

DATA WAREHOUSE

Jobsheet 2 - Database Operasional

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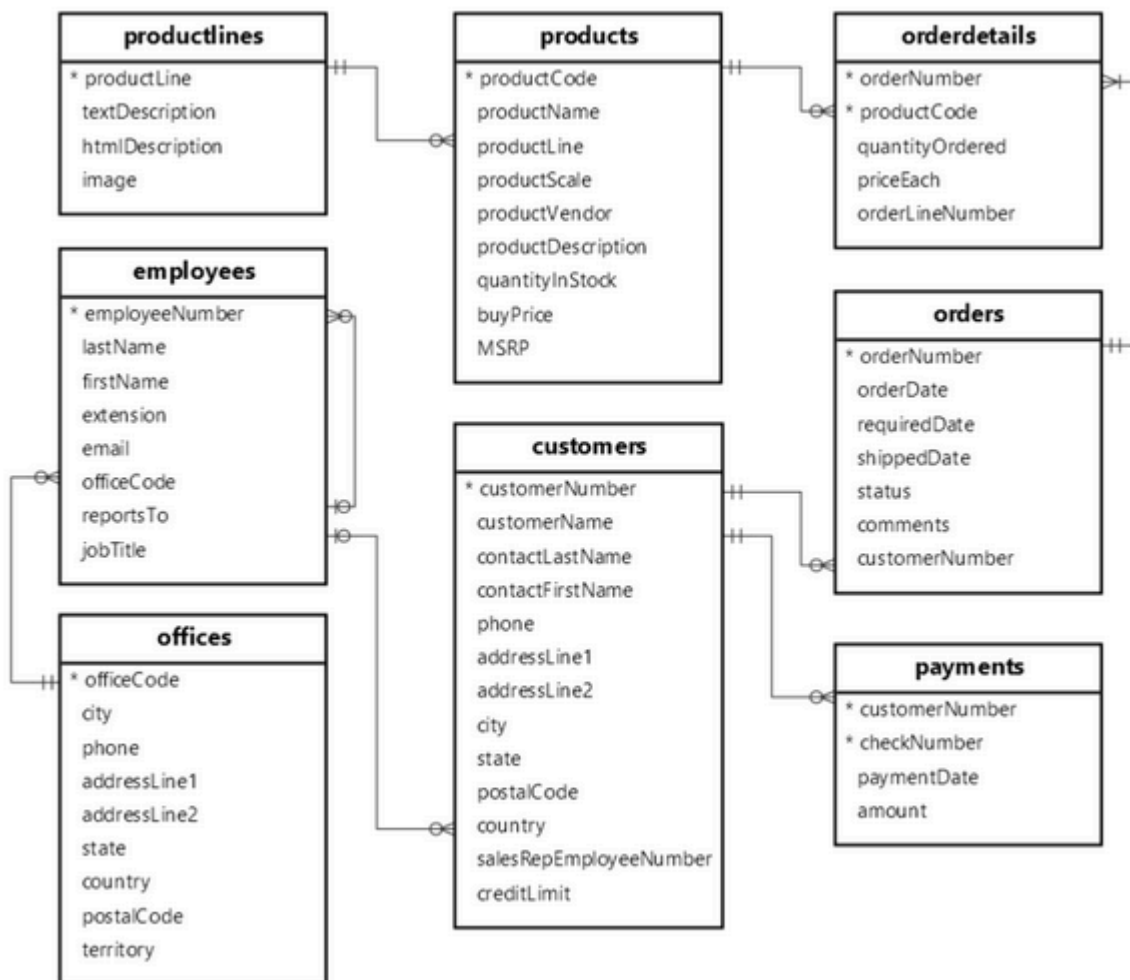
Jurusan Teknologi Informasi
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Tujuan Praktikum

Setelah melakukan praktikum ini, mahasiswa diharapkan 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 perusahaan 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!

✔ Import has been successfully finished, 26 queries executed. (mysqlsampledatabase.zip)

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
products	orderdetails	one to many
orderdetails	orders	one to many
offices	employees	one to many
employees	customers	one to many
customers	payment	one to many
customers	orders	one to many

3. Analisa jumlah field pada setiap tabel!

Nama Tabel	Jumlah Field
customers	13
employees	8
offices	9
orderdetails	5
orders	7

payment	4
productlines	4
products	9

A. ANALISA DATA

PERINGATAN: jika menemukan "ERROR" maka, Beranilah untuk menemukan dimana letak kesalahan untuk memberikan solusi. Jangan hanya bisa menyalahkan namun, tidak dapat memberikan solusinya.

Praktikum 1

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

SELECT *

FROM employees employe, employees 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.

SELECT

```

employee.employeeNumber AS emp_id,
employee.firstName AS emp_firstname,
employee.lastName AS emp_lastname,
manager.employeeNumber AS manager_id,
manager.firstName AS manager_firstname,
manager.lastName AS manager_lastname,
cust.customerNumber AS customer_id,
cust.customerName AS customer_name

```

FROM employees employe

INNER JOIN employees manager ON employe.reportsTo = manager.employeeNumber

INNER JOIN customers cust ON employe.employeeNumber = cust.salesRepEmployeeNumber

ORDER BY emp_id;

emp_id	emp_firstname	emp_lastname	manager_id	manager_firstname	manager_lastname	customer_id	customer_name
1165	Leslie	Jennings	1143	Anthony	Bow	321	Corporate Gift Ideas Co.
1165	Leslie	Jennings	1143	Anthony	Bow	124	Mini Gifts Distributors Ltd.
1165	Leslie	Jennings	1143	Anthony	Bow	450	The Sharp Gifts Warehouse
1165	Leslie	Jennings	1143	Anthony	Bow	129	Mini Wheels Co.
1165	Leslie	Jennings	1143	Anthony	Bow	161	Technics Stores Inc.
1165	Leslie	Jennings	1143	Anthony	Bow	487	Signal Collectibles Ltd.
1166	Leslie	Thompson	1143	Anthony	Bow	112	Signal Gift Stores
1166	Leslie	Thompson	1143	Anthony	Bow	475	West Coast Collectables Co.
1166	Leslie	Thompson	1143	Anthony	Bow	347	Men 'R' US Retailers, Ltd.
1166	Leslie	Thompson	1143	Anthony	Bow	219	Boards & Toys Co.
1166	Leslie	Thompson	1143	Anthony	Bow	205	Toys4GrownUps.com
1166	Leslie	Thompson	1143	Anthony	Bow	239	Collectable Mini Designs Co.
1188	Julie	Firrelli	1143	Anthony	Bow	204	Online Mini Collectables
1188	Julie	Firrelli	1143	Anthony	Bow	379	Collectables For Less Inc.
1188	Julie	Firrelli	1143	Anthony	Bow	320	Mini Creations Ltd.
1188	Julie	Firrelli	1143	Anthony	Bow	339	Classic Gift Ideas, Inc
1188	Julie	Firrelli	1143	Anthony	Bow	173	Cambridge Collectables Co.
1188	Julie	Firrelli	1143	Anthony	Bow	495	Diecast Collectables
1216	Steve	Patterson	1143	Anthony	Bow	198	Auto-Moto Classics Inc.
1216	Steve	Patterson	1143	Anthony	Bow	363	Online Diecast Creations Co.
1216	Steve	Patterson	1143	Anthony	Bow	362	Gifts4AllAges.com
1216	Steve	Patterson	1143	Anthony	Bow	157	Diecast Classics Inc.
1216	Steve	Patterson	1143	Anthony	Bow	286	Marta's Replicas Co.
1216	Steve	Patterson	1143	Anthony	Bow	462	FunGiftIdeas.com
1286	Foon Yue	Tseng	1143	Anthony	Bow	151	Muscle Machine Inc

- 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;
```

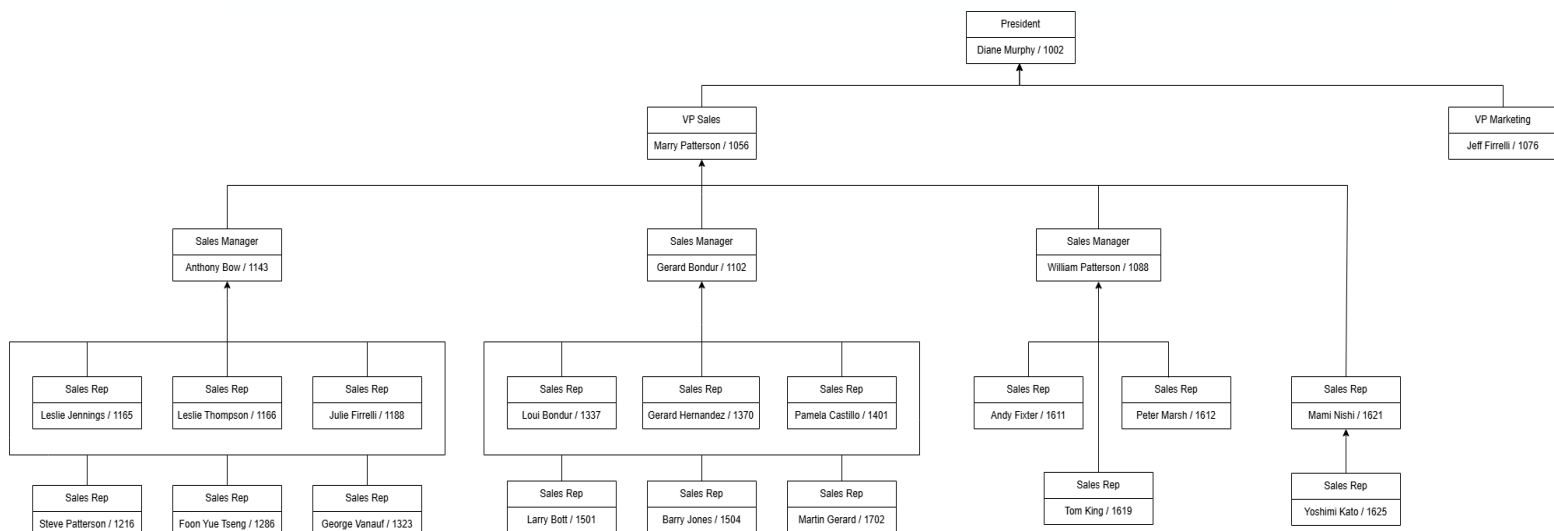
dari hasil query diatas maka akan ditemukan atasan dari setiap pegawai.

```
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
JOIN employees manager ON 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 praktikum 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(DISTINCT 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  
    manager.employeeNumber, manager.firstName, manager.lastName,  
    employee.employeeNumber, employee.firstName, employee.lastName  
ORDER BY manager.firstName;
```

dari query tersebut menghasilkan jumlah customer dari setiap staff.

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

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?

Jawab:

Pamela Castillo dengan jumlah customer 10 orang

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!

Jawab:


```

SELECT
    m.employeeNumber AS id_manager,
    CONCAT(m.firstName, ' ', m.lastName) AS manager_name,
    COUNT(c.customerNumber) AS total_customers
FROM employees m
LEFT JOIN employees e ON m.employeeNumber = e.reportsTo
LEFT JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
WHERE m.employeeNumber IN (1143, 1102, 1056)
GROUP BY m.employeeNumber, manager_name
ORDER BY `total_customers` DESC

```

id_manager	manager_name	total_customers
1102	Gerard Bondur	46
1143	Anthony Bow	39
1056	Mary Patterson	5

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

Jawab:

```

SELECT
    e.employeeNumber AS id_employee,
    CONCAT(e.firstName, ' ', e.lastName) AS employee_name,
    SUM(od.quantityOrdered * od.priceEach) AS total_revenue
FROM employees e
LEFT JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
LEFT JOIN orders o ON c.customerNumber = o.customerNumber
LEFT JOIN orderdetails od ON o.orderNumber = od.orderNumber
WHERE o.status = 'Shipped'
GROUP BY e.employeeNumber, employee_name
ORDER BY total_revenue DESC;

```

id_employee	employee_name	total_revenue
1370	Gerard Hernandez	1065035.29
1165	Leslie Jennings	1021661.89
1401	Pamela Castillo	790297.44
1501	Larry Bott	686653.25
1504	Barry Jones	637672.65
1323	George Vanauf	584406.80
1337	Loui Bondur	569485.75
1612	Peter Marsh	523860.78
1611	Andy Fixter	509385.82
1286	Foon Yue Tseng	488212.67
1621	Mami Nishi	457110.07
1216	Steve Patterson	449219.13
1702	Martin Gerard	387477.47
1188	Julie Firrelli	386663.20
1166	Leslie Thompson	307952.43

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
Jumlah customer yang bertransaksi	2 (employeeNumber, COUNT(customerNumber))
Jumlah omset yang didapat	3 (employeeNumber, SUM(quantityOrdered * priceEach), orderStatus))

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

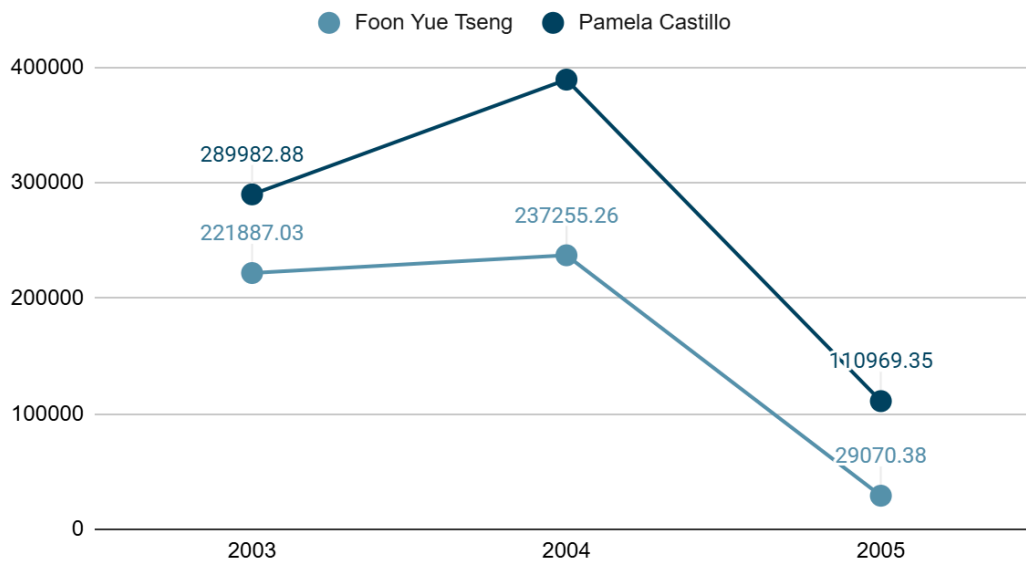
Jawab:

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

employee_name	1	tahun	2	total_revenue
Foon Yue Tseng		2003		221887.03
Foon Yue Tseng		2004		237255.26
Foon Yue Tseng		2005		29070.38
Pamela Castillo		2003		289982.88
Pamela Castillo		2004		389345.21
Pamela Castillo		2005		110969.35

Nama	2003	2004	2005
Foon Yue Tseng	221887.03	237255.26	29070.38
Pamela Castillo	289982.88	389345.21	110969.35

Poin yang diperoleh



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 melalui OLTP yang ada.

Hasil report yang diinginkan adalah grafik berdasarkan tabel berikut:

Nama Cabang	2003	2004	2005

Analisalah terlebih dahulu:

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

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.

Jawab:

Untuk menampilkan laporan ini, kita perlu field berikut:

1. **Cabang (Branch Name)** → Bisa diambil dari tabel **offices**.
2. **Tahun Penjualan** → Bisa diambil dari **orderDate** pada tabel **orders**.
3. **Total Omset** → Dihitung dari **jumlah produk terjual × harga satuan** di tabel **orderdetails**

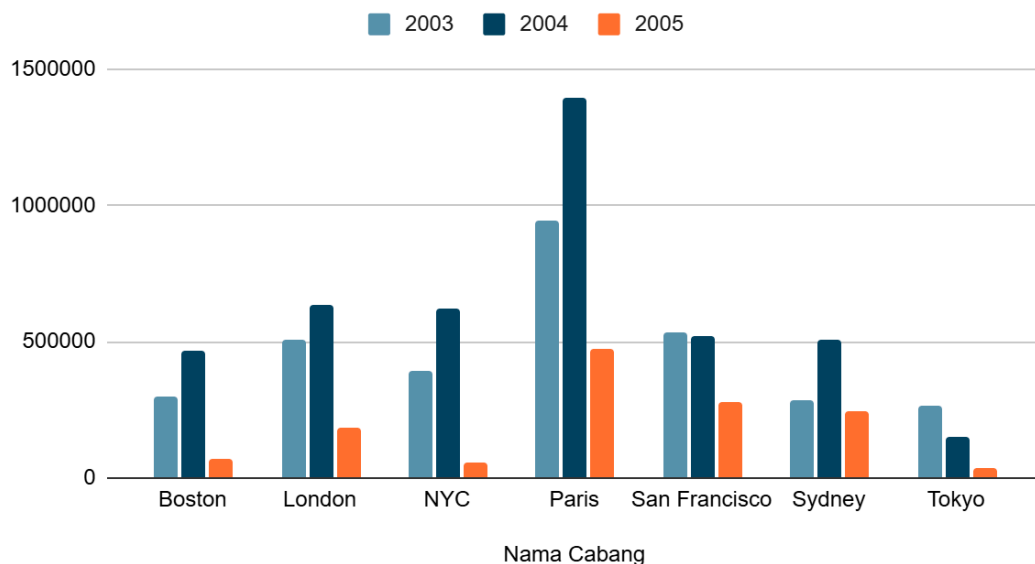
```
SELECT
  o.city AS nama_cabang,
  YEAR(ord.orderDate) AS tahun,
  SUM(od.quantityOrdered * od.priceEach) AS total_omset
FROM offices o
JOIN employees e ON o.officeCode = e.officeCode
JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
JOIN orders ord ON c.customerNumber = ord.customerNumber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

nama_cabang	tahun	total_omset
Boston	2003	301781.38
Boston	2004	467177.07
Boston	2005	66923.88
London	2003	505384.85
London	2004	637556.81
London	2005	181384.24
NYC	2003	391175.53
NYC	2004	623872.78
NYC	2005	57571.16
Paris	2003	942838.00
Paris	2004	1397599.62
Paris	2005	471858.33
San Francisco	2003	532681.13
San Francisco	2004	517408.62
San Francisco	2005	279524.57
Sydney	2003	281985.51
Sydney	2004	505226.64
Sydney	2005	246034.45
Tokyo	2003	267249.40
Tokyo	2004	151761.45
Tokyo	2005	38099.22

Nama Cabang	2003	2004	2005
Boston	301781.38	467177.07	66923.88
London	505384.85	637556.81	181384.24
NYC	391175.53	623872.78	57571.16
Paris	942838.00	1397599.62	471858.33

San Francisco	532681.13	517408.62	279524.57
Sydney	281985.51	505226.64	246034.45
Tokyo	267249.40	151761.45	38099.22

Perbandingan omset percabang



Tugas Bonus

Laporan: Rata-rata Waktu Pengiriman per Cabang

Field yang diperlukan:

1. Cabang (`offices.city`)
2. Tahun (`YEAR(orders.orderDate)`)
3. Rata-rata waktu pengiriman (`DATEDIFF(orders.shippedDate, orders.orderDate)`)

```
SELECT
    o.city AS nama_cabang,
    YEAR(ord.orderDate) AS tahun,
    AVG(DATEDIFF(ord.shippedDate, ord.orderDate)) AS rata_rata_waktu_pengiriman
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
WHERE ord.status = 'Shipped'
GROUP BY o.city, tahun
ORDER BY o.city, tahun;
```

nama_cabang	tahun	rata_rata_waktu_pengiriman
Boston	2003	4.0000
Boston	2004	3.7778
Boston	2005	4.6667
London	2003	3.2941
London	2004	3.5000
London	2005	4.2000
NYC	2003	3.2857
NYC	2004	3.8095
NYC	2005	4.5000
Paris	2003	3.6061
Paris	2004	3.4255
Paris	2005	3.0000
San Francisco	2003	4.3529
San Francisco	2004	2.7647
San Francisco	2005	3.1818
Sydney	2003	4.3636
Sydney	2004	2.8571
Sydney	2005	2.8889
Tokyo	2003	12.1429
Tokyo	2004	6.0000
Tokyo	2005	3.6667

perbandingan waktu pengiriman

