISTINCT LAND FROM FILM;
+--------------+
| LAND         |
+--------------+
| USA          |
| Italia       |
| Frankrike    |
| Norge        |
| Storbritania |
+--------------+
5 rows in set (0.000 sec)
```

f)

```
MariaDB [s374922]> SELECT Sjanger, MIN(TID) AS Korteste, MAX(TID) AS Lengste From FILM GROUP BY Sjanger;
+-----------+----------+---------+
| Sjanger   | Korteste | Lengste |
+-----------+----------+---------+
| Action    |       93 |     155 |
| Drama     |      102 |     129 |
| Komedie   |       80 |     133 |
| Musikk    |      144 |     144 |
| Tegnefilm |       78 |      94 |
| Western   |       85 |     127 |
+-----------+----------+---------+
6 rows in set (0.000 sec)
```

g)

```
MariaDB [s374922]> Select Count(*) AS IkkeTilSalgs from FILM Where PRIS IS NULL OR PRIS = 0;
+--------------+
| IkkeTilSalgs |
+--------------+
|            4 |
+--------------+
1 row in set (0.000 sec)
```

h)

```
MariaDB [s374922]> Select Count(*) As Under100 from FILM Where PRIS < 100;
+-----------+
| Under100 |
+-----------+
|         5 |
+-----------+
1 row in set (0.000 sec)
```

i)

```
MariaDB [s374922]> Select TITTEL from FILM Where UCASE(TITTEL) LIKE '%NOW';
+----------------+
| TITTEL         |
+----------------+
| Apocalypse Now |
+----------------+
1 row in set (0.000 sec)
```

j)

```
MariaDB [s374922]> SELECT SJANGER, AVG(PRIS) AS Snittpris From FILM GROUP BY SJANGER HAVING count(*)>2;
+---------+------------+
| SJANGER | Snittpris  |
+---------+------------+
| Action  | 105.000000 |
| Komedie | 142.000000 |
+---------+------------+
2 rows in set (0.001 sec)
```

k)

```
MariaDB [s374922]> select SJANGER, MAX(PRIS)-MIN(PRIS) AS DifferanseMAXMIN from FILM Group by SJANGER;
+-----------+------------------+
| SJANGER   | DifferanseMAXMIN |
+-----------+------------------+
| Action    |            36.00 |
| Drama     |            38.00 |
| Komedie   |            14.00 |
| Musikk    |             NULL |
| Tegnefilm |            26.00 |
| Western   |             0.00 |
+-----------+------------------+
6 rows in set (0.000 sec)
```

l)

```
MariaDB [s374922]> Select LAND, count(*) as Totalfilmer, count(PRIS) as AntallTilSalgs from FILM Group by LAND;
+--------------+-------------+----------------+
| LAND         | Totalfilmer | AntallTilSalgs |
+--------------+-------------+----------------+
| Frankrike    |           2 |              2 |
| Italia       |           1 |              0 |
| Norge        |           2 |              2 |
| Storbritania |           1 |              0 |
| USA          |           7 |              5 |
+--------------+-------------+----------------+
5 rows in set (0.001 sec)
```

m)

```
MariaDB [s374922]> SELECT FNR, YEAR(CURDATE())-AAR AS AntallAar From FILM Where YEAR(CURDATE())-AAR > 50;
+------+-----------+
| FNR  | AntallAar |
+------+-----------+
|    1 |        81 |
|    2 |        75 |
|    5 |        71 |
|   13 |        58 |
+------+-----------+
4 rows in set (0.000 sec)
```

Oppgavesett 3

Oppg.1)

1) List opp etternavn, avdeling og lønn til alle ansatte i EMP tabellen med lønn mellom 1000 og 2000.

```
MariaDB [s374922]> Select ENAME, DEPTNO, SAL from EMP Where SAL between 1000 and 2000;
+--------+--------+------+
| ENAME  | DEPTNO | SAL  |
+--------+--------+------+
| ALLEN  |     30 | 1600 |
| WARD   |     30 | 1250 |
| MARTIN |     30 | 1250 |
| TURNER |     30 | 1500 |
| ADAMS  |     20 | 1100 |
| MILLER |     10 | 1300 |
+--------+--------+------+
6 rows in set (0,000 sec)
```

2) List de ulike jobbtypene som finnes.

```
MariaDB [s374922]> select distinct job from EMP;
+-----------+
| job       |
+-----------+
| CLERK     |
| SALESMAN  |
| MANAGER   |
| ANALYST   |
| PRESIDENT |
+-----------+
5 rows in set (0,000 sec)
```

3) List ansattnr, navn, jobb, lønn og avdelingsnr for ansatte i avdeling 10 og 30.

```
MariaDB [s374922]> select EMPNO, ENAME, JOB, SAL, DEPTNO from EMP Where DEPTNO between 10 and 30;
+-------+--------+-----------+------+--------+
| EMPNO | ENAME  | JOB       | SAL  | DEPTNO |
+-------+--------+-----------+------+--------+
|  7369 | SMITH  | CLERK     |  800 |     20 |
|  7499 | ALLEN  | SALESMAN  | 1600 |     30 |
|  7521 | WARD   | SALESMAN  | 1250 |     30 |
|  7566 | JONES  | MANAGER   | 2975 |     20 |
|  7654 | MARTIN | SALESMAN  | 1250 |     30 |
|  7698 | BLAKE  | MANAGER   | 2850 |     30 |
|  7782 | CLARK  | MANAGER   | 2450 |     10 |
|  7788 | SCOTT  | ANALYST   | 3000 |     20 |
|  7839 | KING   | PRESIDENT | 5000 |     10 |
|  7844 | TURNER | SALESMAN  | 1500 |     30 |
|  7876 | ADAMS  | CLERK     | 1100 |     20 |
|  7900 | JAMES  | CLERK     |  950 |     30 |
|  7902 | FORD   | ANALYST   | 3000 |     20 |
|  7934 | MILLER | CLERK     | 1300 |     10 |
+-------+--------+-----------+------+--------+
14 rows in set (0,001 sec)
```

4) Vis ansatte som ble rekruttert i 1982.

```
MariaDB [s374922]> Select * from EMP where HIREDATE like '1982%';
+-------+--------+-------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB   | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+-------+------+------------+------+------+--------+
|  7934 | MILLER | CLERK | 7782 | 1982-01-23 | 1300 | NULL |     10 |
+-------+--------+-------+------+------------+------+------+--------+
1 row in set (0,000 sec)
```

5) List ansatte som med navn som inneholder TH eller AR.

```
MariaDB [s374922]> Select * from EMP Where ENAME like '%TH%' UNION Select * from EMP Where ENAME like '%AR%';
+-------+--------+----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB      | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+----------+------+------------+------+------+--------+
|  7369 | SMITH  | CLERK    | 7902 | 1980-12-17 |  800 | NULL |     20 |
|  7521 | WARD   | SALESMAN | 7698 | 1981-02-22 | 1250 |  500 |     30 |
|  7654 | MARTIN | SALESMAN | 7698 | 1981-09-28 | 1250 | 1400 |     30 |
|  7782 | CLARK  | MANAGER  | 7839 | 1981-06-09 | 2450 | NULL |     10 |
+-------+--------+----------+------+------------+------+------+--------+
4 rows in set (0,000 sec)
```

6) List ansattnr og navn sortert på navn.

```
MariaDB [s374922]> select EMPNO, ENAME from EMP Order by ENAME;
+-------+--------+
| EMPNO | ENAME  |
+-------+--------+
|  7876 | ADAMS  |
|  7499 | ALLEN  |
|  7698 | BLAKE  |
|  7782 | CLARK  |
|  7902 | FORD   |
|  7900 | JAMES  |
|  7566 | JONES  |
|  7839 | KING   |
|  7654 | MARTIN |
|  7934 | MILLER |
|  7788 | SCOTT  |
|  7369 | SMITH  |
|  7844 | TURNER |
|  7521 | WARD   |
+-------+--------+
14 rows in set (0,000 sec)
```

7) Finn navn, jobb, lønn og kommisjon til alle ansatte som ikke har noen sjef.

```
MariaDB [s374922]> Select ENAME, JOB, SAL, COMM from EMP Where MGR Is NULL;
+-------+-----------+------+------+
| ENAME | JOB       | SAL  | COMM |
+-------+-----------+------+------+
| KING  | PRESIDENT | 5000 | NULL |
+-------+-----------+------+------+
1 row in set (0,001 sec)
```

8) List alle selgere i synkende rekkefølge på kommisjon delt på lønn.

```
MariaDB [s374922]> Select * From EMP Where JOB = 'SALESMAN' Order by (COMM/SAL) DESC;
+-------+--------+----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB      | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+----------+------+------------+------+------+--------+
|  7654 | MARTIN | SALESMAN | 7698 | 1981-09-28 | 1250 | 1400 |     30 |
|  7521 | WARD   | SALESMAN | 7698 | 1981-02-22 | 1250 |  500 |     30 |
|  7499 | ALLEN  | SALESMAN | 7698 | 1981-02-18 | 1600 |  300 |     30 |
|  7844 | TURNER | SALESMAN | 7698 | 1981-09-08 | 1500 |    0 |     30 |
+-------+--------+----------+------+------------+------+------+--------+
4 rows in set (0,000 sec)
```

9) Finn årlig kompensasjon til selgerne basert på månedlig lønn og månedlig kommisjon

```
[MariaDB [s374922]> Select EMPNO, ENAME, JOB, SAL, COMM, ((SAL*12)+(COMM*12)) as "YEARLYCOMPENSATION"
[    -> FROM EMP
[    -> WHERE JOB = 'SALESMAN';
+-------+--------+----------+------+------+--------------------+
| EMPNO | ENAME  | JOB      | SAL  | COMM | YEARLYCOMPENSATION |
+-------+--------+----------+------+------+--------------------+
|  7499 | ALLEN  | SALESMAN | 1600 |  300 |              22800 |
|  7521 | WARD   | SALESMAN | 1250 |  500 |              21000 |
|  7654 | MARTIN | SALESMAN | 1250 | 1400 |              31800 |
|  7844 | TURNER | SALESMAN | 1500 |    0 |              18000 |
+-------+--------+----------+------+------+--------------------+
4 rows in set (0.002 sec)
```

10) Finn alle selgere i avdeling 30 med lønn større eller lik 1500.

```
MariaDB [s374922]> Select * from EMP where DEPTNO=30 AND SAL >=1500;
+-------+--------+----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB      | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+----------+------+------------+------+------+--------+
|  7499 | ALLEN  | SALESMAN | 7698 | 1981-02-18 | 1600 |  300 |     30 |
|  7698 | BLAKE  | MANAGER  | 7893 | 1981-05-01 | 2850 | NULL |     30 |
|  7844 | TURNER | SALESMAN | 7698 | 1981-09-08 | 1500 |    0 |     30 |
+-------+--------+----------+------+------------+------+------+--------+
3 rows in set (0,000 sec)
```

11) Finn antall Manager i EMP tabellen

```
MariaDB [s374922]> Select Count(Distinct MGR) From EMP;
+----------------------+
| Count(Distinct MGR)  |
+----------------------+
|                    7 |
+----------------------+
1 row in set (0,000 sec)
```

12) Finn gjennomsnittlig årlig lønn + kommisjon for selgerne

```
MariaDB [s374922]> Select AVG(SAL+COMM)From EMP Where JOB = 'SALESMAN';
+----------------+
| AVG(SAL+COMM)  |
+----------------+
|     1950.0000  |
+----------------+
1 row in set (0,000 sec)
```

13) Finn differansen mellom høyeste og laveste lønn.

```
MariaDB [s374922]> select MAX(SAL)-MIN(SAL) from EMP;
+--------------------+
| MAX(SAL)-MIN(SAL)  |
+--------------------+
|               4200 |
+--------------------+
1 row in set (0,000 sec)
```

14) Finn det lengste avdelingsnavnet

```
MariaDB [s374922]> Select Dname from DEPT Order by length(DNAME) DESC;
+------------+
| Dname      |
+------------+
| ACCOUNTING |
| OPERATIONS |
| RESEARCH   |
| SALES      |
+------------+
4 rows in set (0,000 sec)
```

Det lengste avdelingsnavnet er både accounting og operations,

```
MariaDB [s374922]> Select DNAME from DEPT Order by Length(DNAME) DESC Limit 2;
+------------+
| DNAME      |
+------------+
| ACCOUNTING |
| OPERATIONS |
+------------+
2 rows in set (0,000 sec)
```

15) Finn antall ansatte i avdeling 30 som har fått kommisjon

```
MariaDB [s374922]> Select Count(Distinct EMPNO) From EMP Where DEPTNO = 30 AND COMM >0;
+-----------------------+
| Count(Distinct EMPNO) |
+-----------------------+
|                     3 |
+-----------------------+
1 row in set (0,000 sec)
```

16) Finn navn og lønn til alle ansatte i Chicago

```
MariaDB [s374922]> Select EMP.ENAME, EMP.SAL, DEPT.LOC From EMP Inner join DEPT on EMP.DEPTNO=DEPT.DEPTNO Where LOC = 'CHICAGO';
+--------+------+---------+
| ENAME  | SAL  | LOC     |
+--------+------+---------+
| ALLEN  | 1600 | CHICAGO |
| WARD   | 1250 | CHICAGO |
| MARTIN | 1250 | CHICAGO |
| BLAKE  | 2850 | CHICAGO |
| TURNER | 1500 | CHICAGO |
| JAMES  |  950 | CHICAGO |
+--------+------+---------+
6 rows in set (0,000 sec)
```

17) List avdelingsnr, avdelingsnavn, jobb og etternavn med avdelingsnr i stigende rekkefølge.

```
MariaDB [s374922]> Select EMP.DEPTNO,DEPT.LOC,EMP.JOB,EMP.ENAME From EMP Inner join DEPT on EMP.DEPTNO=DEPT.DEPTNO Order by EMP.DEPTNO ASC;
+--------+----------+-----------+--------+
| DEPTNO | LOC      | JOB       | ENAME  |
+--------+----------+-----------+--------+
|     10 | NEW YORK | MANAGER   | CLARK  |
|     10 | NEW YORK | PRESIDENT | KING   |
|     10 | NEW YORK | CLERK     | MILLER |
|     20 | DALLAS   | CLERK     | SMITH  |
|     20 | DALLAS   | MANAGER   | JONES  |
|     20 | DALLAS   | ANALYST   | SCOTT  |
|     20 | DALLAS   | CLERK     | ADAMS  |
|     20 | DALLAS   | ANALYST   | FORD   |
|     30 | CHICAGO  | SALESMAN  | ALLEN  |
|     30 | CHICAGO  | SALESMAN  | WARD   |
|     30 | CHICAGO  | SALESMAN  | MARTIN |
|     30 | CHICAGO  | MANAGER   | BLAKE  |
|     30 | CHICAGO  | SALESMAN  | TURNER |
|     30 | CHICAGO  | CLERK     | JAMES  |
+--------+----------+-----------+--------+
14 rows in set (0,000 sec)
```

18) List alle avdelinger som ikke har noen ansatte

```
MariaDB [s374922]> Select * from DEPT Where DEPTNO Not In (select DEPTNO from EMP);
+--------+------------+--------+
| DEPTNO | DNAME      | LOC    |
+--------+------------+--------+
|     40 | OPERATIONS | BOSTON |
+--------+------------+--------+
1 row in set (0,000 sec)
```

19) List alle avdelinger som har ansatte

```
MariaDB [s374922]> Select * from DEPT where DEPTNO In(select DEPTNO from EMP);
+--------+------------+----------+
| DEPTNO | DNAME      | LOC      |
+--------+------------+----------+
|     10 | ACCOUNTING | NEW YORK |
|     20 | RESEARCH   | DALLAS   |
|     30 | SALES      | CHICAGO  |
+--------+------------+----------+
3 rows in set (0,000 sec)
```

20) Finn alle ansatte som tjener mer enn JONES.

```
MariaDB [s374922]> Select * from EMP Where SAL > (Select SAL From EMP Where ENAME = 'JONES');
+-------+-------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+-------+-----------+------+------------+------+------+--------+
|  7788 | SCOTT | ANALYST   | 7566 | 1981-11-09 | 3000 | NULL |     20 |
|  7839 | KING  | PRESIDENT | NULL | 1981-11-17 | 5000 | NULL |     10 |
|  7902 | FORD  | ANALYST   | 7566 | 1981-12-03 | 3000 | NULL |     20 |
+-------+-------+-----------+------+------------+------+------+--------+
3 rows in set (0,000 sec)
```

```
MariaDB [s374922]> Select E1.ENAME, E1.SAL, E2.ENAME, E2.SAL From EMP AS E1, EMP AS E2 Where E2.ENAME='JONES' AND E1.SAL>E2.SAL;
+-------+------+-------+------+
| ENAME | SAL  | ENAME | SAL  |
+-------+------+-------+------+
| SCOTT | 3000 | JONES | 2975 |
| KING  | 5000 | JONES | 2975 |
| FORD  | 3000 | JONES | 2975 |
+-------+------+-------+------+
3 rows in set (0.000 sec)
```

21) List opp ansatte som tjener mer enn sjefen sin.

```
MariaDB [s374922]> Select * From EMP e,(select * from EMP Where EMPNO In(Select MGR from EMP))a Where e.SAL >a.SAL AND e.MGR = a.EMPNO;
+-------+-------+---------+------+------------+------+------+--------+-------+-------+---------+------+------------+------+------+--------+
| EMPNO | ENAME | JOB     | MGR  | HIREDATE   | SAL  | COMM | DEPTNO | EMPNO | ENAME | JOB     | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+-------+---------+------+------------+------+------+--------+-------+-------+---------+------+------------+------+------+--------+
|  7788 | SCOTT | ANALYST | 7566 | 1981-11-09 | 3000 | NULL |     20 |  7566 | JONES | MANAGER | 7839 | 1981-04-02 | 2975 | NULL |     20 |
|  7902 | FORD  | ANALYST | 7566 | 1981-12-03 | 3000 | NULL |     20 |  7566 | JONES | MANAGER | 7839 | 1981-04-02 | 2975 | NULL |     20 |
+-------+-------+---------+------+------------+------+------+--------+-------+-------+---------+------+------------+------+------+--------+
2 rows in set (0,001 sec)
```

```
MariaDB [s374922]> Select E1.ENAME, E1.SAL, E2.ENAME,E2.SAL From EMP AS E1, EMP AS E2 Where E1.MGR=E2.EMPNO AND E1.SAL>E2.SAL;
+-------+------+-------+------+
| ENAME | SAL  | ENAME | SAL  |
+-------+------+-------+------+
| SCOTT | 3000 | JONES | 2975 |
| FORD  | 3000 | JONES | 2975 |
+-------+------+-------+------+
2 rows in set (0.001 sec)
```

22) List opp navn og jobb for ansatte som har samme jobb som JONES.

```
MariaDB [s374922]> Select ENAME, JOB From EMP Where JOB = (Select JOb from EMP where ENAME = 'JONES');
+-------+---------+
| ENAME | JOB     |
+-------+---------+
| JONES | MANAGER |
| BLAKE | MANAGER |
| CLARK | MANAGER |
+-------+---------+
3 rows in set (0,000 sec)
```

23) Finn alle ansatt i avdeling 10 som har samme jobb som noen i avdeling 30.

```
MariaDB [s374922]> Select * From EMP WHERE JOB IN(SELECT JOB FROM EMP e WHERE EMP.EMPNO <> e.EMPNO AND EMP.DEPTNO <> e.DEPTNO AND EMP.DEPTNO <> 20);
+-------+-------+---------+------+------------+------+------+--------+
| EMPNO | ENAME | JOB     | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+-------+---------+------+------------+------+------+--------+
|  7900 | JAMES | CLERK   | 7698 | 1981-12-03 |  950 | NULL |     30 |
|  7934 | MILLER| CLERK   | 7782 | 1982-01-23 | 1300 | NULL |     10 |
|  7698 | BLAKE | MANAGER | 7893 | 1981-05-01 | 2850 | NULL |     30 |
|  7782 | CLARK | MANAGER | 7839 | 1981-06-09 | 2450 | NULL |     10 |
+-------+-------+---------+------+------------+------+------+--------+
4 rows in set (0,000 sec)
```

24) List navn og jobb til ansatte som har samme jobb og lik lønn som FORD.

```
MariaDB [s374922]> Select ENAME, JOB From EMP Where JOB = (Select JOB from EMP where ENAME='FORD') and SAL = (Select SAL From EMP where ENAME='FORD');

+-------+---------+
| ENAME | JOB     |
+-------+---------+
| SCOTT | ANALYST |
| FORD  | ANALYST |
+-------+---------+
2 rows in set (0,000 sec)
```

25) List navn, jobb, avdeling og lønn for ansatte som har samme jobb som JONES og større eller lik lønn som FORD

```
MariaDB [s374922]> select * from EMP;
+-------+--------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+--------+-----------+------+------------+------+------+--------+
|  7369 | SMITH  | CLERK     | 7902 | 1980-12-17 |  800 | NULL |     20 |
|  7499 | ALLEN  | SALESMAN  | 7698 | 1981-02-18 | 1600 |  300 |     30 |
|  7521 | WARD   | SALESMAN  | 7698 | 1981-02-22 | 1250 |  500 |     30 |
|  7566 | JONES  | MANAGER   | 7839 | 1981-04-02 | 2975 | NULL |     20 |
|  7654 | MARTIN | SALESMAN  | 7698 | 1981-09-28 | 1250 | 1400 |     30 |
|  7698 | BLAKE  | MANAGER   | 7893 | 1981-05-01 | 2850 | NULL |     30 |
|  7782 | CLARK  | MANAGER   | 7839 | 1981-06-09 | 2450 | NULL |     10 |
|  7788 | SCOTT  | ANALYST   | 7566 | 1981-11-09 | 3000 | NULL |     20 |
|  7839 | KING   | PRESIDENT | NULL | 1981-11-17 | 5000 | NULL |     10 |
|  7844 | TURNER | SALESMAN  | 7698 | 1981-09-08 | 1500 |    0 |     30 |
|  7876 | ADAMS  | CLERK     | 7788 | 1981-09-23 | 1100 | NULL |     20 |
|  7900 | JAMES  | CLERK     | 7698 | 1981-12-03 |  950 | NULL |     30 |
|  7902 | FORD   | ANALYST   | 7566 | 1981-12-03 | 3000 | NULL |     20 |
|  7934 | MILLER | CLERK     | 7782 | 1982-01-23 | 1300 | NULL |     10 |
+-------+--------+-----------+------+------------+------+------+--------+
14 rows in set (0,000 sec)

MariaDB [s374922]> Select ENAME, JOB, DEPTNO, SAL From EMP Where JOB = (Select JOB from EMP where ENAME='JONES') and SAL >= (Select SAL From EMP where ENAME='F
Empty set (0,000 sec)
```

Select ENAME, JOB, DEPTNO, SAL From EMP

Where JOB = (Select JOB from EMP where ENAME=’JONES’)

AND SAL >= (Select SAL from EMP where ENAME=’Ford’);

Resultatet blir empty set, fordi det er ingen som tjener like mye eller mer enn Ford med stillingen Manager.

26) Finn alle ansatte i avdeling 10 som har samme jobb som noen i SALES avdelingen.

```
MariaDB [s374922]> Select E1.ENAME, E1.JOB, E1.DEPTNO, E2.ENAME, E2.JOB, E2.DEPTNO
    -> from (EMP AS E1 INNER JOIN EMP AS E2 ON E1.JOB = E2.JOB)
    -> Where E1.DEPTNO=10 AND E2.DEPTNO=30
    -> ;
+--------+---------+--------+-------+---------+--------+
| ENAME  | JOB     | DEPTNO | ENAME | JOB     | DEPTNO |
+--------+---------+--------+-------+---------+--------+
| CLARK  | MANAGER |     10 | BLAKE | MANAGER |     30 |
| MILLER | CLERK   |     10 | JAMES | CLERK   |     30 |
+--------+---------+--------+-------+---------+--------+
2 rows in set (0.000 sec)
```

27) Finn ansatte i Chicago som har samme jobb som ALLEN, sorter navnene i stigende rekkefølge.

```
MariaDB [s374922]> Select ENAME, JOB, DEPTNO From EMP Where JOB = (Select JOB from EMP where ENAME='ALLEN') AND DEPTNO = 30
    -> Order by ENAME ASC;
+--------+----------+--------+
| ENAME  | JOB      | DEPTNO |
+--------+----------+--------+
| ALLEN  | SALESMAN |     30 |
| MARTIN | SALESMAN |     30 |
| TURNER | SALESMAN |     30 |
| WARD   | SALESMAN |     30 |
+--------+----------+--------+
4 rows in set (0.001 sec)
```

28) Finn alle ansatte som tjener mer enn gjennomsnittet for ansatte i sin avdeling.

```
MariaDB [s374922]> select E1.* From EMP as E1 where sal>(select avg(SAL) from EMP
    -> as E2 where E1.DEPTNO=E2.DEPTNO);
+-------+-------+-----------+------+------------+------+------+--------+
| EMPNO | ENAME | JOB       | MGR  | HIREDATE   | SAL  | COMM | DEPTNO |
+-------+-------+-----------+------+------------+------+------+--------+
|  7499 | ALLEN | SALESMAN  | 7698 | 1981-02-18 | 1600 |  300 |     30 |
|  7566 | JONES | MANAGER   | 7839 | 1981-04-02 | 2975 | NULL |     20 |
|  7698 | BLAKE | MANAGER   | 7893 | 1981-05-01 | 2850 | NULL |     30 |
|  7788 | SCOTT | ANALYST   | 7566 | 1981-11-09 | 3000 | NULL |     20 |
|  7839 | KING  | PRESIDENT | NULL | 1981-11-17 | 5000 | NULL |     10 |
|  7902 | FORD  | ANALYST   | 7566 | 1981-12-03 | 3000 | NULL |     20 |
+-------+-------+-----------+------+------------+------+------+--------+
6 rows in set (0.000 sec)
```

Oppgave 2.1)

a) 161*21 = 3381 rader

b) SELECT * FROM Vare INNER JOIN Kategori ON Vare.KatNr = Kategori.KatNr

c) SELECT Ordrelinje.*, Vare.Betegnelse, Ordre.Ordredato
FROM Ordrelinje, Ordre, Vare
WHERE Ordrelinje.OrdreNr = Ordre.OrdreNr AND Ordrelinje.VNr = Vare.VNr

d) SELECT Ordrelinje.*, Vare.Betegnelse, Ordre.Ordredato,
Ordrelinje.Antall * Ordrelinje.PrisPrEnhet AS Beløp
FROM Ordrelinje, Ordre, Vare
WHERE Ordrelinje.OrdreNr = Ordre.OrdreNr AND Ordrelinje.VNr = Vare.VNr

e) Select Kunde.KNr, Kunde.Fornavn, Kunde.Etternavn,
Ordrelinje.Antall * Ordrelinje.PrisPrEnhet AS Beløp
From Ordrelinje, Ordre, Kunde
WHERE Ordrelinje.OrdreNr = Ordre.OrdreNr
AND Ordre.KNr = Kunde.KNr
Group By Kunde.KNr, Kunde.Fornavn, Kunde.Etternavn;

f) SELECT KNr, COUNT(*) AS AntallOrdrer
FROM Ordre
GROUP BY KNr;
Et Problem kan være at vi ikke tar hensyn til at en kunde kan ha flere KNr.

g) SELECT OrdreNr,
Antall * PrisPrEnhet AS TotalPrOrdre
FROM Ordrelinje
GROUP BY OrdreNr;

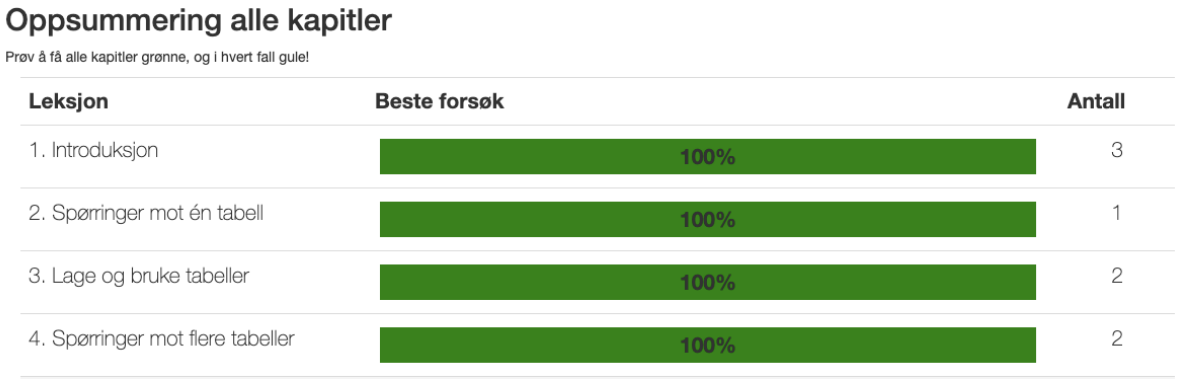
h) Select Betegnelse, Antall,
Antall*Pris AS Lagerverdi
From Vare;

i) Select Antal*Pris As LagerVerdi,
From Vare;

j) SELECT Kategori.KatNr, Kategori.Navn, SUM(Ordrelinje.Antall*PrisPrEnhet)
FROM Vare, Ordrelinje, Kategori
WHERE Vare.VNr = Ordrelinje.VNr AND Vare.KatNr = Kategori.KatNr
GROUP BY Kategori.KatNr
ORDER BY SUM(Ordrelinje.Antall*PrisPrEnhet) DESC;

k) SELECT DISTINCT Poststed.PostNr, Poststed.Poststed
FROM Ansatt, Kunde, Poststed
WHERE Ansatt.PostNr = Poststed.PostNr OR Kunde.PostNr = Poststed.PostNr;

Oppg.2.2)



Oppsummering alle kapitler

Prøv å få alle kapitler grønne, og i hvert fall gule!

Leksjon	Beste forsøk	Antall
1. Introduksjon	100%	3
2. Spørringer mot én tabell	100%	1
3. Lage og bruke tabeller	100%	2
4. Spørringer mot flere tabeller	100%	2