PRACTICUM DATA WAREHOUSE

‘Jobsheet 2 – Operational Databases’

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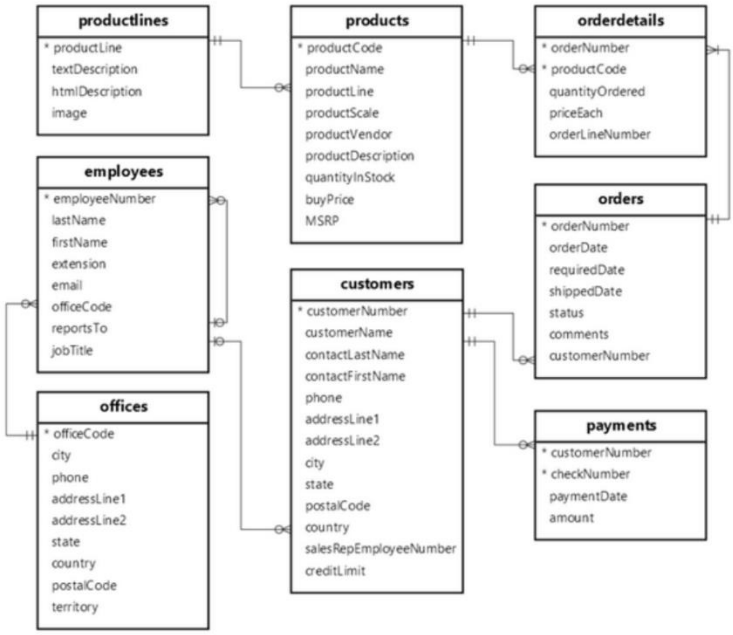
Class : SIB 2G

Tujuan Praktikum

Setelah melakukan praktikum ini, mahasiswa diharapakan dapat lebih mengenal data sumber, cara menganalisa serta melihat kebutuhan baik fungsional maupun non-fungsional dalam pengembangan data warehouse serta lebih memahami apa itu OLTP.

Studi Kasus

LegendVehicle merupakan perusahan jual-beli tukar-tambah kendaraan klasik. Perusahaan ini memiliki cabang di berbagai negara. LegendVehicle memiliki sistem informasi ERP sendiri. Salah satu modul dari sistem ERP tersebut adalah modul penjualan. Desain database dari modul tersebut adalah sebagai berikut:



Gambar desain modul penjualan

Selain itu proses penjualan kendaraan pada perusahaan tersebut bukan hanya melalui showroom cabang, melainkan reseller-reseller bebas lainnya.

Data penjualan dari cabang tersebut dapat diunduh melalui link berikut: >> Data Penjualan <<

Tugas 1

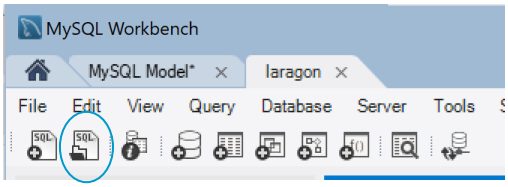
1. Import data perusahaan tersebut pada DBMS MySQL!
2. Analisa struktur data dari database perusahaan tersebut, dalam bentuk tabel, analisa hubungan setiap tabel nya!

Tabel 1	Tabel 2	Jenis Relasi
productlines	products	one to many
...	...	...
...	...	...

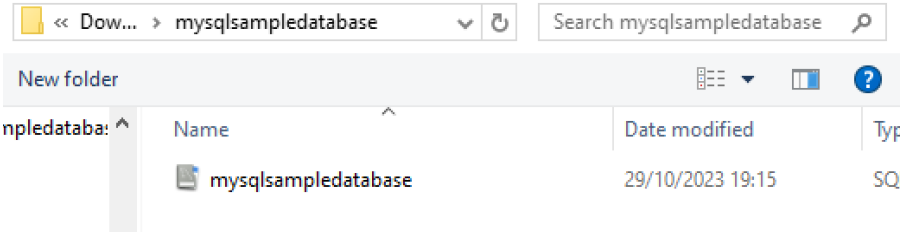
3. Analisa jumlah field pada setiap tabel!

Nama Tabel	Jumlah Field
...	...
...	...
...	...

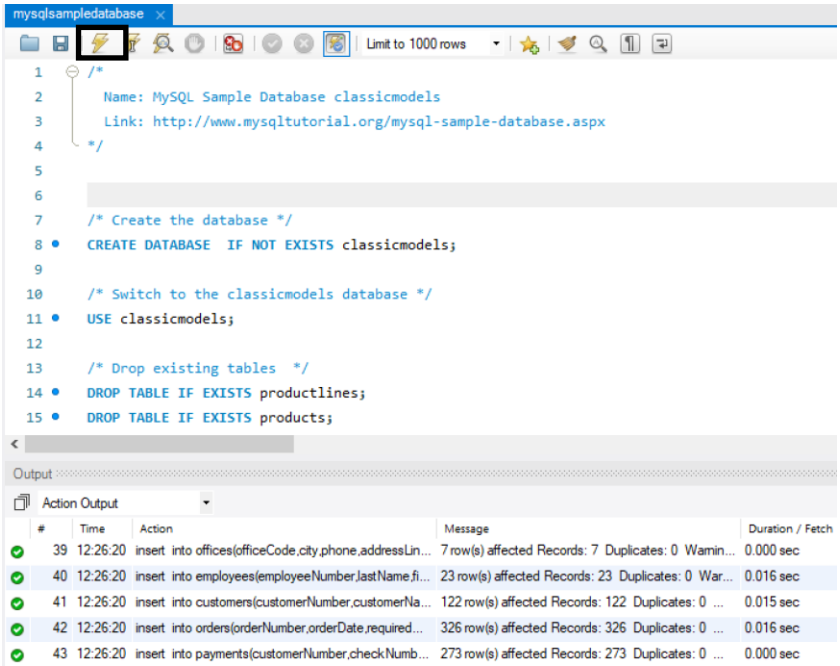
Open a database management tool such as phpMyAdmin or another similar tool. But now, I am using MySQL Workbench. After that, press the symbol like the one shown in the picture above.



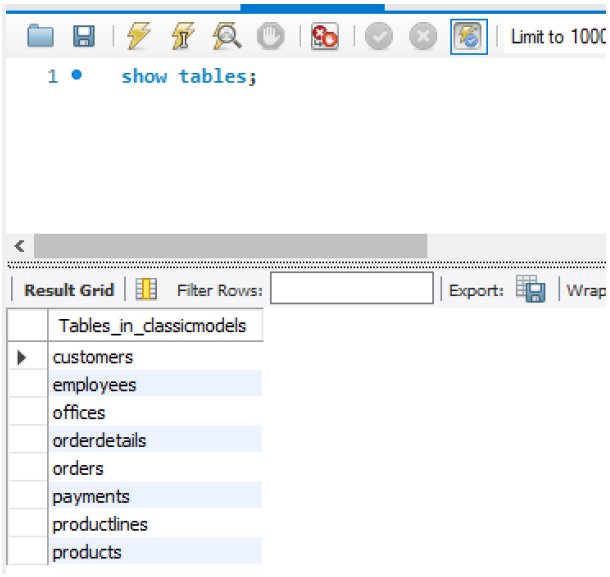
Select file do you ant to import in mysql workbench



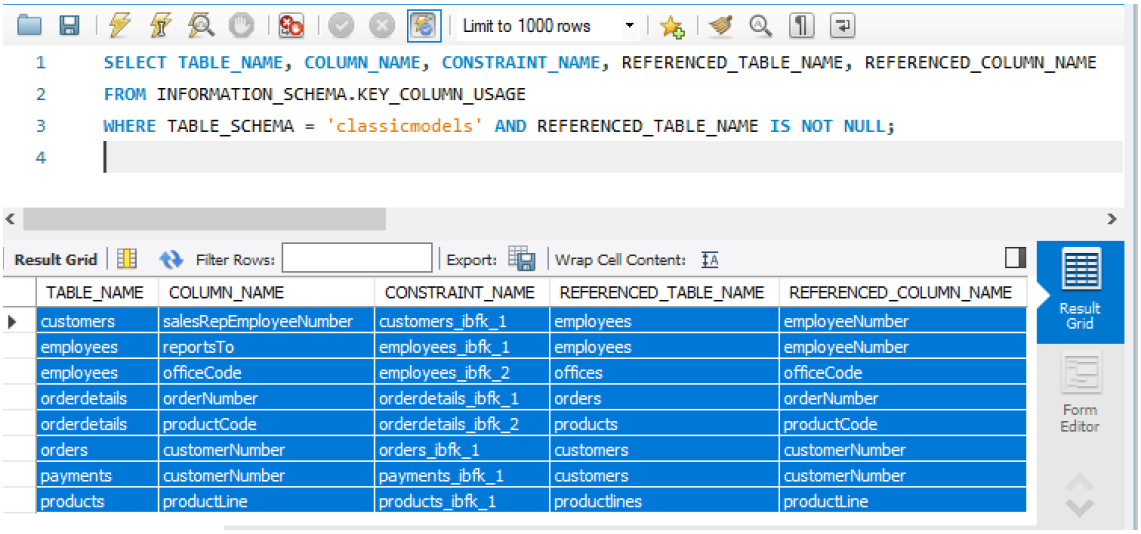
When you success import file, the display like the one shown I the picture above



To check what kind column in table classicmodels, the syntax is **“show tables”**



In picture above is to check what is foreign key between in other tables



From the data above we can conclude the relationship between the tables, namely:

Table name 1	Table name 2	Relation Type
customers	employees	Many to one (M:1)
employees	offices	Many to one (M:1)
orderdetails	orders	One to many (1:M)
orderdetails	products	Many to one (M:1)
orders	customers	Many to one (M:1)
payments	Customers	Many to one (M:1)
products	productlines	Many to one (M:1)

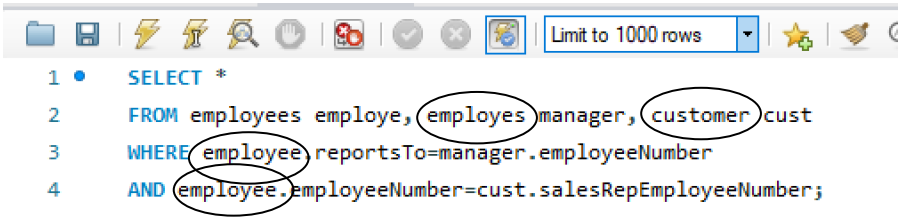
```
SELECT TABLE_NAME, COUNT(*) AS field
FROM INFORMATION_SCHEMA.COLUMNS
WHERE TABLE_SCHEMA = 'classicmodels'
GROUP BY TABLE_NAME;
```

Result Grid | Filter Rows: | Export

TABLE_NAME	field_total
customers	13
employees	8
offices	9
orderdetails	5
orders	7
payments	4
productlines	4
products	9

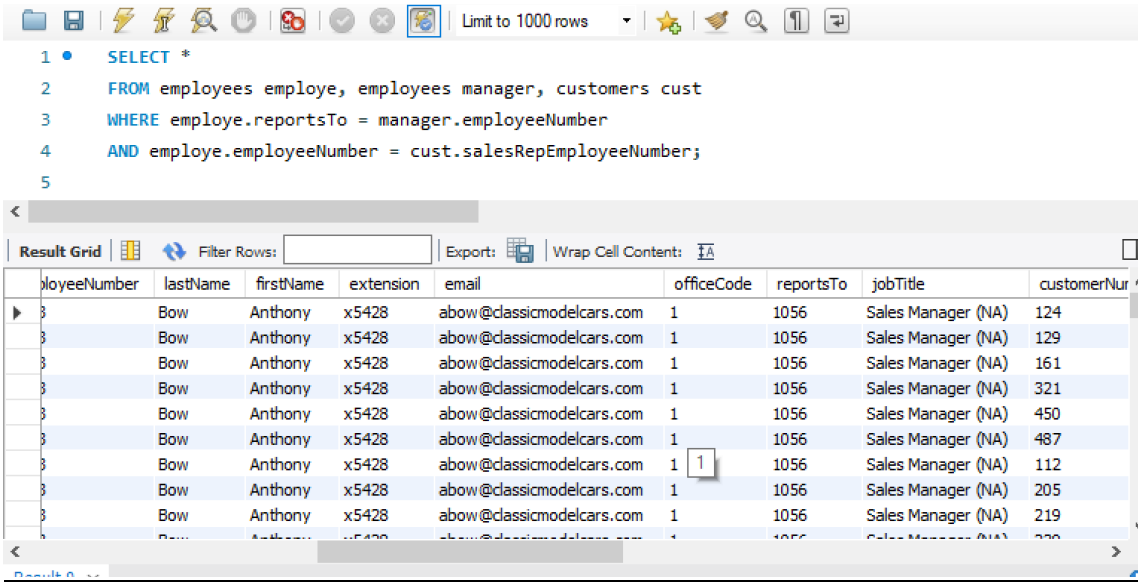
PRAKTIKUM 1

1. Jalankan **query** berikut pada **DBMS MySql** yang telah tersedia **data Perusahaan LegendVehicle.**



```
SELECT *
FROM employees employe, employes manager, customer cust
WHERE employee.reportsTo=manager.employeeNumber
AND employee.employeeNumber=cust.salesRepEmployeeNumber;
```

Apabila sesuai query diatas maka akan error dan tidak bisa dijalankan, hal ini dikarenakan adanya kesalahan dalam penulisan seperti yang sudah ditandain diatas.



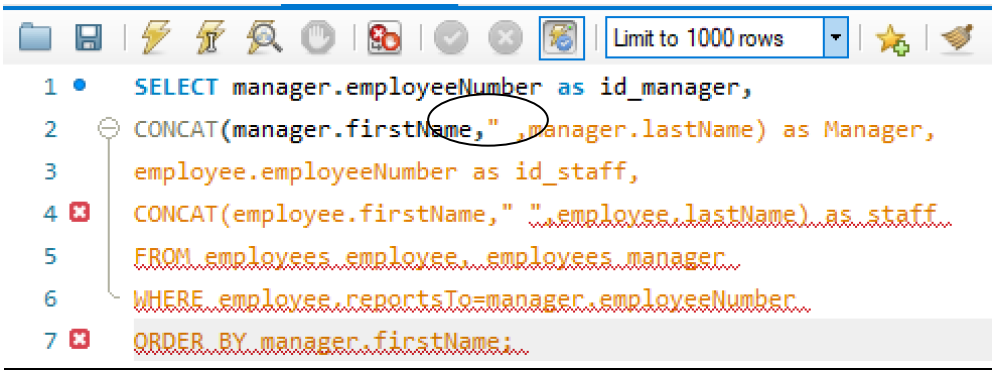
```
SELECT *
FROM employees employe, employees manager, customers cust
WHERE employe.reportsTo = manager.employeeNumber
AND employe.employeeNumber = cust.salesRepEmployeeNumber;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

loyeeNumber	lastName	firstName	extension	email	officeCode	reportsTo	jobTitle	customerNur
3	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	124
3	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	129
3	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	161
3	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	321
3	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	450
3	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	487
3	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	112
3	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	205
3	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)	219

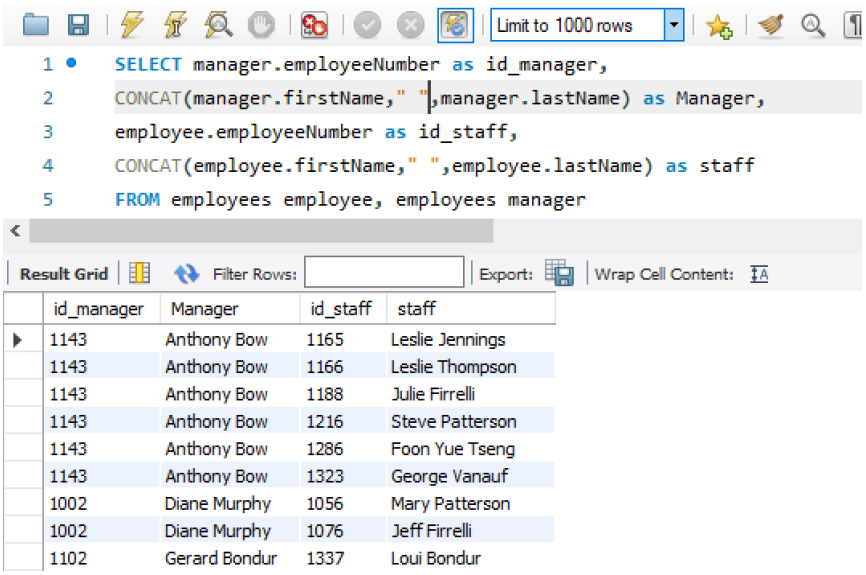
maka hasil dari query tersebut adalah data **Employee** beserta **Manajernya** dan **Customer** yang ia miliki. perhatikan hasil data dengan seksama.

2. Buka **tab baru** pada browser untuk melakukan eksekusi **query** berikut:



Apabila sesuai query diatas maka akan error dan tidak bisa dijalankan, hal ini dikarenakan adanya kesalahan dalam penulisan seperti yang sudah ditandain diatas.

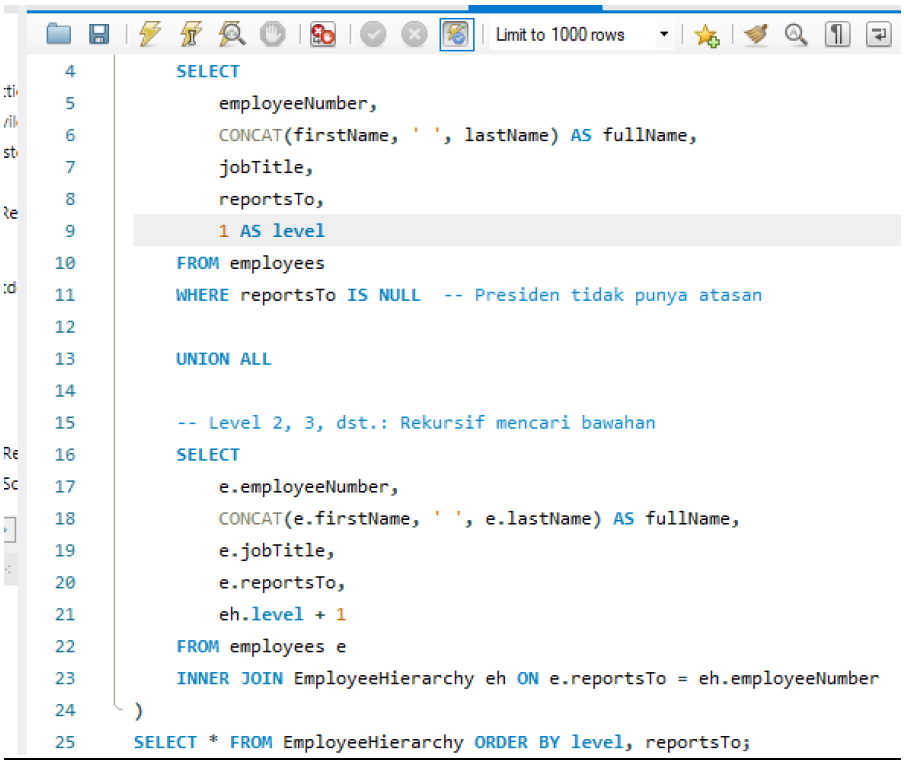
dari hasil query diatas maka akan ditemukan atasan dari setiap pegawai.



id_manager	Manager	id_staff	staff
1143	Anthony Bow	1165	Leslie Jennings
1143	Anthony Bow	1166	Leslie Thompson
1143	Anthony Bow	1188	Julie Firrelli
1143	Anthony Bow	1216	Steve Patterson
1143	Anthony Bow	1286	Foon Yue Tseng
1143	Anthony Bow	1323	George Vanauf
1002	Diane Murphy	1056	Mary Patterson
1002	Diane Murphy	1076	Jeff Firrelli
1102	Gerard Bondur	1337	Loui Bondur

TUGAS 2

1) Gambarlah hirarki organisasi berdasarkan atasan dari setiap pegawai sesuai dengan hasil praktikum diatas!



```
Limit to 1000 rows
4   SELECT
5       employeeNumber,
6       CONCAT(firstName, ' ', lastName) AS fullName,
7       jobTitle,
8       reportsTo,
9       1 AS level
10  FROM employees
11  WHERE reportsTo IS NULL  -- Presiden tidak punya atasan
12
13  UNION ALL
14
15  -- Level 2, 3, dst.: Rekursif mencari bawahan
16  SELECT
17      e.employeeNumber,
18      CONCAT(e.firstName, ' ', e.lastName) AS fullName,
19      e.jobTitle,
20      e.reportsTo,
21      eh.level + 1
22  FROM employees e
23  INNER JOIN EmployeeHierarchy eh ON e.reportsTo = eh.employeeNumber
24  )
25  SELECT * FROM EmployeeHierarchy ORDER BY level, reportsTo;
```

employeeNumber	fullName	jobTitle	reportsTo	level
1002	Diane Murphy	President	NULL	1
1056	Mary Patterson	VP Sales	1002	2
1076	Jeff Firrelli	VP Marketing	1002	2
1088	William Patterson	Sales Manager (APAC)	1056	3
1102	Gerard Bondur	Sale Manager (EMEA)	1056	3
1143	Anthony Bow	Sales Manager (NA)	1056	3
1621	Mami Nishi	Sales Rep	1056	3
1611	Andy Fixter	Sales Rep	1088	4
1612	Peter Marsh	Sales Rep	1088	4
1619	Tom King	Sales Rep	1088	4
1337	Loui Bondur	Sales Rep	1102	4
1370	Gerard Hernandez	Sales Rep	1102	4
1401	Pamela Castillo	Sales Rep	1102	4
1501	Larry Bott	Sales Rep	1102	4
1504	Barry Jones	Sales Rep	1102	4
1702	Martin Gerard	Sales Rep	1102	4
1165	Leslie Jennings	Sales Rep	1143	4
1166	Leslie Thompson	Sales Rep	1143	4
1188	Julie Firrelli	Sales Rep	1143	4
1216	Steve Patterson	Sales Rep	1143	4
1286	Foon Yue Tseng	Sales Rep	1143	4
1323	George Vanauf	Sales Rep	1143	4
1625	Yoshimi Kato	Sales Rep	1621	4

2) Buka **tab baru** pada browser untuk melakukan eksekusi **query** berikut:

```
SELECT manager.employeeNumber as id_manager,
concat(manager.firstName," ",manager.lastName) as Manager,
employee.employeeNumber as id_staff, concat(employee.firstName," ",employee.lastName) as staff,
count(cust.customerNumber) as total_cust
FROM employees employee join employees manager on employee.reportsTo = manager.employeeNumber
left join customers cust on employee.employeeNumber=cust.salesRepEmployeeNumber
GROUP BY employee.employeeNumber
ORDER BY manager.firstName;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

id_manager	Manager	id_staff	staff	total_cust
1143	Anthony Bow	1165	Leslie Jennings	6
1143	Anthony Bow	1166	Leslie Thompson	6
1143	Anthony Bow	1188	Julie Firrelli	6
1143	Anthony Bow	1216	Steve Patterson	6
1143	Anthony Bow	1286	Foon Yue Tseng	7
1143	Anthony Bow	1323	George Vanauf	8
1002	Diane Murphy	1056	Mary Patterson	0
1002	Diane Murphy	1076	Jeff Firrelli	0
1102	Gerard Bondur	1337	Loui Bondur	6
1102	Gerard Bondur	1370	Gerard Hernandez	7
1102	Gerard Bondur	1401	Pamela Castillo	10

dari query tersebut menghasilkan jumlah **customer** dari setiap **staff**.

Jika perusahaan tersebut memiliki **KPI (Key Performances Indicator) "Jumlah customer yang bertransaksi"** maka jawablah pertanyaan-pertanyaan berikut!

TUGAS 3

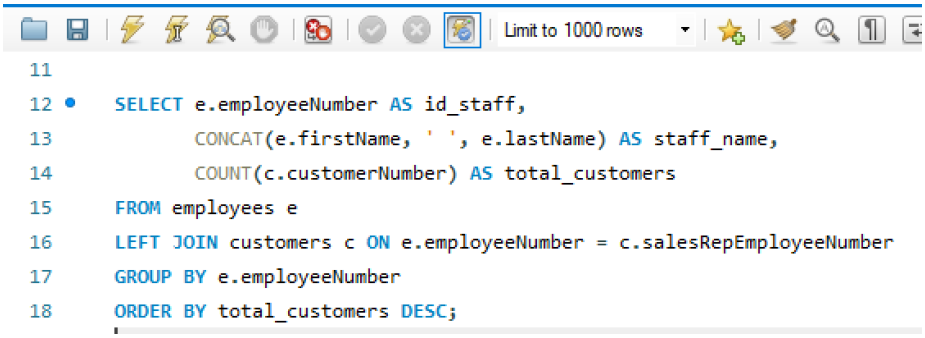
1. Siapakah staff dengan hirarki paling bawah yang berprestasi dilihat dari jumlah customer terbanyak?

```
SELECT e.employeeNumber AS id_staff,
       CONCAT(e.firstName, ' ', e.lastName) AS staff_name,
       COUNT(c.customerNumber) AS total_customers
FROM employees e
LEFT JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
LEFT JOIN employees e2 ON e.employeeNumber = e2.reportsTo  -- Mengecek apakah punya bawahan
WHERE e2.employeeNumber IS NULL  -- Ambil hanya yang tidak punya bawahan
GROUP BY e.employeeNumber
ORDER BY total_customers DESC
LIMIT 1;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

id_staff	staff_name	total_customers
1401	Pamela Castillo	10

2. Jika KPI atasan dihitung dari customer yang dimilikinya dijumlah dengan customer dari staff dibawahnya, urutkan ranking prestasi keseluruhan pegawai beserta keterangan jumlah customer yang dimilikinya!



```
11
12 •  SELECT e.employeeNumber AS id_staff,
13           CONCAT(e.firstName, ' ', e.lastName) AS staff_name,
14           COUNT(c.customerNumber) AS total_customers
15    FROM employees e
16    LEFT JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
17    GROUP BY e.employeeNumber
18    ORDER BY total_customers DESC;
```

Result Grid | Filter Rows:

id_staff	staff_name	total_customers
1188	Julie Firrelli	6
1216	Steve Patterson	6
1337	Loui Bondur	6
1702	Martin Gerard	6
1611	Andy Fixter	5
1612	Peter Marsh	5
1621	Mami Nishi	5
1002	Diane Murphy	0
1056	Mary Patterson	0
1076	Jeff Firrelli	0
1088	William Patterson	0
1102	Gerard Bondur	0
1143	Anthony Bow	0
1619	Tom King	0
1625	Yoshimi Kato	0

3. Analisa kembali data LegendVehicle untuk mendapatkan ranking pegawai berdasarkan KPI **"Jumlah omset yang didapat".** Urutkan ranking pegawai beserta keterangan dana yang didapat!

```
57 •  SELECT
58        e.employeeNumber AS id_pegawai,
59        CONCAT(e.firstName, ' ', e.lastName) AS nama_pegawai,
60        SUM(p.amount) AS total_omset
61    FROM employees e
62    JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
63    JOIN payments p ON c.customerNumber = p.customerNumber
64    GROUP BY e.employeeNumber
65    ORDER BY total_omset DESC;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

id_pegawai	nama_pegawai	total_omset
1370	Gerard Hernandez	1112003.81
1165	Leslie Jennings	989906.55
1401	Pamela Castillo	750201.87
1501	Larry Bott	686653.25
1504	Barry Jones	637672.65
1323	George Vanauf	584406.80
1337	Loui Bondur	569485.75
1611	Andy Fixter	509385.82
1612	Peter Marsh	497907.16
1286	Foon Yue Tseng	488212.67

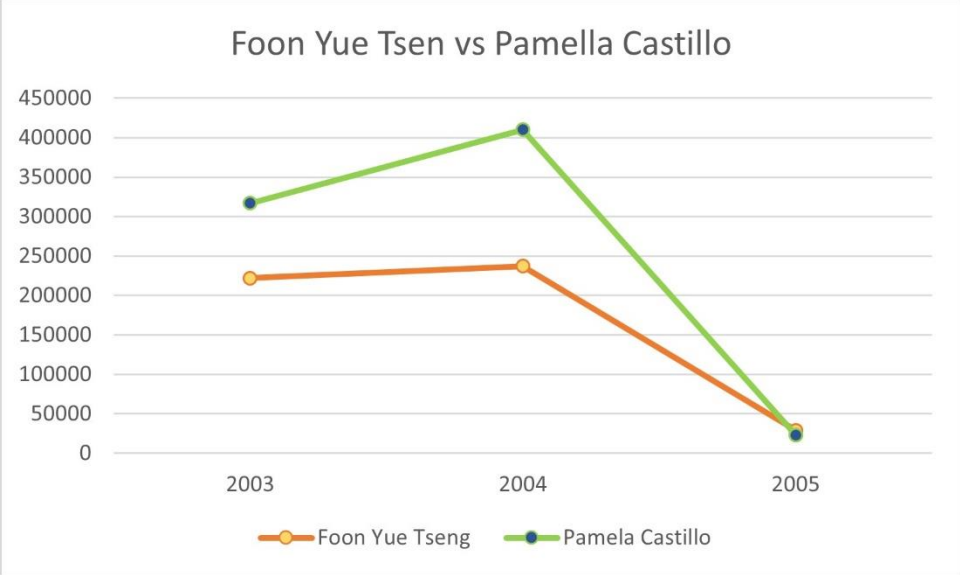
4. Jika KPI yang pertama merupakan "**Jumlah customer yang bertransaksi"** sedangkan KPI yang kedua **"Jumlah omset yang didapat".** Maka, berapakah jumlah field yang dibutuhkan untuk mendapatkan informasi tersebut?
   - ➔ 2 KPIs are required, namely total turnover from the calculation of the **amount** column in the payment table and total customers from the calculation of the **customerNumber** column in the customer table. Besides that, it also requires the **id_emloyee and name employee** fields to identify which employees get the number of customers and how much the total turnover is.

5. Buatlah report pertahun untuk KPI **"Jumlah omset yang didapat"** pada **Foon Yue Tseng** dan **Pamela Castillo**. Serta gambarkan grafiknya (grafik garis).

```sql
SELECT
    YEAR(p. paymentDate),
    CONCAT(e.firstName, ' ', e.lastName) AS employee_name,
    SUM(p.amount) AS total_omset
FROM employees e
JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
JOIN payments p ON c.customerNumber = p.customerNumber
WHERE CONCAT(e.firstName, ' ', e.lastName) IN ('Foon Yue Tseng', 'Pamela Castillo')
GROUP BY YEAR(p. paymentDate), e.employeeNumber
ORDER BY YEAR(p. paymentDate),total_omset ASC;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

YEAR(p. paymentDate)	employee_name	total_omset
2003	Foon Yue Tseng	221887.03
2003	Pamela Castillo	317104.78
2004	Foon Yue Tseng	237255.26
2004	Pamela Castillo	409910.07
2005	Pamela Castillo	23187.02
2005	Foon Yue Tseng	29070.38



STUDY CASE

Pak Huhut merupakan pemegang saham LegendVehicle. dia membutuhkan dashboard untuk melihat perkembangan penjualan (omset) disetiap cabang di tiap tahunnya. Dikarenakan perusahaan tersebut belum merekrut Data Engineer maka, penarikan informasi hanya bisa dilakukan melaluai OLTP yang ada.

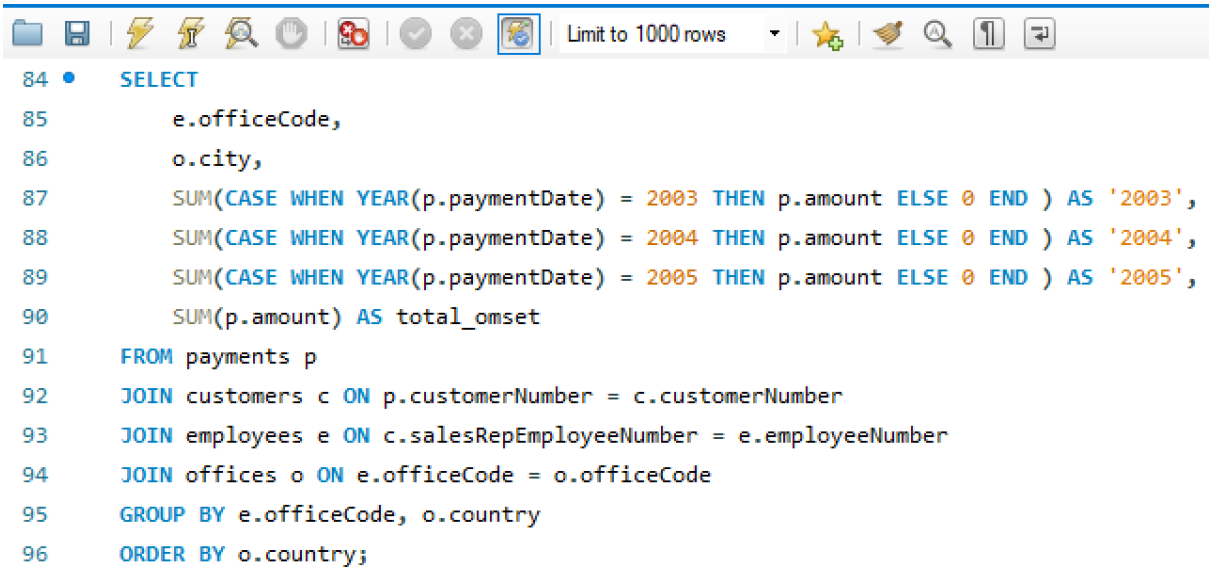
Hasil report yang diinginkan adalah grafik berdasarkan tabel berikut:

Analisalah terlebih dahulu:

1. Field apa saja yang diperlukan untuk menampilkan penjualan di setiap cabang.

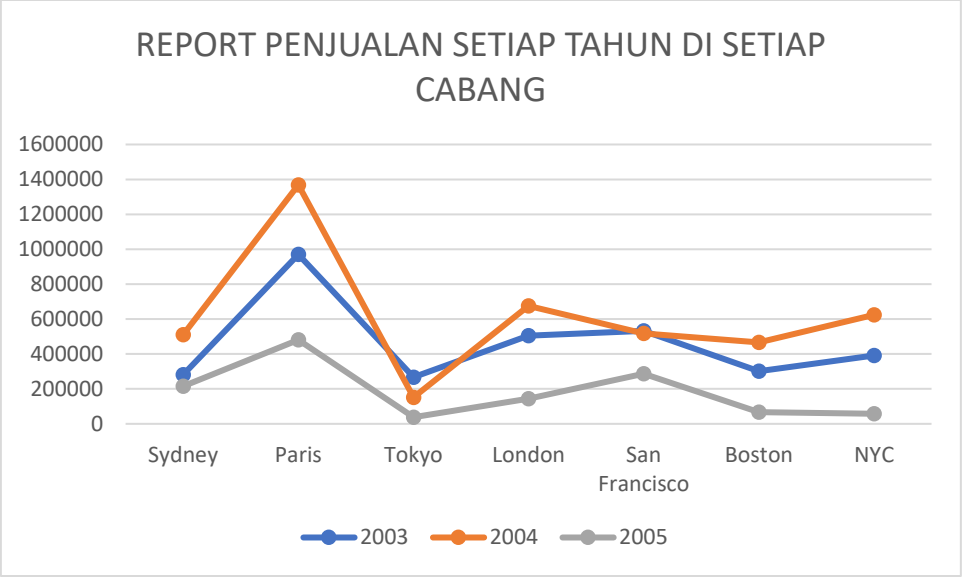
➔ Field yang dibutuhkan yaitu dari table offices (offices code, country), dari table payments (amount, payment date), dari table product (productCode, product name)

2. Bentuk query dengan memperhatikan relasi antar tabel.
SOAL BONUS: buatlah report lain dengan sumber data OLTP yang sama, analisa field yang digunakan, bentuk struktur query dan tuliskan dalam tabel serta grafiknya.



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

officeCode	city	2003	2004	2005	total_omset
6	Sydney	281985.51	509833.62	215473.85	1007292.98
4	Paris	969959.90	1368458.96	480750.04	2819168.90
5	Tokyo	267249.40	151761.45	38099.22	457110.07
7	London	505384.85	674815.75	144125.30	1324325.90
1	San Francisco	532681.13	517408.62	287349.83	1337439.58
2	Boston	301781.38	467177.07	66923.88	835882.33


REPORT PENJUALAN SETIAP TAHUN DI SETIAP CABANG
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0
Sydney
Paris
Tokyo
London
San Francisco
Boston
NYC
2003
2004
2005