LAPORAN PRAKTIKUM DATA WAREHOUSE
JOBSHEET 2: DATABASE OPERASIONAL

Disusun Oleh:

Maharani Wirawan (2341760111)

SIB 2B

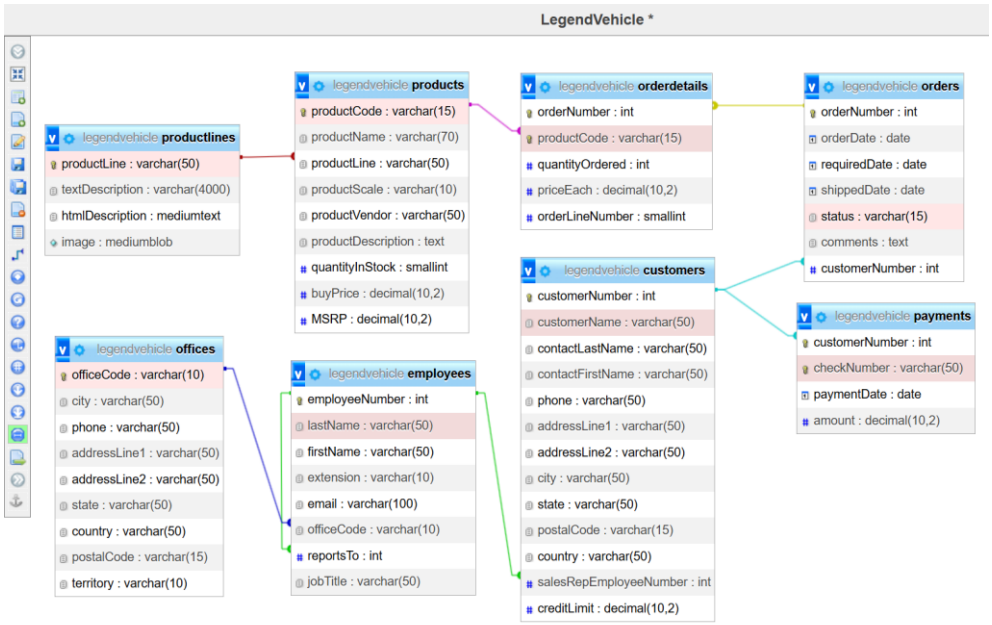
SISTEM INFORMASI BISNIS

JURUSAN TEKNOLOGI INFORMASI

POLITEKNIK NEGERI MALANG

2025

TUGAS 1



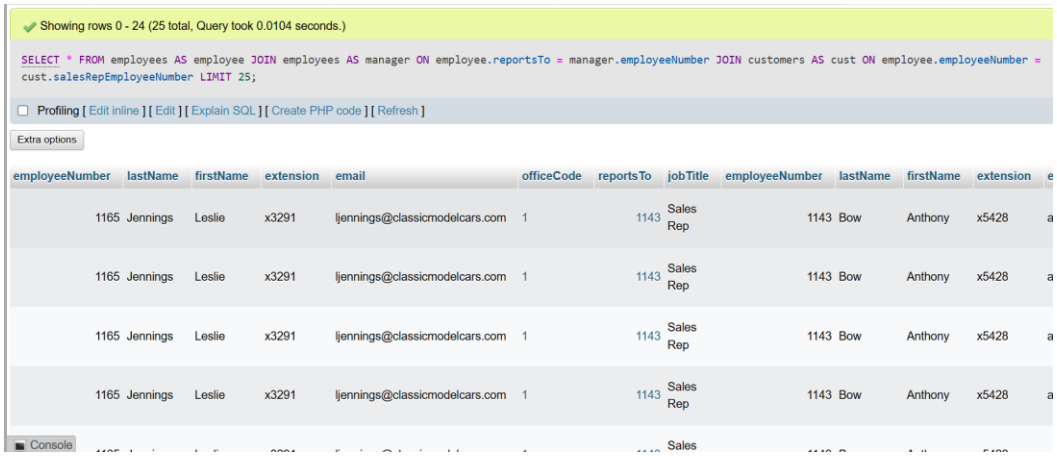
Analisa struktur data dari database perusahaan tersebut, dalam bentuk tabel, analisa hubungan setiap tabel nya!

Tabel 1	Tabel 2	Jenis Relasi
productlines	products	One to many
products	orderdetails	One to many
orders	orderdetails	One to many
orders	customers	Many to one
employees	offices	Many to one
employees	orders	One to many
customers	payments	One to many

Analisa jumlah field pada setiap tabel!

Nama Tabel	Jumlah Field
productlines	4
products	9
orderdetails	5
orders	7
employees	7
customers	6
offices	7
payments	4

PRAKTIKUM 1



Showing rows 0 - 24 (25 total, Query took 0.0104 seconds.)

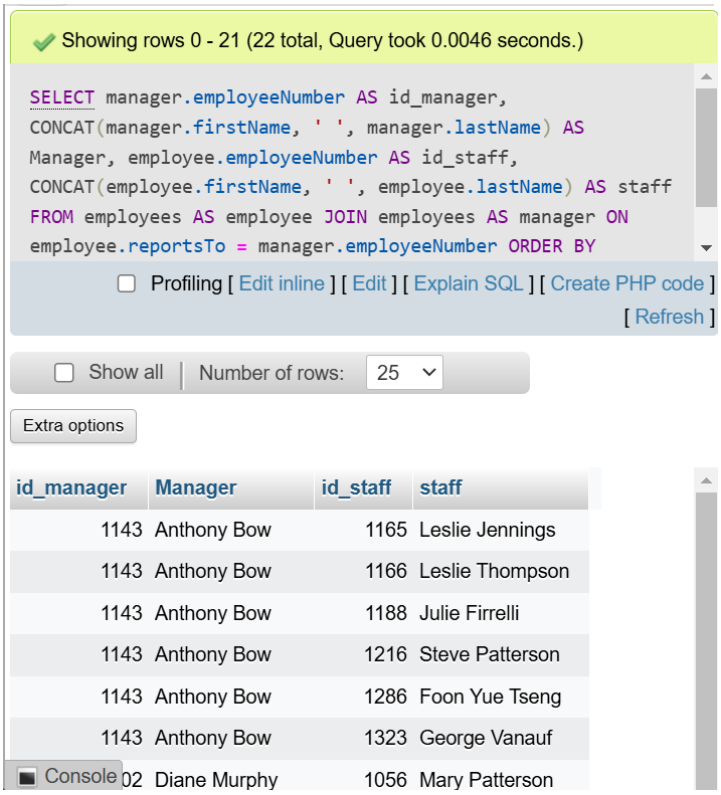
```
SELECT * FROM employees AS employee JOIN employees AS manager ON employee.reportsTo = manager.employeeNumber JOIN customers AS cust ON employee.employeeNumber =
cust.salesRepEmployeeNumber LIMIT 25;
```

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

Extra options

employeeNumber	lastName	firstName	extension	email	officeCode	reportsTo	jobTitle	employeeNumber	lastName	firstName	extension	e
1165	Jennings	Leslie	x3291	ljennings@classicmodelcars.com	1	1143	Sales Rep	1143	Bow	Anthony	x5428	a
1165	Jennings	Leslie	x3291	ljennings@classicmodelcars.com	1	1143	Sales Rep	1143	Bow	Anthony	x5428	a
1165	Jennings	Leslie	x3291	ljennings@classicmodelcars.com	1	1143	Sales Rep	1143	Bow	Anthony	x5428	a
1165	Jennings	Leslie	x3291	ljennings@classicmodelcars.com	1	1143	Sales Rep	1143	Bow	Anthony	x5428	a

Console



Showing rows 0 - 21 (22 total, Query took 0.0046 seconds.)

```
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 AS employee JOIN employees AS manager ON
employee.reportsTo = manager.employeeNumber ORDER BY
```

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

Show all | Number of rows: 25

Extra options

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
1102	Diane Murphy	1056	Mary Patterson

Console

TUGAS 2

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?

   Jawaban: Berdasarkan data yang tersedia, kita bisa mencari staff dengan **total_cust tertinggi** di antara yang tidak memiliki bawahan.

   Dari data di atas, kita melihat bahwa **staff dengan jumlah customer terbanyak (tanpa bawahan) adalah "Pamela Castillo" (total 10 customer).**

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!

   Jawaban:

```sql
WITH RECURSIVE EmployeeHierarchy AS (
    -- Ambil jumlah customer langsung untuk setiap pegawai
    SELECT
        e.employeeNumber,
        e.reportsTo,
        COUNT(c.customerNumber) AS total_cust
    FROM employees e
    LEFT JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
    GROUP BY e.employeeNumber, e.reportsTo

    UNION ALL

    -- Tambahkan jumlah customer dari bawahan
    SELECT
        eh.employeeNumber,
        e.reportsTo,
        eh.total_cust
    FROM employees e
    JOIN EmployeeHierarchy eh ON e.employeeNumber = eh.reportsTo
)
SELECT
    e.employeeNumber AS id_pegawai,
    CONCAT(e.firstName, ' ', e.lastName) AS nama_pegawai,
    e.reportsTo AS id_atasan,
    SUM(eh.total_cust) AS total_customer
FROM employees e
LEFT JOIN EmployeeHierarchy eh ON e.employeeNumber = eh.employeeNumber
GROUP BY e.employeeNumber, e.reportsTo
ORDER BY total_customer DESC;
```

id_pegawai	nama_pegawai	id_atasan	total_customer
1401	Pamela Castillo	1102	40
1504	Barry Jones	1102	36
1323	George Vanauf	1143	32
1501	Larry Bott	1102	32
1286	Foon Yue Tseng	1143	28
1370	Gerard Hernandez	1102	28
1165	Leslie Jennings	1143	24
1166	Leslie Thompson	1143	24
1188	Julie Firrelli	1143	24
1216	Steve Patterson	1143	24
1337	Loui Bondur	1102	24
1702	Martin Gerard	1102	24
1611	Andy Fixter	1088	20
1612	Peter Marsh	1088	20
1621	Mami Nishi	1056	15
1002	Diane Murphy	*NULL*	0
1056	Mary Patterson	1002	0
Console 76	Jeff Firrelli	1002	0

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

   Jawaban:

```sql
SELECT
    e.employeeNumber AS id_staff,
    CONCAT(e.firstName, ' ', e.lastName) AS staff_name,
    SUM(p.amount) AS total_sales
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
ORDER BY total_sales DESC;
```

id_staff	staff_name	total_sales ▾ 1
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
1621	Mami Nishi	457110.07
1216	Steve Patterson	449219.13
1702	Martin Gerard	387477.47
1188	Julie Firrelli	386663.20
1166	Leslie Thompson	347533.03
1002	Diane Murphy	*NULL*
1056	Mary Patterson	*NULL*
Console	eff Firrelli	*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?

   Jawaban: Untuk mendapatkan informasi **jumlah customer yang bertransaksi** dan **jumlah omzet yang didapat**, kita memerlukan field berikut:

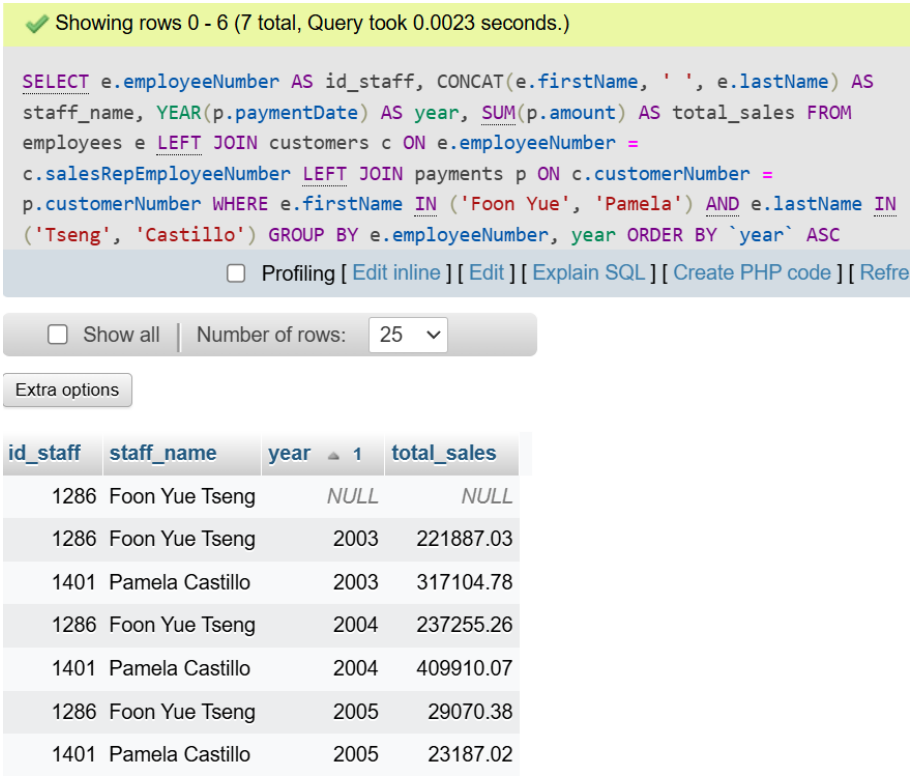
   1. **KPI Jumlah Customer**
      - `total_cust_direct` (Jumlah customer langsung yang dilayani oleh pegawai)
      - `total_cust_hierarchy` (Jumlah customer termasuk yang dari bawahannya)
   2. **KPI Jumlah Omzet**
      - `total_sales_direct` (Jumlah omzet langsung yang didapat dari customer pegawai)
      - `total_sales_hierarchy` (Jumlah omzet termasuk dari bawahannya)

Jadi, **jumlah field minimal yang dibutuhkan adalah 4 field** untuk mendapatkan informasi dari kedua KPI tersebut.

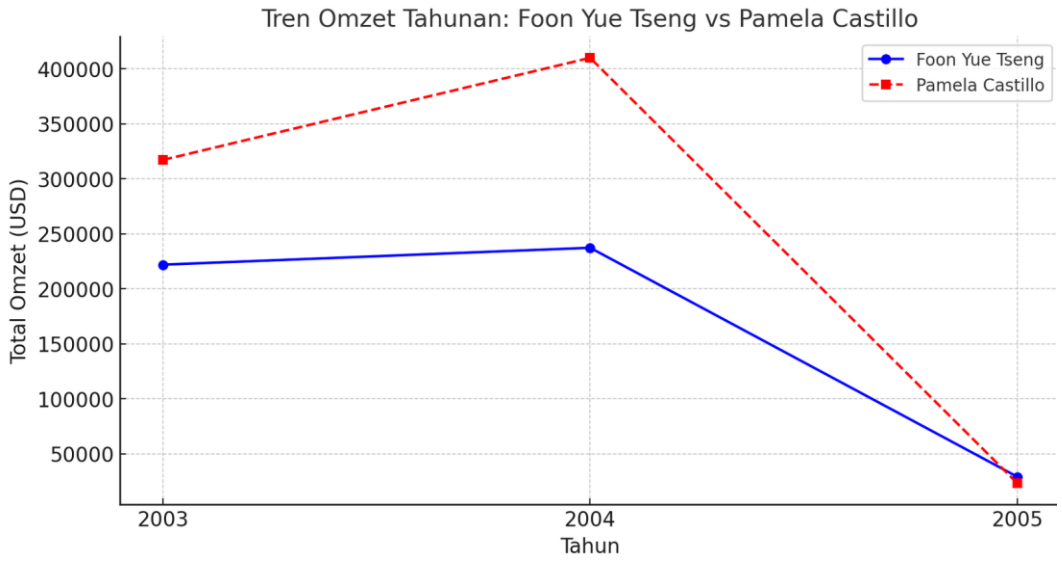
KPI	Jumlah Field
Jumlah Customer yang bertransaksi	2
Jumlah Omset yang didapat	2

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

   Jawaban:



Nama	2003	2004	2005
Foon Yue Tseng	221,887.03	237,255.26	29,070.38
Pamela Castillo	317,104.78	409,910.07	23,187.02



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:

Analisalah terlebih dahulu:

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

   Jawaban:

   Field utama yang dibutuhkan:

   1) Nama Cabang -) (branchName)
   2) Tahun Penjualan -) (YEAR(paymentDate))
   3) Total Omzet -) (SUM(amount))

   Field tambahan untuk join tabel:

   4) Kode Cabang -) (branchCode)
   5) ID Pelanggan -) (customerNumber)
   6) ID Pegawai (Sales Rep) -) (salesRepEmployeeNumber)

2. Bentuk query dengan memperhatikan relasi antar tabel.

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

branch_name	year	total_sales 2
Paris	2003	969959.90
San Francisco	2003	532681.13
London	2003	505384.85
NYC	2003	391175.53
Boston	2003	301781.38
Sydney	2003	281985.51
Tokyo	2003	267249.40
Paris	2004	1368458.96
London	2004	674815.75
NYC	2004	623872.78
San Francisco	2004	517408.62
Sydney	2004	509833.62
Boston	2004	467177.07
Tokyo	2004	151761.45
Paris	2005	480750.04
San Francisco	2005	287349.83
Sydney	2005	215473.85
London	2005	144125.30
Boston	2005	66923.88
NYC	2005	57571.16
Tokyo	2005	38099.22

Cabang	2003	2004	2005
Paris	969,959.90	1,368,458.96	480,750.04
San Francisco	532,681.13	517,408.62	287,349.83
London	505,384.85	674,815.75	144,125.30

NYC	391,175.53	623,872.78	57,571.16
Boston	301,781.38	467,177.07	66,923.88
Sydney	281,985.51	509,833.62	215,473.85
Tokyo	267,249.40	151,761.45	38,099.22

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

Hubungan antar tabel adalah:

- `offices` → `employees` (melalui `officeCode`).
- `employees` → `customers` (melalui `employeeNumber` sebagai `salesRepEmployeeNumber`).
- `customers` → `payments` (melalui `customerNumber`).

Field utama yang ditampilkan dalam hasil query:

1. `branch_name` (dari `o.city`).
2. `year` (dari `YEAR(p.paymentDate)`).
3. `total_transactions` (hasil `COUNT(p.customerNumber)`).

```sql
SELECT
    o.city AS branch_name,
    YEAR(p.paymentDate) AS year,
    COUNT(p.customerNumber) AS total_transactions
FROM offices o
JOIN employees e ON o.officeCode = e.officeCode
JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumbe
JOIN payments p ON c.customerNumber = p.customerNumber
GROUP BY o.city, YEAR(p.paymentDate)
ORDER BY YEAR(p.paymentDate), total_transactions DESC
LIMIT 25;
```

branch_name	year	total_transactions 2
Paris	2003	30
London	2003	16
San Francisco	2003	15
NYC	2003	14
Sydney	2003	11
Boston	2003	9
Tokyo	2003	5
Paris	2004	44
London	2004	22
NYC	2004	21
Boston	2004	17
San Francisco	2004	13
Sydney	2004	13
Tokyo	2004	6
Paris	2005	13
San Francisco	2005	6
Sydney	2005	6
London	2005	4
Boston	2005	3
Tokyo	2005	3
NYC	2005	2