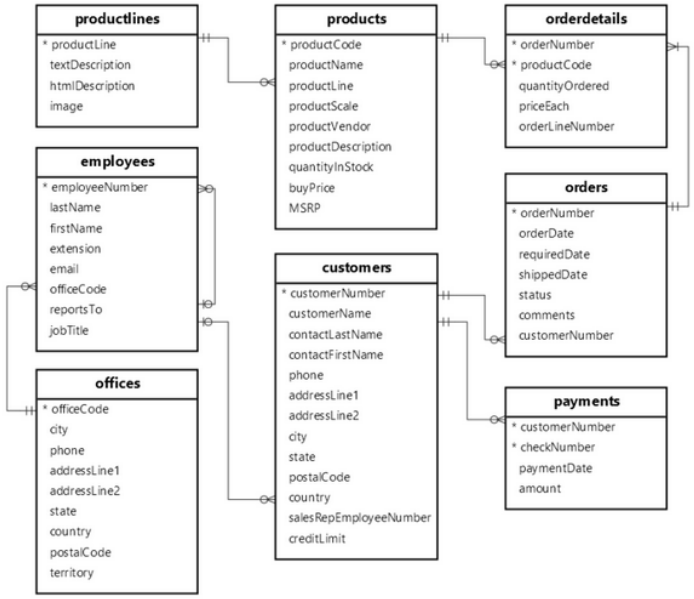
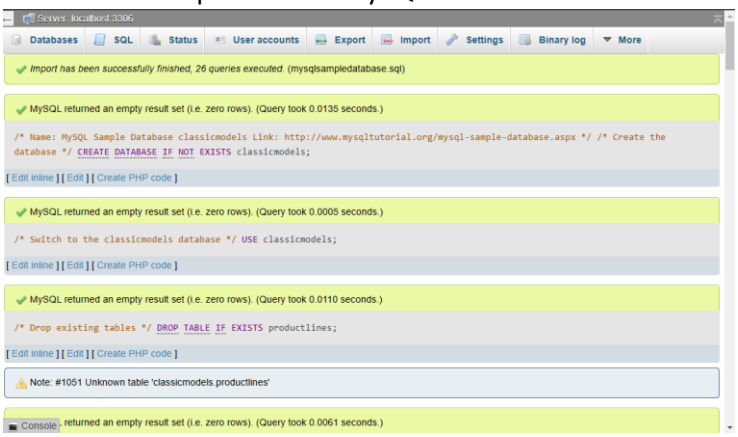
Studi Kasus

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:



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
employees	employees	one to many (self-referencing)
offices	employees	one to many
employees	customers	one to many

customers	payments	one to many
customers	orders	one to many
orders	orderdetails	one to many
products	orderdetails	one to many

3. Analisislah jumlah field pada setiap tabel

Nama Tabel	Jumlah field
productlines	4
employees	9
offices	9
employees	8
customers	13
payments	4
orders	7
ordersdetail	5

PRAKTIKUM 1

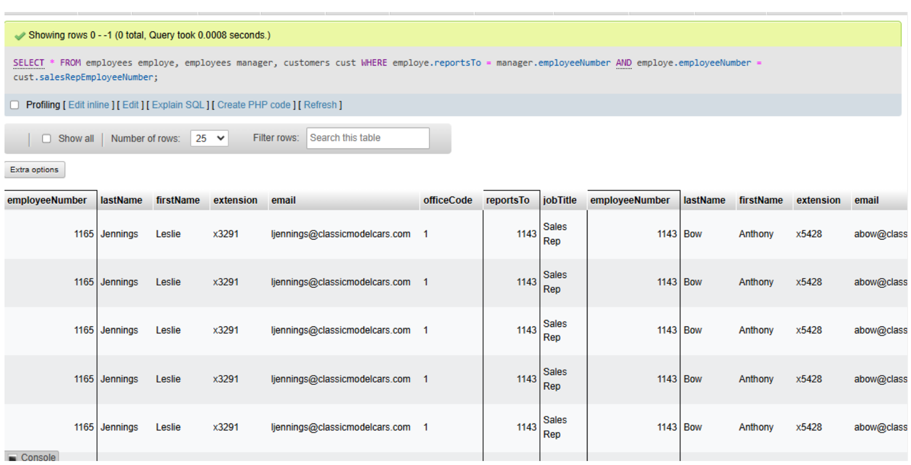
1. Jalankan query berikut pada DBMS MySql yang telah tersedia data Perusahaan LegendVehicle.

   SELECT *

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

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

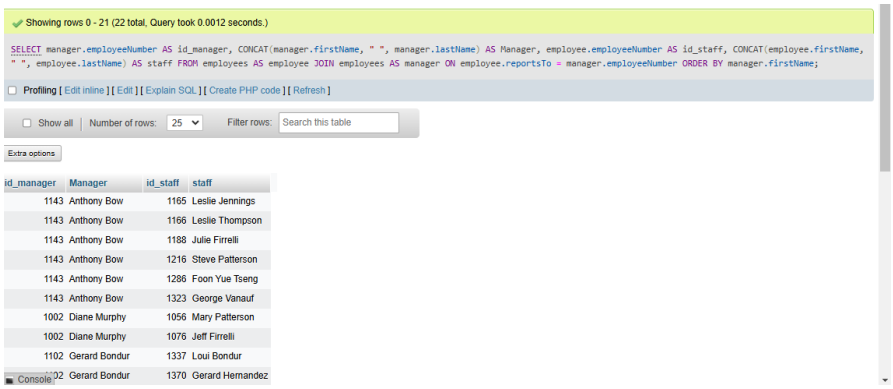
   Hasil :



2. Buka tab baru pada browser untuk melakukan eksekusi query berikut:
   SELECT manager.employeeNumber as id_manager,
   CONCAT(manager.firstName," ,manager.lastName) as Manager,

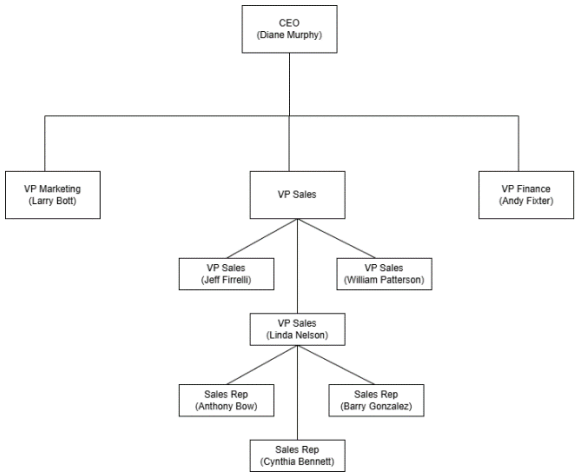
employee.employeeNumber as id_staff,
CONCAT(employee.firstName," ",employee.lastName) as staff
FROM employees employee, employees manager
WHERE employee.reportsTo=manager.employeeNumber
ORDER BY manager.firstName;

Hasil :

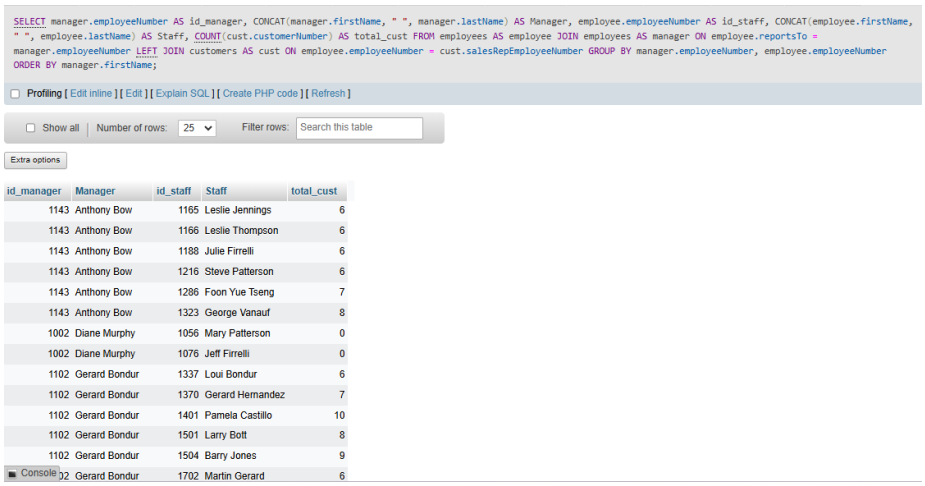


TUGAS 2

1. Gambarlah hirarki organisasi berdasarkan atasan dari setiap pegawai sesuai dengan hasil prkatikum diatas!



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.reportsTomanager.employeeNumber
left join customers cust on employee.employeeNumber=cust.salesRepEmployeeNumber
GROUP BY employee.employeeNumber
ORDER BY manager.firstName;



```
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 AS employee JOIN employees AS manager ON employee.reportsTo =
manager.employeeNumber LEFT JOIN customers AS cust ON employee.employeeNumber = cust.salesRepEmployeeNumber GROUP BY manager.employeeNumber, employee.employeeNumber
ORDER BY manager.firstName;
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 Filter rows: Search this table

Extra options

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
1102	Gerard Bondur	1501	Larry Bott	8
1102	Gerard Bondur	1504	Barry Jones	9
Console	02 Gerard Bondur	1702	Martin Gerard	6

TUGAS 3

1. Siapakah staff dengan hirarki paling bawah yang berprestasi dilihat dari jumlah customer terbanyak?
    - Dilihat dengan menggunakan query sebagai berikut:

      ```
      SELECT
        employee.employeeNumber AS id_staff,
        CONCAT(employee.firstName, " ", employee.lastName) AS Staff,
        COUNT(customers.customerNumber) AS total_cust
      FROM employees AS employee
      LEFT JOIN customers ON employee.employeeNumber =
      customers.salesRepEmployeeNumber
      WHERE employee.employeeNumber NOT IN (SELECT reportsTo FROM employees
      WHERE reportsTo IS NOT NULL)
      GROUP BY employee.employeeNumber
      ORDER BY total_cust DESC
      LIMIT 1;
      ```
    - Hasilnya:

id_staff	Staff	total_cust
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!
    - Dapat dilakukan dengan menggunakan query berikut:

      ```
      WITH RECURSIVE StaffHierarchy AS (
        -- Step 1: Ambil setiap pegawai dan jumlah customer langsungnya
        SELECT
          e.employeeNumber,
          e.reportsTo,
          CONCAT(e.firstName, " ", e.lastName) AS Staff,
      ```

```
    COUNT(c.customerNumber) AS direct_customers
  FROM employees e
  LEFT JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
  GROUP BY e.employeeNumber, e.reportsTo

  UNION ALL

  -- Step 2: Membangun hirarki tanpa agregasi
  SELECT
    e.employeeNumber,
    e.reportsTo,
    CONCAT(e.firstName, " ", e.lastName) AS Staff,
    h.direct_customers  -- Tidak menggunakan SUM()
  FROM StaffHierarchy h
  JOIN employees e ON h.reportsTo = e.employeeNumber
)
-- Step 3: Agregasi akhir di luar CTE
SELECT
  h1.employeeNumber AS id_staff,
  h1.Staff,
  SUM(h2.direct_customers) AS total_customers
FROM StaffHierarchy h1
LEFT JOIN StaffHierarchy h2 ON h1.employeeNumber = h2.reportsTo
GROUP BY h1.employeeNumber, h1.Staff
ORDER BY total_customers DESC;
```

- Hasilnya:

	id_staff	Staff	total_customers
Edit Copy Delete	1002	Diane Murphy	2300
Edit Copy Delete	1056	Mary Patterson	2100
Edit Copy Delete	1102	Gerard Bondur	322
Edit Copy Delete	1143	Anthony Bow	273
Edit Copy Delete	1088	William Patterson	40
Edit Copy Delete	1621	Mami Nishi	0
Edit Copy Delete	1076	Jeff Firrelli	NULL
Edit Copy Delete	1165	Leslie Jennings	NULL
Edit Copy Delete	1166	Leslie Thompson	NULL
Edit Copy Delete	1188	Julie Firrelli	NULL
Edit Copy Delete	1216	Steve Patterson	NULL
Edit Copy Delete	1286	Foon Yue Tseng	NULL
Edit Copy Delete	1323	George Vanauf	NULL
Edit Copy Delete	1337	Loui Bondur	NULL
Edit Copy Delete	1370	Gerard Hernandez	NULL
Edit Copy Delete	1401	Pamela Castillo	NULL
Edit Copy Delete	1501	Larry Bott	NULL
Console it Copy Delete	1504	Barry Jones	NULL

3. Analisa kembali data LegendVehicle untuk mendapatkan ranking pegawai berdasarkan KPI "Jumlah omset yang didapat". Urutkan ranking pegawai beserta keterangan dana yang didapat!
    - Hasil dapat dilihat dengan menjalankan query berikut:

```
WITH RECURSIVE StaffRevenue AS (
  -- Step 1: Menghitung total omset langsung per pegawai
  SELECT
    e.employeeNumber,
```

```
    e.reportsTo,
    CONCAT(e.firstName, " ", e.lastName) AS Staff,
    COALESCE(SUM(p.amount), 0) AS direct_revenue
  FROM employees e
  LEFT JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
  LEFT JOIN payments p ON c.customerNumber = p.customerNumber
  GROUP BY e.employeeNumber, e.reportsTo

  UNION ALL

  -- Step 2: Menambahkan omset dari bawahan ke atasan
  SELECT
    e.employeeNumber,
    e.reportsTo,
    CONCAT(e.firstName, " ", e.lastName) AS Staff,
    h.direct_revenue  -- Tidak ada agregasi di dalam CTE rekursif
  FROM StaffRevenue h
  JOIN employees e ON h.reportsTo = e.employeeNumber
)
-- Step 3: Agregasi akhir di luar CTE
SELECT
  h1.employeeNumber AS id_staff,
  h1.Staff,
  SUM(h2.direct_revenue) AS total_revenue
FROM StaffRevenue h1
LEFT JOIN StaffRevenue h2 ON h1.employeeNumber = h2.reportsTo
GROUP BY h1.employeeNumber, h1.Staff
ORDER BY total_revenue DESC;
```

- Hasil:

	id_staff	Staff	total_revenue
Edit Copy Delete	1002	Diane Murphy	203638302.29
Edit Copy Delete	1056	Mary Patterson	185930623.83
Edit Copy Delete	1102	Gerard Bondur	29004463.60
Edit Copy Delete	1143	Anthony Bow	22721589.66
Edit Copy Delete	1088	William Patterson	4029171.92
Edit Copy Delete	1621	Mami Nishi	0.00
Edit Copy Delete	1076	Jeff Firrelli	NULL
Edit Copy Delete	1165	Leslie Jennings	NULL
Edit Copy Delete	1166	Leslie Thompson	NULL
Edit Copy Delete	1188	Julie Firrelli	NULL
Edit Copy Delete	1216	Steve Patterson	NULL
Edit Copy Delete	1286	Foon Yue Tseng	NULL
Edit Copy Delete	1323	George Vanauf	NULL
Edit Copy Delete	1337	Loui Bondur	NULL
Edit Copy Delete	1370	Gerard Hernandez	NULL
Edit Copy Delete	1401	Pamela Castillo	NULL
Edit Copy Delete	1501	Larry Bott	NULL
Console Edit Copy Delete	1504	Barry Jones	NULL

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?

KPI	Field Yang Dibutuhkan	Jumlah Field
Jumlah customer yang bertransaksi	employeeNumber, Staff, total_customers (COUNT DISTINCT customerNumber)	3
Jumlah omset yang didapat	employeeNumber, Staff, total_revenue (SUM amount)	3

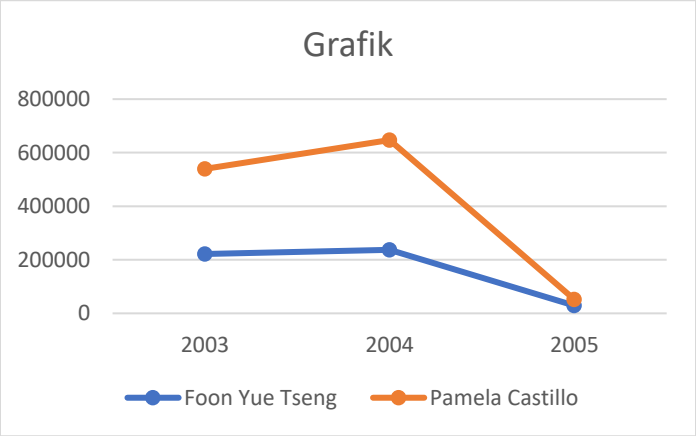
5. Buatlah report pertahun untuk KPI "Jumlah omset yang didapat" pada Foon Yue Tseng dan Pamela Castillo. Serta gambarkan grafiknya (grafik garis).
   - Menjalankan sql agar mengetahui data omsetnya, berikut sql nya;

```
SELECT
   e.employeeNumber,
   CONCAT(e.firstName, ' ', e.lastName) AS Staff,
   YEAR(p.paymentDate) AS Tahun,
   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 e.firstName IN ('Foon Yue', 'Pamela')
 AND e.lastName IN ('Tseng', 'Castillo')
GROUP BY e.employeeNumber, Staff, Tahun
ORDER BY Staff, Tahun;
```

   - Hasil saat sudah dletakkan pada tabel:

Nama	2003	2004	2005
Foon Yue Tseng	221887.03	237255.26	29070.38
Pamela Castillo	317104.78	409910.07	23187.02

   - Grafik garis



SOAL STUDI KASUS

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.

Analisalah terlebih dahulu:

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

Field	Sumber relasi	Keterangan
OficeCode	Offices	Kode unik abang
City	Offices	Nama kota cabang
paymentDate	Payments	Tanggal pembayaran
Amount	Payments	Total transaksi
customerNumber	Customers	Id pelanggan
salesRepEmployeeNumber	Customers	Pegawai yang menangani pelanggan
Employeenumber	Employees	Id pegawai
officecode	employees	Cabang tempat pegwai bekerja

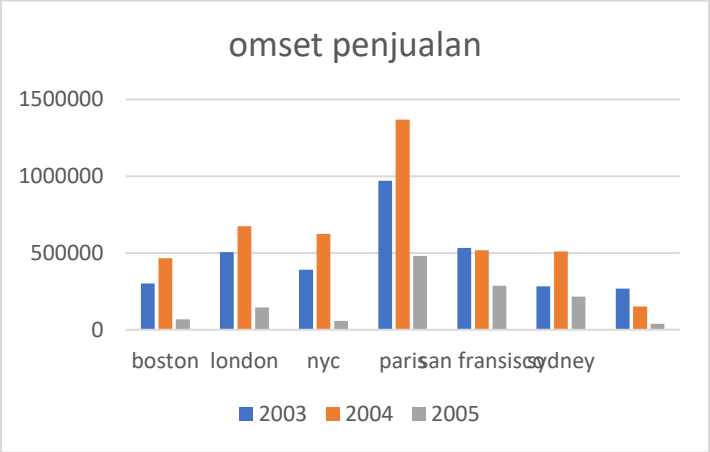
2. Bentuk query dengan memperhatikan relasi antar tabel.
    - Berikut untuk penerapan querynya

```
SELECT
  o.city AS Nama_Cabang,
  YEAR(p.paymentDate) AS Tahun,
  SUM(p.amount) AS Total_Omset
FROM payments p
JOIN customers c ON p.customerNumber = c.customerNumber
JOIN employees e ON c.salesRepEmployeeNumber = e.employeeNumber
JOIN offices o ON e.officeCode = o.officeCode
GROUP BY o.city, Tahun
ORDER BY o.city, Tahun;
```

3. Hasil yang didapatkan sert grafiknya

nama cabang	2003	2004	2005
boston	301781.38	467177.07	66923.88
london	505384.85	674815.75	144125.3
nyc	391175.53	623872.78	57571.16
paris	969959.9	1368458.96	480750.04
san fransisco	532681.13	517408.62	287349.83
sydney	281985.51	509833.62	215473.85
tokyo	267249.4	151761.45	38099.22

Nama_Cabang	Tahun ▲ 2	Total_Omset
Boston	2003	301781.38
Boston	2004	467177.07
Boston	2005	66923.88
London	2003	505384.85
London	2004	674815.75
London	2005	144125.30
NYC	2003	391175.53
NYC	2004	623872.78
NYC	2005	57571.16
Paris	2003	969959.90
Paris	2004	1368458.96
Paris	2005	480750.04
San Francisco	2003	532681.13
San Francisco	2004	517408.62
San Francisco	2005	287349.83
Sydney	2003	281985.51
Sydney	2004	509833.62



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

- Menmapilkan jumlah transaksi per cabang

Field	Sumber relasi	Keterangan
OficeCode	Offices	Kode unik abang
City	Offices	Nama kota cabang
paymentDate	Payments	Tanggal pembayaran
Amount	Payments	Total transaksi
customerNumber	Customers	Id pelanggan
salesRepEmployeeNumber	Customers	Pegawai yang menangani pelanggan
Employeenumber	Employees	Id pegawai
officecode	employees	Cabang tempat pegwai bekerja

- Query yang digunakan

```
SELECT
   o.city AS Nama_Cabang,
   YEAR(ord.orderDate) AS Tahun,
   COUNT(ord.orderNumber) AS Total_Transaksi
FROM orders ord
JOIN customers c ON ord.customerNumber = c.customerNumber
JOIN employees e ON c.salesRepEmployeeNumber = e.employeeNumber
JOIN offices o ON e.officeCode = o.officeCode
GROUP BY o.city, Tahun
ORDER BY o.city, Tahun;
```

Nama_Cabang	Tahun ▲ 2	Total_Transaksi
Boston	2003	9
Boston	2004	18
Boston	2005	5
London	2003	18
London	2004	24
London	2005	5
NYC	2003	14
NYC	2004	22
NYC	2005	3
Paris	2003	34
Paris	2004	49
Paris	2005	23
San Francisco	2003	17
San Francisco	2004	17
San Francisco	2005	14
Sydney	2003	12
Sydney	2004	15
Sydney	2005	11
Tokyo	2003	7

- Tabelnya

nama cabang	2003	2004	2005
boston	9	18	5
london	18	24	5
nyc	14	22	3
paris	34	23	17
san francisco	17	17	14
sydney	12	15	11
tokyo	7	6	3

- Grafiknya