

Exercise 1:

The sales management database consists of the following relations

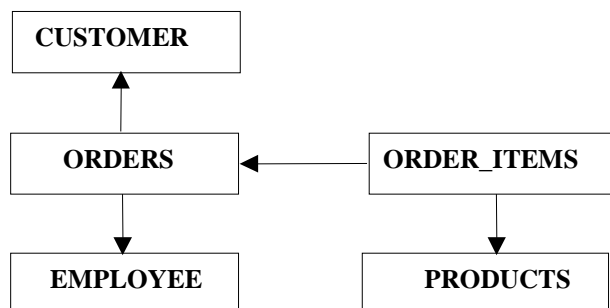
CUSTOMERS (CUST_ID, NAME, ADDRESS, PHONE, BIRTH_DATE, TOTAL_ORDER, REG_DATE)
Customer relation stores customer information including customer id, name, address, phone number, date of birth, total order of this customer and date of registration.

EMPLOYEES (EMP_ID, EMP_NAME, PHONE, HIRE_DATE)
Each employee has a unique id, a name, a phone number and a hired date.

PRODUCTS (PRO_ID, PRO_NAME, UNIT, COUNTRY, PRICE)
Each product has a unique id, a name, a unit, a country of manufacture and a selling price.

ORDERS (ORDER_ID, ORDER_DATE, CUST_ID, EMP_ID, TOTAL)
When purchasing, each customer will receive a bill, which will have the id, date of purchasing, employee id, total of order.

ORDER_ITEMS (ORDER_ID, PRO_ID, QUANTITY)



EMPLOYEES

EMP_ID	EMP_NAME	PHONE	HIRE_DATE
NV01	Nguyen Nhu Nhut	0927345678	13/4/2006
NV02	Le Thi Phi Yen	0987567390	21/4/2006
NV03	Nguyen Van B	0997047382	27/4/2006
NV04	Ngo Thanh Tuan	0913758498	24/6/2006
NV05	Nguyen Thi Truc Thanh	0918590387	20/7/2006

CUSTOMERS

CUST_ID	NAME	ADDRESS	PHONE	BIRTH_DATE	TOTAL_ORDER	REG_DATE
KH01	Nguyen Van A	731 Tran Hung Dao, Q5, TpHCM	08823451	22/10/1960	13,060,000	22/07/2006
KH02	Tran Ngoc Han	23/5 Nguyen Trai, Q5, TpHCM	0908256478	3/4/1974	280,000	30/07/2006
KH03	Tran Ngoc Linh	45 Nguyen Canh Chan, Q1, TpHCM	0938776266	12/6/1980	3,860,000	05/08/2006
KH04	Tran Minh Long	50/34 Le Dai Hanh, Q10, TpHCM	0917325476	9/3/1965	250,000	02/10/2006
KH05	Le Nhat Minh	34 Truong Dinh, Q3, TpHCM	08246108	10/3/1950	21,000	28/10/2006
KH06	Le Hoai Thuong	227 Nguyen Van Cu, Q5, TpHCM	08631738	31/12/1981	915,000	24/11/2006
KH07	Nguyen Van Tam	32/3 Tran Binh Trong, Q5, TpHCM	0916783565	6/4/1971	12,500	01/12/2006
KH08	Phan Thi Thanh	45/2 An Duong Vuong, Q5, TpHCM	0938435756	10/1/1971	365,000	13/12/2006
KH09	Le Ha Vinh	873 Le Hong Phong, Q5, TpHCM	08654763	3/9/1979	70,000	14/01/2007
KH10	Ha Duy Lap	34/34B Nguyen Trai, Q1, TpHCM	08768904	2/5/1983	67,500	16/01/2007

PRODUCTS

PRO_ID	PRO_NAME	UNIT	COUNTRY	PRICE
BC01	But chi	cay	Singapore	3,000
BC02	But chi	cay	Singapore	5,000
BC03	But chi	cay	Viet Nam	3,500
BC04	But chi	hop	Viet Nam	30,000
BB01	But bi	cay	Viet Nam	5,000
BB02	But bi	cay	Trung Quoc	7,000
BB03	But bi	hop	Thai Lan	100,000
TV01	Tap 100 giay mong	quyen	Trung Quoc	2,500
TV02	Tap 200 giay mong	quyen	Trung Quoc	4,500
TV03	Tap 100 giay tot	quyen	Viet Nam	3,000
TV04	Tap 200 giay tot	quyen	Viet Nam	5,500
TV05	Tap 100 trang	chuc	Viet Nam	23,000
TV06	Tap 200 trang	chuc	Viet Nam	53,000
TV07	Tap 100 trang	chuc	Trung Quoc	34,000
ST01	So tay 500 trang	quyen	Trung Quoc	40,000
ST02	So tay loai 1	quyen	Viet Nam	55,000
ST03	So tay loai 2	quyen	Viet Nam	51,000
ST04	So tay	quyen	Thai Lan	55,000
ST05	So tay mong	quyen	Thai Lan	20,000
ST06	Phan viet bang	hop	Viet Nam	5,000
ST07	Phan khong bui	hop	Viet Nam	7,000
ST08	Bong bang	cai	Viet Nam	1,000
ST09	But long	cay	Viet Nam	5,000
ST10	But long	cay	Trung Quoc	7,000

ORDERS

ORDE R_ID	ORDER_DA TE	CUST _ID	EMP_ ID	TOTAL
1001	23/07/2006	KH01	NV01	320,000
1002	12/08/2006	KH01	NV02	840,000
1003	23/08/2006	KH02	NV01	100,000
1004	01/09/2006	KH02	NV01	180,000
1005	20/10/2006	KH01	NV02	3,800,000
1006	16/10/2006	KH01	NV03	2,430,000
1007	28/10/2006	KH03	NV03	510,000
1008	28/10/2006	KH01	NV03	440,000
1009	28/10/2006	KH03	NV04	200,000
1010	01/11/2006	KH01	NV01	5,200,000
1011	04/11/2006	KH04	NV03	250,000
1012	30/11/2006	KH05	NV03	21,000
1013	12/12/2006	KH06	NV01	5,000
1014	31/12/2006	KH03	NV02	3,150,000
1015	01/01/2007	KH06	NV01	910,000
1016	01/01/2007	KH07	NV02	12,500
1017	02/01/2007	KH08	NV03	35,000
1018	13/01/2007	KH08	NV03	330,000
1019	13/01/2007	KH01	NV03	30,000
1020	14/01/2007	KH09	NV04	70,000
1021	16/01/2007	KH10	NV03	67,500
1022	16/01/2007	Null	NV03	7,000
1023	17/01/2007	Null	NV01	330,000

ORDER_ITEMS

ORDER_ID	PRO_ID	QUANTITY
1001	TV02	10
1001	ST01	5
1001	BC01	5
1001	BC02	10
1001	ST08	10
1002	BC04	20
1002	BB01	20
1002	BB02	20
1003	BB03	10
1004	TV01	20
1004	TV02	10
1004	TV03	10
1004	TV04	10
1005	TV05	50
1005	TV06	50
1006	TV07	20

ORDER_ITEMS

ORDER_ID	PRO_ID	QUANTITY
1006	ST01	30
1006	ST02	10
1007	ST03	10
1008	ST04	8
1009	ST05	10
1010	TV07	50
1010	ST07	50
1010	ST08	100
1010	ST04	50
1010	TV03	100
1011	ST06	50
1012	ST07	3
1013	ST08	5
1014	BC02	80
1014	BB02	100
1014	BC04	60

ORDER_ITEMS

ORDER_ID	PRO_ID	QUANTITY
1014	BB01	50
1015	BB02	30
1015	BB03	7
1016	TV01	5
1017	TV02	1
1017	TV03	1
1017	TV04	5
1018	ST04	6
1019	ST05	1
1019	ST06	2
1020	ST07	10
1021	ST08	5
1021	TV01	7
1021	TV02	10
1022	ST07	1
1023	ST04	6

ATTRIBUTE TABLE

RELATION	Attribute	Explanation	Datatype
CUSTOMERS	CUST_ID	Customer id	char(4)
	NAME	Full name of customer	varchar(40)
	ADDRESS	Address	varchar(50)
	PHONE	Phone number	varchar(20)
	BIRTH_DATE	Date of birth	smalldatetime
	TOTAL_ORDER	Total order of this customer	money
	REG_DATE	Date of registration	smalldatetime
EMPLOYEES	EMP_ID	Employee id	char(4)
	EMP_NAME	Full name of employee	varchar(40)
	PHONE	Phone number	varchar(20)
	HIRE_DATE	Hired date	smalldatetime
PRODUCTS	PRO_ID	Product id	char(4)
	PRO_NAME	Product name	varchar(40)
	UNIT	Unit of product	varchar(20)
	COUNTRY	Country of manufacture	varchar(40)
	PRICE	Selling price	money
ORDERS	ORDER_ID	Order id	int
	ORDER_DATE	Date of purchasing	smalldatetime
	CUST_ID	Customer id	char(4)
	EMP_ID	Employee id	char(4)
	TOTAL	Total of order	money
ORDER_ITEMS	ORDER_ID	Order id	int
	PRO_ID	Product id	char(4)
	QUANTITY	Selling quantity	int

I. Data Definition Language (DDL):

1. Create relations, primary keys and foreign keys.
2. Add attribute COMMENT varchar(20) to PRODUCTS table.
3. Add attribute CUST_TYPE tinyint to CUSTOMERS table.
4. Change datatype of attribute COMMENT in table PRODUCTS to varchar(100).
5. Remove attribute COMMENT from table PRODUCTS.
6. Change datatype of attribute CUST_TYPE of CUSTOMERS table so that CUST_TYPE can contain 'Vang lai', 'Thuong xuyen', 'Vip'...
7. Unit attribute of table PRODUCTS can only contain ('cay', 'hop', 'cai', 'quyen', 'chuc')
8. Price of products must be greater than 500.
9. QUANTITY of order items must be at least 1.
10. Date of registration must be greater than date of birth.

11. Date of purchasing (ORDER_DATE) of a customer must be greater than or equal to the date of registration (REG_DATE).
12. An order must have at least one order item.
13. Total of an order must be equal to the sum of its parts (Quantity * price).
14. Total order of a customer must be equal to the sum of all order of this customer.

II. Data Manipulation Language (DML):

1. Create table PRODUCT1 that copy all data FROM table PRODUCT. Create table CUSTOMER1 that copy all data FROM table CUSTOMER.
2. Update the selling prices of “Thai Lan” Products increment by 5%. (update in table PRODUCT1).
3. Update the selling prices of “Trung Quoc” Products decrement by 5%. (update in table PRODUCT1).

III. Structured Query Language (SQL):

1. Show full details of all Products.
2. Which products (PRO_ID, PRO_NAME, COUNTRY) produced by “Trung Quoc”.
3. Show the product id and product name, unit of all products that unit is “cay”, ”quyen”.
4. Show all the products (PRO_ID, PRO_NAME) that the id begins with ‘B’ and ends with ‘01’
5. Show the list of products (PRO_ID, PRO_NAME, COUNTRY, PRICE) produced by "Trung Quốc" priced between 30,000 and 40,000.
6. Show the list of products (PRO_ID, PRO_NAME, COUNTRY, PRICE) produced by "Trung Quốc" or "Thai Lan" priced between 30,000 and 40,000.
7. Show full details of all orders on ‘1/1/2007 and ‘2/1/2007’
8. Show ORDER_ID, ORDER_DATE, TOTAL of all orders in Jan 2007, sorted by ORDER_DATE (ascending) and TOTAL (descending)
9. Show CUST_ID, NAME of all customers who placed order on ‘1/1/2007’.
10. Write a query that will return the order id and total that have made by employee ‘Nguyen Van B’ on ‘28/10/2006’
11. List all the products that have bought by customer ‘Nguyen Van A’ in Oct 2006.
12. List the id, date of all the orders that contain product “BB01” or “BB02.
13. List the id, date of all the orders that contain product “BB01” or “BB02 and quantity from 10 to 20.
14. List the id, date of all the orders that contain product “BB01” **and** “BB02.
15. List the id, date of all the orders that contain product “BB01” **and** “BB02 and quantity from 10 to 20.
16. Show all the products (pro_id, pro_name) that have made by ‘Trung Quoc’ or the products that have bought on ‘1/1/2007’
17. What are the products which were not sold in 2006?
18. What are the ‘Trung Quoc’ products which were not sold in 2006?

19. Find all the orders that have bought all 'Singapore' products.
20. How many orders that have bought by non-registered customers.
21. How many difference products that have bought in 2006?
22. Show the maximum and minimum TOTAL values in orders table.
23. In 2006, show the average TOTAL values in orders table.
24. Show the sum of TOTAL of all ORDER in year 2006.
25. In 2006, which orders had maximum TOTAL.
26. Find all the customers who have the highest sum of TOTAL in 2006.
27. Find 3 customers who have the highest TOTAL_ORDER.
28. Which products are in the top 3 highest selling price.
29. Which 'Thai Lan' products are in the top 3 highest selling price.
30. Which 'Trung Quoc' products are in the top 3 highest selling price (products of 'Trung Quoc')
31. How many products are made by 'Trung Quoc'?
32. How many products are made by each country?
33. Show the maximum, minimum, average selling price of 'Singapore' products.
34. Show the maximum, minimum, average selling price of products for each country.
35. How much is the sum of TOTAL order for each day?
36. Total number of each product was sold in Oct 2006?
37. How much is the sum of TOTAL order for each month in 2006.
38. Which orders have at least 4 different products.
39. Which orders have at least 3 'Viet Nam' products (3 different products)
40. Find all customers who have the highest orders.
41. In 2006, which months had the highest sum of total.
42. Which products have the lowest total quantity in 2006
43. *Each country, find products that have the highest selling price.
44. Find all countries that make at least three products that have different selling prices.