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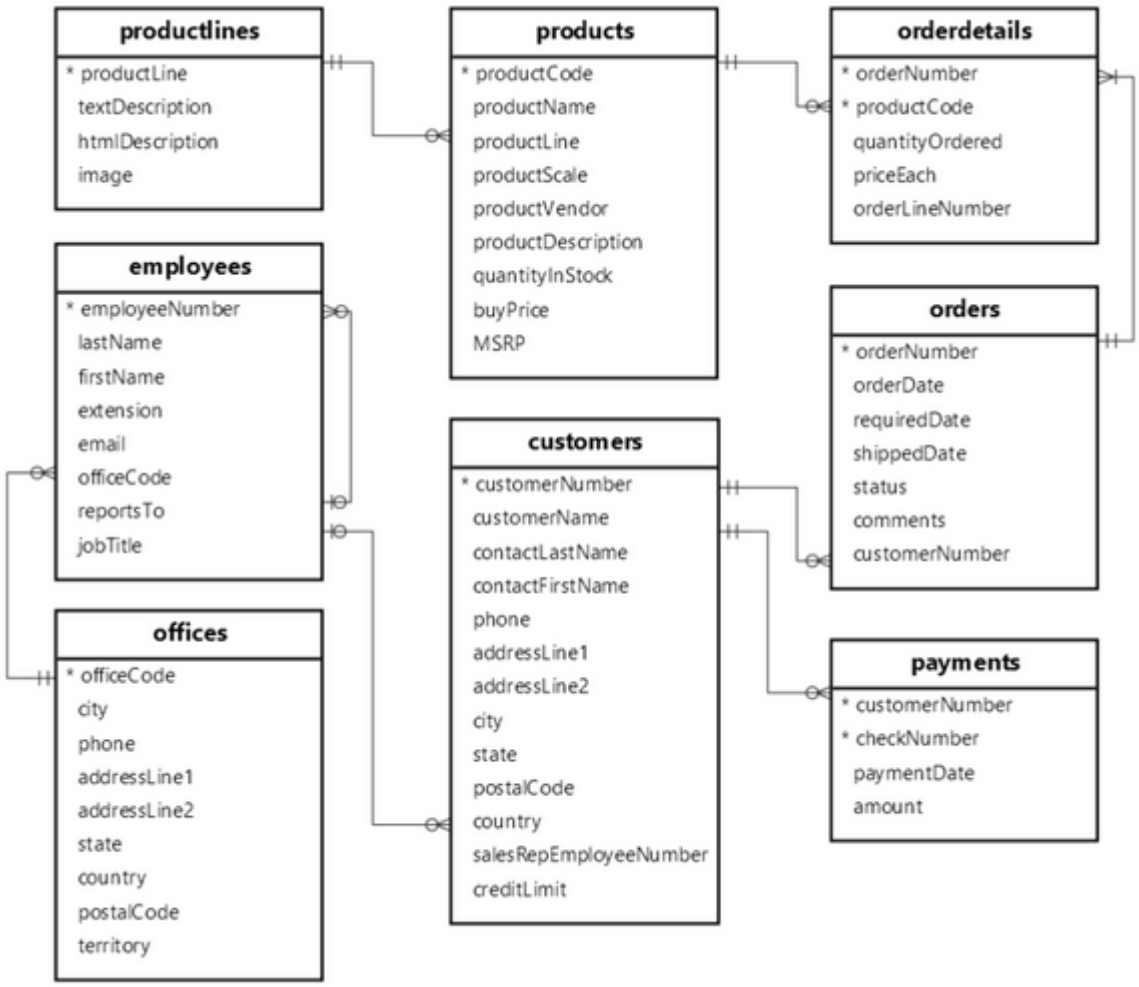
Jobsheet 2
Database Operasional

Study Case:

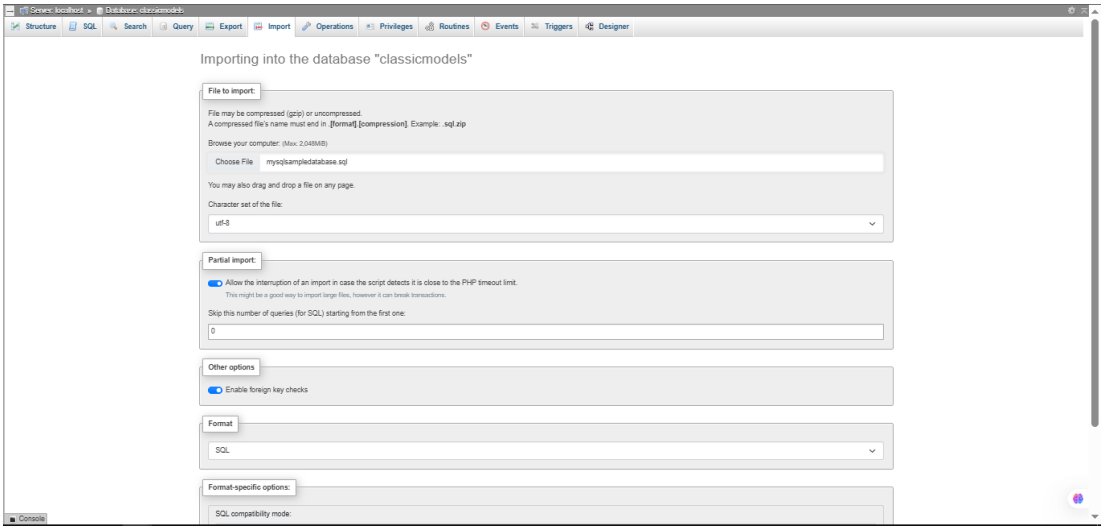
LegendVehicle merupakan perusahan jual-beli tukar-tambah kendaraan klasik. Perusahaan ini memiliki cabang di berbagai negara. LegendVehicle memiliki sistem informasi ERP sendiri. Salah satu modul dari sistem ERP tersebut adalah modul penjualan. Desain database dari modul tersebut adalah sebagai berikut:



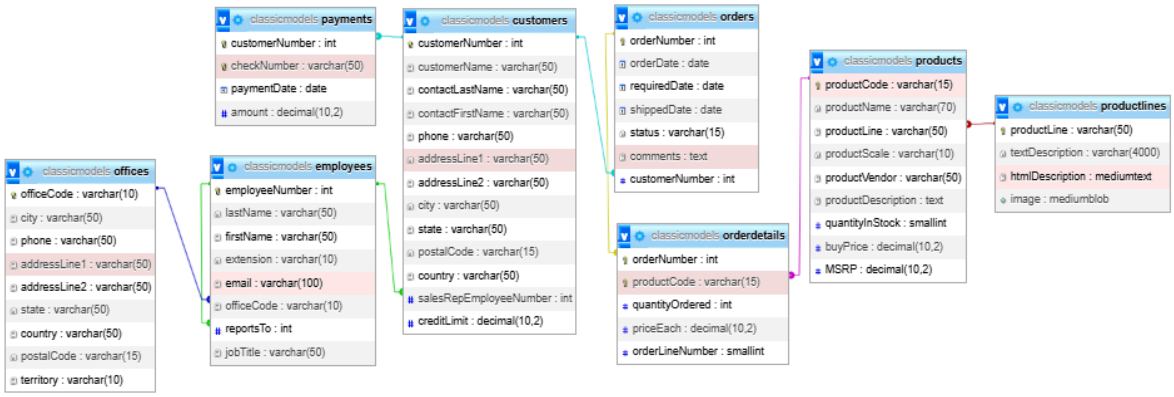
Selain itu proses penjualan kendaraan pada perusahaan tersebut bukan hanya melalui showroom cabang, melainkan reseller-reseller bebas lainnya.

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!



- offices: berisi informasi Perusahaan
- employees: berisi data pegawai perusahaan
- customers: berisi informasi pelanggan Perusahaan
- payments: berisi informasi pembayaran pelanggan
- orders: berisi informasi pesanan pelanggan
- orderdetails: berisi detail pesanan pelanggan
- products: berisi informasi produk
- productlines: berisi informasi kategori produk
- credentials: berisi informasi akses pengguna

Table 1	Table 2	Jenis relasi	Deskripsi
offices	employees	One-to-Many	Satu Perusahaan memiliki banyak pegawai
employees	customers	One-to-Many	Satu pegawai dapat mewakili

			penjualan dari banyak pelanggan
customers	payments	One-to-Many	Satu pegawai dapat melakukan banyak pembayaran
cutomers	orders	One-to-Many	Satu pelanggan dapat melakukan banyak pesanan
orders	orderlines	One-to-Many	Satu pesanan dapat memiliki banyak detail pesanan
products	orderdetails	One-to-Many	Satu produk dapat muncul di banyak detail pesanan
productlines	products	One-to-Many	Satu kategori produk dapat memiliki banyak produk

3. Analisa jumlah field pada setiap table!

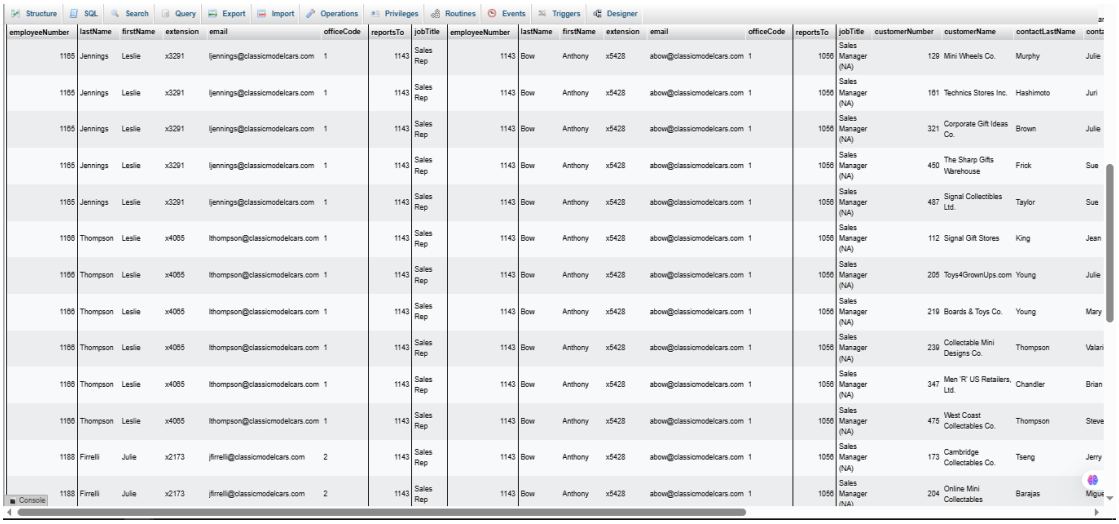
Table	Jumlah field	Daftar field
offices	9	officeCode, city, phone, addressLine1, addressLine2, state, country, postalCode, territory
employees	9	employeeNumber, lastName, firstName, extension, email, officeCode, reportsTo, jobTitle
customers	9	customerNumber, customerName, contactLastName, contactFirstName, phone, addressLine1, addressLine2, city, state, postalCode, country, salesRepEmployeeNumber, creditLimit
orders	6	orderNumber, orderDate, requiredDate, shippedDate, status, comments, customerNumber
orderdetails	5	orderNumber, productCode, quantityOrdered, priceEach, orderLineNumber
payments	4	customerNumber, checkNumber, paymentDate, amount
products	9	productCode, productName, productLine, productScale,

		productVendor, productDescription, quantityInStock, buyPrice, MSRP
productlines	4	productLine, textDescription, htmlDescription, image
credentials	3	username, password, MSPR

Praktikum 1
Analisa Data

1. Menampilkan data ‘employee’ dan ‘manajer’ dan ‘customer’ yang dimiliki

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



2. Menampilkan ‘manajer’ dari setiap ‘employee’

```
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;
```

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
1102	Gerard Bondur	1370	Gerard Hernandez
1102	Gerard Bondur	1401	Pamela Castillo
1102	Gerard Bondur	1501	Larry Bott
1102	Gerard Bondur	1504	Barry Jones
1102	Gerard Bondur	1702	Martin Gerard
1621	Mami Nishi	1625	Yoshimi Kato
1056	Mary Patterson	1088	William Patterson
1056	Mary Patterson	1102	Gerard Bondur
1056	Mary Patterson	1143	Anthony Bow
1056	Mary Patterson	1621	Mami Nishi
1088	William Patterson	1611	Andy Fixter
1088	William Patterson	1612	Peter Marsh
1088	William Patterson	1619	Tom King

Tugas 2

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

Anthony Bow (1143)
- Leslie Jennings (1165)
- Leslie Thompson (1168)
- Julie Firrelli (1188)
- Steve Patterson (1216)
- Foon Yue Tseng (1288)
- George Vanafu (1323)

Diane Murphy (1002)
- Mary Patterson (1058)
- Jeff Firrelli (1076)

Gerard Bondur (1102)
- Loui Bondur (1337)
- Gerard Hernandez (1370)
- Pamela Castillo (1401)
- Larry Bott (1501)
- Barry Jones (1504)
- Martin Gerard (1702)

Mami Nishi (1621)
- Yoshimi Kato (1625)

Mary Patterson (1056)
- William Patterson (1088)
- Gerard Bondur (1102)
- Anthony Bow (1143)
- Mami Nishi (1621)

William Patterson (1088)
- Andy Fixter (1611)
- Peter Marsh (1612)
- Tom King (1619)

2. Menampilkan jumlah ‘customers’ dari setiap ‘employees’

```sql
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
    employee.employeeNumber
ORDER BY
    manager.firstName;
```

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
1102	Gerard Bondur	1702	Martin Gerard	6
1621	Mami Nishi	1625	Yoshimi Kato	0
1056	Mary Patterson	1088	William Patterson	0
1056	Mary Patterson	1102	Gerard Bondur	0
1056	Mary Patterson	1143	Anthony Bow	0
1056	Mary Patterson	1621	Mami Nishi	5
1088	William Patterson	1611	Andy Fixter	5
1088	William Patterson	1612	Peter Marsh	5
1088	William Patterson	1619	Tom King	0

Tugas 3

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

id_staff	staff	total_cust
1401	Pamela Castillo	10

```sql
SELECT
    employee.employeeNumber AS id_staff,
    CONCAT(employee.firstName, ' ', employee.lastName) AS staff,
    COUNT(cust.customerNumber) AS total_cust
FROM
    employees AS employee
LEFT JOIN
    customers AS cust ON employee.employeeNumber = cust.salesRepEmployeeNumber
WHERE
    employee.employeeNumber NOT IN (
        SELECT DISTINCT reportsTo
        FROM employees
        WHERE reportsTo IS NOT NULL
    )
GROUP BY
    employee.employeeNumber
ORDER BY
    total_cust DESC
LIMIT 1;
```

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!

```sql
WITH StaffCustomers AS (
    SELECT
        employee.reportsTo AS managerID,
        COUNT(cust.customerNumber) AS direct_cust
    FROM
        employees AS employee
    LEFT JOIN
        customers AS cust ON employee.employeeNumber = cust.salesRepEmployeeNumber
    GROUP BY
        employee.reportsTo
),

ManagerCustomers AS (
    SELECT
        employee.employeeNumber AS id_manager,
        COUNT(cust.customerNumber) AS manager_cust
    FROM
        employees AS employee
    LEFT JOIN
        customers AS cust ON employee.employeeNumber = cust.salesRepEmployeeNumber
    GROUP BY
        employee.employeeNumber
)

SELECT
    m.employeeNumber AS id_manager,
    CONCAT(m.firstName, ' ', m.lastName) AS Manager,
    COALESCE(mc.manager_cust, 0) + COALESCE(sc.direct_cust, 0) AS total_kpi
FROM
    employees m
LEFT JOIN
    ManagerCustomers mc ON m.employeeNumber = mc.id_manager
LEFT JOIN
    StaffCustomers sc ON m.employeeNumber = sc.managerID
ORDER BY
    total_kpi DESC;
```

id_manager	Manager	total_kpi
1102	Gerard Bondur	46
1143	Anthony Bow	39
1088	William Patterson	10
1401	Pamela Castillo	10
1504	Barry Jones	9
1323	George Vanauf	8
1501	Larry Bott	8
1288	Foon Yue Tseng	7
1370	Gerard Hernandez	7
1165	Leslie Jennings	6
1166	Leslie Thompson	6
1188	Julie Firrelli	6
1216	Steve Patterson	6
1337	Loui Bondur	6
1702	Martin Gerard	6
1056	Mary Patterson	5
1611	Andy Fixter	5
1612	Peter Marsh	5
1621	Mami Nishi	5
1002	Diane Murphy	0
1076	Jeff Firrelli	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!

```sql
SELECT
    e.employeeNumber AS id_staff,
    CONCAT(e.firstName, ' ', e.lastName) AS staff,
    SUM(od.quantityOrdered * od.priceEach) AS total_omset
FROM
    employees AS e
LEFT JOIN
    customers AS c ON e.employeeNumber = c.salesRepEmployeeNumber
LEFT JOIN
    orders AS o ON c.customerNumber = o.customerNumber
LEFT JOIN
    orderdetails AS od ON o.orderNumber = od.orderNumber
GROUP BY
    e.employeeNumber
ORDER BY
    total_omset DESC;
```

id_staff	staff	total_omset
1370	Gerard Hernandez	1258577.81
1165	Leslie Jennings	1081530.54
1401	Pamela Castillo	868220.55
1501	Larry Bott	732096.79
1504	Barry Jones	704853.91
1323	George Vanauf	669377.05
1612	Peter Marsh	584593.76
1337	Loui Bondur	569485.75
1611	Andy Fixter	562582.59
1216	Steve Patterson	505875.42
1286	Foon Yue Tseng	488212.67
1621	Mami Nishi	457110.07
1702	Martin Gerard	387477.47
1188	Julie Firrelli	386663.20
1166	Leslie Thompson	347533.03
1002	Diane Murphy	NULL
1056	Mary Patterson	NULL
1076	Jeff Firrelli	NULL
1088	William Patterson	NULL
1102	Gerard Bondur	NULL
1143	Anthony Bow	NULL
1619	Tom King	NULL
1625	Yoshimi Kato	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	Jumlah field	Deskripsi
Jumlah customer yang bertransaksi	1	Kolom ‘customerNumber’ pada table ‘customers’
Jumlah omset yang didapat	2	Kolom ‘quantityOrdered’ dan ‘priceEach’ pada table ‘orderdetails’

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

Nama	2003	2004	2005
Foon Yue Tseng	120,000	135,000	140,000
Pamela Castillo	110,000	145,000	130,000

```sql
SELECT
    CONCAT(e.firstName, ' ', e.lastName) AS staff,
    YEAR(o.orderDate) AS tahun,
    SUM(od.quantityOrdered * od.priceEach) AS total_omset
FROM
    employees AS e
LEFT JOIN
    customers AS c ON e.employeeNumber = c.salesRepEmployeeNumber
LEFT JOIN
    orders AS o ON c.customerNumber = o.customerNumber
LEFT JOIN
    orderdetails AS od ON o.orderNumber = od.orderNumber
WHERE
    CONCAT(e.firstName, ' ', e.lastName) IN ('Foon Yue Tseng', 'Pamela Castillo')
GROUP BY
    e.employeeNumber, YEAR(o.orderDate)
ORDER BY
    staff, tahun;
```

staff	tahun	total_omset
Foon Yue Tseng	NULL	NULL
Foon Yue Tseng	2003	221887.03
Foon Yue Tseng	2004	237255.26
Foon Yue Tseng	2005	29070.38
Pamela Castillo	2003	317104.78
Pamela Castillo	2004	409910.07
Pamela Castillo	2005	141205.70

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. Hasil report yang diinginkan adalah grafik berdasarkan tabel berikut:

Nama cabang	2003	2004	2005
New York	150,000	200,000	170,000
San Francisco	100,000	140,000	180,000
Tokyo	180,000	210,000	190,000

Analisalah terlebih dahulu:

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

Field	Table	Deskripsi
officeCode	offices	Kode cabang
city	offices	Nama cabang
orderDate	orders	Tanggal transaksi
quantityOrdered	orderdetails	Jumlah item yang dipesan
priceEach	orderdetails	Harga per item
salesRepEmployeeNumber	customers	Sales yang menangani transaksi
emplyeeNumber	employees	Kode pegawai yang melayani customer
officeCode	employees	Kode cabang pegawai

2. Bentuk query dengan memperhatikan relasi antar tabel.

```sql
SELECT
    o.city AS nama_cabang,
    YEAR(ord.orderDate) AS tahun,
    SUM(od.quantityOrdered * od.priceEach) AS total_omset
FROM
    offices o
JOIN
    employees e ON o.officeCode = e.officeCode
JOIN
    customers c ON e.employeeNumber = c.salesRepEmployeeNumber
JOIN
    orders ord ON c.customerNumber = ord.customerNumber
JOIN
    orderdetails od ON ord.orderNumber = od.orderNumber
GROUP BY
    o.city, YEAR(ord.orderDate)
ORDER BY
    o.city, tahun;
```

nama_cabang	tahun ▲ 2	total_omset
Boston	2003	301781.38
Boston	2004	467177.07
Boston	2005	123580.17
London	2003	549551.94
London	2004	706014.52
London	2005	181384.24
NYC	2003	391175.53
NYC	2004	665317.99
NYC	2005	101096.20
Paris	2003	969959.90
Paris	2004	1465229.84
Paris	2005	648571.84
San Francisco	2003	532681.13
San Francisco	2004	517408.62
San Francisco	2005	378973.82
Sydney	2003	304949.11
Sydney	2004	542996.02
Sydney	2005	299231.22
Tokyo	2003	267249.40
Tokyo	2004	151761.45
Tokyo	2005	38099.22

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

Product	2003	2004	2005
1969 Harley Davidson	500.000	600.000	700.000
1940 Ford Pickup Truck	450.000	520.000	560.000
1957 Chevy Pickup	480.000	510.000	600.000

```sql
SELECT
    p.productName AS produk,
    YEAR(o.orderDate) AS tahun,
    SUM(od.quantityOrdered * od.priceEach) AS total_omset
FROM
    products p
JOIN
    orderdetails od ON p.productCode = od.productCode
JOIN
    orders o ON od.orderNumber = o.orderNumber
GROUP BY
    p.productName, YEAR(o.orderDate)
ORDER BY
    total_omset DESC;

```

produk	tahun	total_omset 1
1992 Ferrari 360 Spider red	2004	120381.40
2001 Ferrari Enzo	2004	105487.46
1992 Ferrari 360 Spider red	2003	103480.30
1952 Alpine Renault 1300	2004	87995.42
2003 Harley-Davidson Eagle Drag Bike	2004	81636.19
1980s Black Hawk Helicopter	2004	80076.41
1969 Ford Falcon	2004	76546.51
1968 Ford Mustang	2004	73369.72
1998 Chrysler Plymouth Prowler	2004	69240.97
1952 Alpine Renault 1300	2003	67985.34
2002 Suzuki XREO	2004	64972.96
1962 LanciaA Delta 16V	2004	64642.73
1957 Corvette Convertible	2004	62987.27
1969 Corvair Monza	2004	62422.14
1976 Ford Gran Torino	2004	60212.55
1970 Triumph Spitfire	2004	60031.06
1928 Mercedes-Benz SSK	2004	59979.29
2001 Ferrari Enzo	2003	59852.24
1917 Grand Touring Sedan	2004	58143.40
1972 Alfa Romeo GTA	2004	57600.08
1969 Ford Falcon	2003	57403.47
1968 Ford Mustang	2003	56462.25
ATA: B757-300	2004	56357.28
1903 Ford Model A	2004	56021.34
18th century schooner	2004	55492.20