LAPORAN HASIL PRAKTIKUM

DATA WAREHOUSE

JOBSHEET 2

Oleh:

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SIB-2B / 08

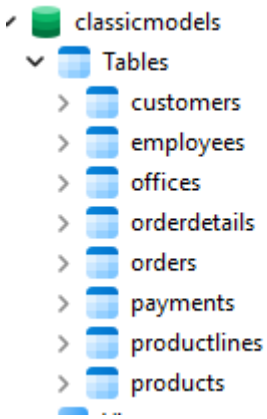
D-IV SISTEM INFORMASI BISNIS

JURUSAN TEKNOLOGI INFORMASI

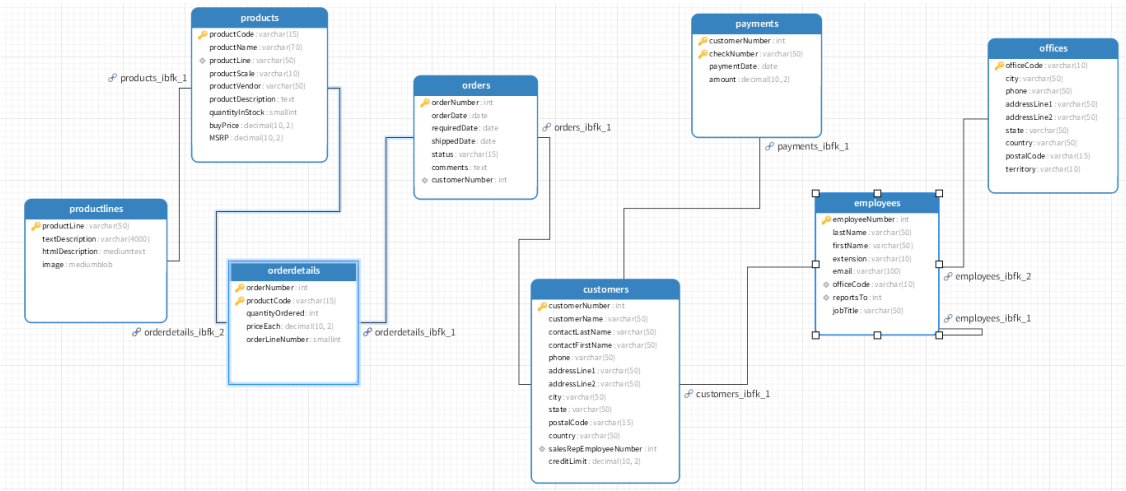
POLITEKNIK NEGERI MALANG

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 (1:N)
products	orderdetails	One-to-Many (1:N)
orders	orderdetails	One-to-Many (1:N)
customers	orders	One-to-Many (1:N)
customers	payments	One-to-Many (1:N)

employees	offices	Many-to-One (N:1)
employees	employees	Hierarchical (Self-Join)
customers	employees	Many-to-One (N:1)

3. Analisa jumlah field pasa setiap table!

Nama Tabel	Jumlah Field
productlines	4
products	8
orderdetails	4
orders	6
customers	9
payments	4
employees	7
offices	7

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.

employeeNumber	lastName	firstName	extension	email	officeCode	reportsTo	jobTitle	employeeNumber(1)	lastName(1)	firstName(1)	extension(1)	email(1)	officeCode
1165	Jennings	Leslie	x3291	ljennings@	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1
1165	Jennings	Leslie	x3291	ljennings@	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1
1165	Jennings	Leslie	x3291	ljennings@	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1
1165	Jennings	Leslie	x3291	ljennings@	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1
1165	Jennings	Leslie	x3291	ljennings@	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1
1165	Jennings	Leslie	x3291	ljennings@	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1
1166	Thompson	Leslie	x4065	lthompsor	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1
1166	Thompson	Leslie	x4065	lthompsor	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1
1166	Thompson	Leslie	x4065	lthompsor	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1
1166	Thompson	Leslie	x4065	lthompsor	1	1143	Sales Rep	1143	Bow	Anthony	x5428	abow@classicmodelcars.c	1

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;
```

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
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

TUGAS 2

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

   Hierarki Organisasi

   - **Diane Murphy (1002)**
     - **Jeff Firrelli (1076)**
     - **Mary Patterson (1056)**
       - **William Patterson (1088)**
         - **Andy Fixter (1611)**
         - **Peter Marsh (1612)**
         - **Tom King (1619)**
       - **Gerard Bondur (1102)**
         - **Loui Bondur (1337)**
         - **Gerard Hernandez (1370)**
         - **Pamela Castillo (1401)**
         - **Larry Bott (1501)**
         - **Barry Jones (1504)**
         - **Martin Gerard (1702)**
       - **Anthony Bow (1143)**
         - **Leslie Jennings (1165)**
         - **Leslie Thompson (1166)**
         - **Julie Firrelli (1188)**
         - **Steve Patterson (1216)**
         - **Foon Yue Tseng (1286)**
         - **George Vanauf (1323)**
       - **Mami Nishi (1621)**
         - **Yoshimi Kato (1625)**

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;
```

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!

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

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 nama_staff,

    COUNT(c.customerNumber) AS total_customer

FROM employees e

LEFT JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber

WHERE e.employeeNumber NOT IN (SELECT DISTINCT reportsTo FROM employees WHERE reportsTo IS NOT
NULL)

GROUP BY e.employeeNumber

ORDER BY total_customer DESC

LIMIT 1;
```

id_staff	nama_staff	total_customer
1401	Pamela Castillo	10

Pamela Castillo (1401) dengan 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!**

```
SELECT
    manager.employeeNumber AS id_manager,
    CONCAT(manager.firstName, ' ', manager.lastName) AS nama_manager,
    COUNT(DISTINCT cust.customerNumber) AS total_customer_direct,
    COALESCE(SUM(subordinate.total_customer), 0) AS total_customer_bawahan,
    (COUNT(DISTINCT cust.customerNumber) + COALESCE(SUM(subordinate.total_customer), 0)) AS
total_kpi
FROM employees manager
LEFT JOIN employees employee ON manager.employeeNumber = employee.reportsTo
LEFT JOIN customers cust ON manager.employeeNumber = cust.salesRepEmployeeNumber
LEFT JOIN (
    SELECT e.reportsTo, COUNT(c.customerNumber) AS total_customer
    FROM employees e
    LEFT JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
    GROUP BY e.reportsTo
) subordinate ON manager.employeeNumber = subordinate.reportsTo
GROUP BY manager.employeeNumber
ORDER BY total_kpi DESC;
```

id_manager	nama_manager	total_customer_direct	total_customer_bawah	total_kpi
1102	Gerard Bondur	0	276	276
1143	Anthony Bow	0	234	234
1088	William Patterson	0	30	30
1056	Mary Patterson	0	20	20
1401	Pamela Castillo	10	0	10
1504	Barry Jones	9	0	9
1323	George Vanauf	8	0	8
1501	Larry Bott	8	0	8
1286	Foon Yue Tseng	7	0	7
1370	Gerard Hernandez	7	0	7
1165	Leslie Jennings	6	0	6
1166	Leslie Thompson	6	0	6
1188	Julie Firrelli	6	0	6
1216	Steve Patterson	6	0	6
1337	Loui Bondur	6	0	6
1702	Martin Gerard	6	0	6
1611	Andy Fixter	5	0	5
1612	Peter Marsh	5	0	5
1621	Mami Nishi	5	0	5
1002	Diane Murphy	0	0	0
1076	Jeff Firrelli	0	0	0
1619	Tom King	0	0	0
1625	Yoshimi Kato	0	0	0

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

```
SELECT
    e.employeeNumber AS id_pegawai,
    CONCAT(e.firstName, ' ', e.lastName) AS nama_pegawai,
    COALESCE(SUM(p.amount), 0) AS total_omset
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_omset DESC;
```

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
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	0,00
1056	Mary Patterson	0,00
1076	Jeff Firrelli	0,00
1088	William Patterson	0,00
1102	Gerard Bondur	0,00
1143	Anthony Bow	0,00
1619	Tom King	0,00
1625	Yoshimi Kato	0,00

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?**

```
SELECT
    e.employeeNumber,
    CONCAT(e.firstName, ' ', e.lastName) AS employeeName,
    COUNT(DISTINCT c.customerNumber) AS total_customers,
    SUM(p.amount) AS total_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
ORDER BY total_revenue DESC;
```

employeeNumber	employeeName	total_customers	total_revenue
1370	Gerard Hernandez	7	1112003,81
1165	Leslie Jennings	6	989906,55
1401	Pamela Castillo	10	750201,87
1501	Larry Bott	8	686653,25

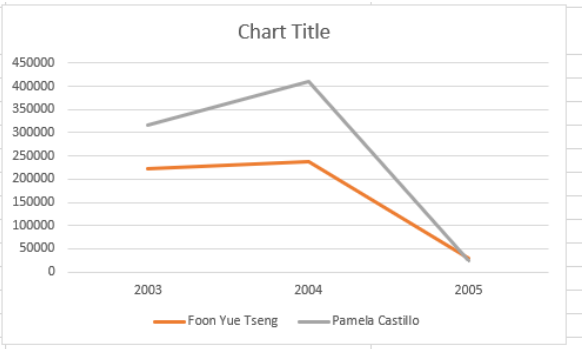
KPI	Jumlah Field
Jumlah customer yang bertransaksi	**1** (COUNT DISTINCT customerNumber)
Jumlah omset yang didapat	**1** (SUM(amount))

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

```
SELECT
    e.employeeNumber,
    CONCAT(e.firstName, ' ', e.lastName) AS employeeName,
    YEAR(p.paymentDate) AS tahun,
    SUM(p.amount) AS total_revenue
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, YEAR(p.paymentDate)
ORDER BY tahun, total_revenue DESC;
```

employeeNumber	employeeName	tahun	total_revenue
1401	Pamela Castillo	2003	317104,78
1286	Foon Yue Tseng	2003	221887,03
1401	Pamela Castillo	2004	409910,07
1286	Foon Yue Tseng	2004	237255,26
1286	Foon Yue Tseng	2005	29070,38
1401	Pamela Castillo	2005	23187,02

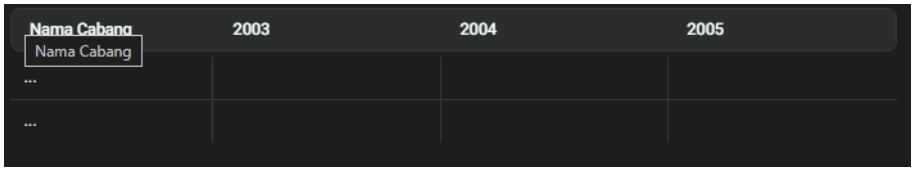
Tahun	Foon Yue Tseng	Pamela Castillo
2003	221887,03	317104,78
2004	237255,26	409910,07
2005	29070,38	23187,02



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.

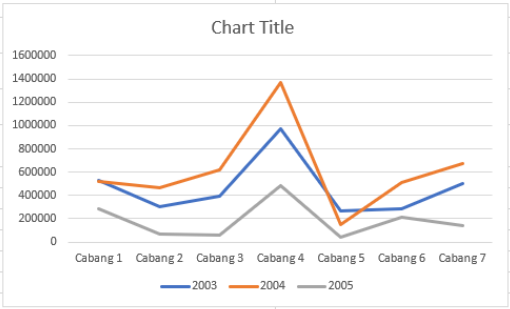
Nama Field	Asal Tabel	Keterangan
officeCode	offices	Kode unik cabang
city	offices	Nama cabang/kota
paymentDate	payments	Tanggal pembayaran
amount	payments	Total transaksi
customerNumber	customers	ID pelanggan
salesRepEmployeeNumber	customers	ID sales representative
employeeNumber	employees	ID karyawan/sales
officeCode	employees	Cabang tempat sales bekerja

2. Bentuk query dengan memperhatikan relasi antar tabel.

```
SELECT
    b.officeCode AS 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 b ON e.officeCode = b.officeCode
GROUP BY b.officeCode, YEAR(p.paymentDate)
ORDER BY tahun, cabang;
```

cabang	tahun	total_omset
1	2003	532681,13
2	2003	301781,38
3	2003	391175,53
4	2003	969959,90
5	2003	267249,40
6	2003	281985,51
7	2003	505384,85
1	2004	517408,62
2	2004	467177,07
3	2004	623872,78
4	2004	1368458,96
5	2004	151761,45
6	2004	509833,62
7	2004	674815,75
1	2005	287349,83
2	2005	66923,88
3	2005	57571,16
4	2005	480750,04
5	2005	38099,22
6	2005	215473,85
7	2005	144125,30

Tahun	Cabang 1	Cabang 2	Cabang 3	Cabang 4	Cabang 5	Cabang 6	Cabang 7
2003	532681,13	301781,4	391175,5	969959,9	267249,4	281985,5	505384,9
2004	517408,62	467177,1	623872,8	1368459	151761,5	509833,6	674815,8
2005	287349,83	66923,88	57571,16	480750,04	38099,22	215473,9	144125,3



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

Report Top 5 Sales dengan Omset Tertinggi

Nama Field	Asal Tabel	Keterangan
employeeNumber	employees	ID Karyawan
firstName + lastName	employees	Nama Sales
SUM(amount)	payments	Total omset yang diperoleh
YEAR(paymentDate)	payments	Tahun transaksi

```
SELECT
    e.employeeNumber,
    CONCAT(e.firstName, ' ', e.lastName) AS nama_sales,
    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
GROUP BY e.employeeNumber, nama_sales, YEAR(p.paymentDate)
ORDER BY tahun, total_omset DESC
LIMIT 5;
```

employeeNumber	nama_sales	tahun	total_omset
1165	Leslie Jennings	2003	413219,85
1401	Pamela Castillo	2003	317104,78
1370	Gerard Hernandez	2003	295246,44
1621	Mami Nishi	2003	267249,40
1501	Larry Bott	2003	261536,95

Tahun	Nama	Omset
2003	Leslie Jennings	413219,9
2003	Pamela Castillo	317104,8
2003	Gerard Hernandez	295246,4
2003	Mami Nishi	267249,4
2003	Larry Bott	261537