Chapitre **8**

Le langage SQL DML (2)

Ce document reprend les requêtes SQL du chapitre 8 de l'ouvrage *Bases de données - Concepts, utilisation et développement.*

8.1 INTRODUCTION

8.2 EXTRACTION DE DONNÉES DE PLUSIEURS TABLES (JOINTURE)

```
select NCOM, CLIENT.NCLI, DATECOM, NOM, LOCALITE
from   COMMANDE, CLIENT
where  COMMANDE.NCLI = CLIENT.NCLI;

select CLIENT.NCLI, NOM, DATECOM, NPRO
from   CLIENT, COMMANDE, DETAIL
where  CLIENT.NCLI = COMMANDE.NCLI
and    COMMANDE.NCOM = DETAIL.NCOM;
```

8.2.1 Conditions de jointure et conditions de sélection

```
select NCOM, CLIENT.NCLI, DATECOM, NOM, ADRESSE
from   COMMANDE, CLIENT
where  COMMANDE.NCLI = CLIENT.NCLI
and    CAT = 'C1'
and    DATECOM < '23-12-2009';
```

8.2.2 La jointure et les lignes célibataires

```
select NCOM, CLIENT.NCLI, DATECOM, NOM, LOCALITE
from   COMMANDE, CLIENT
where  COMMANDE.NCLI = CLIENT.NCLI
union
select '--', NCLI, '--', NOM, LOCALITE
from   CLIENT
where  not exists (select * from COMMANDE
                   where NCLI = CLIENT.NCLI);
```

8.3 LES OPÉRATEURS ENSEMBLISTES

```
select LOCALITE from CLIENT where CAT = 'C1'
union
select LOCALITE from CLIENT where COMPTE < 0;
```

```
select LOCALITE from CLIENT where CAT = 'C1'
union all
select LOCALITE from CLIENT where COMPTE < 0;
```

8.4 LE PRODUIT RELATIONNEL

```
select NCOM, CLIENT.NCLI, DATECOM, NOM, ADRESSE
from   COMMANDE, CLIENT;
```

```
select distinct LOCALITE, NPRO
from   CLIENT,PRODUIT;
```

```
select distinct LOCALITE, NPRO
from   CLIENT C,COMMANDE M,DETAIL D
where  C.NCLI=M.NCLI
and    M.NCOM=D.NCOM;
```

```
select distinct LOCALITE, NPRO
from   CLIENT, PRODUIT
except
select distinct LOCALITE,NPRO
from   CLIENT C,COMMANDE M,DETAIL D
where  C.NCLI=M.NCLI
and    M.NCOM=D.NCOM;
```

8.5 REQUÊTES SUR DES STRUCTURES DE DONNÉES CYCLIQUES

```
create table PERSONNE ( NPERS       char (4) not null,
                        NOM         char(25) not null,
                        RESPONSABLE char (4),
                      primary key (NPERS),
                      foreign key (RESPONSABLE)
                              references PERSONNE);
```

```
select S.NPERS, R.NPERS, R.NOM
from   PERSONNE S, PERSONNE R
where  S.RESPONSABLE = R.NPERS;
```

```
select S.NPERS, R.NPERS, R.NOM
from   PERSONNE S, SUPERIEUR R
where  S.RESPONSABLE = R.NPERS
and    S.NOM = 'Dupont';
```

```
select S.NPERS, R.NPERS, R.NOM
from   PERSONNE S, PERSONNE R
where  S.RESPONSABLE = R.NPERS
and    S.NOM = 'Dupont'
union
select NPERS, '--', '--'
from   PERSONNE
where  RESPONSABLE is null and NOM = 'Dupont';
```

```
select R.NPERS, R.NOM, SS.NPERS, SS.NOM
from   PERSONNE R, PERSONNE S, PERSONNE SS
where  R.NPERS = 'p4'
and    R.NPERS = S.RESPONSABLE
and    S.NPERS = SS.RESPONSABLE;
```

```
select H.NPRO,H.LIBELLE,C.QTE,B.NPRO,B.LIBELLE
from   PRODUIT H, COMPOSITION C, PRODUIT B
where  C.COMPOSE = H.NPRO
and    C.COMPOSANT = B.NPRO
and    H.NPRO = 'p4';
```

8.6 COMPLÉMENTS SUR LES JOINTURES

8.6.1 Sous-requête ou jointure ?

```
select NCOM,DATECOM
from   COMMANDE
where  NCLI in (select NCLI
                from   CLIENT
                where  LOCALITE = 'Poitiers');
```

```
select NCOM,DATECOM
from   COMMANDE, CLIENT
where  COMMANDE.NCLI = CLIENT.NCLI
and    LOCALITE = 'Poitiers';

select *
from   COMMANDE
where  NCOM in (select NCOM
                from   DETAIL
                where  NPRO = 'PA60'
                and    QCOM < (select QCOM
                               from   DETAIL
                               where  NPRO = 'PA60'
                               and    NCOM = '30182'));

select M.NCOM, DATECOM, NCLI
from   COMMANDE M, DETAIL D1, DETAIL D2
where  M.NCOM = D1.NCOM
and    D1.NPRO = 'PA60'
and    D2.NCOM = '30182'
and    D2.NPRO = 'PA60'
and    D1.QCOM < D2.QCOM;

select NCOM, DATECOM, NCLI
from   COMMANDE
where  NCOM not in ( select NCOM
                     from   DETAIL
                     where NPRO = 'PA60');

select distinct COMMANDE.NCOM, DATECOM, NCLI
from   COMMANDE, DETAIL
where  COMMANDE.NCOM = DETAIL.NCOM
and    NPRO <> 'PA60';

select distinct COMMANDE.NCOM, DATECOM, NCLI
from   COMMANDE, DETAIL
where  COMMANDE.NCOM <> DETAIL.NCOM
and    NPRO = 'PA60';

select C.NCLI, C.NFOURN, ...
from   COMPTE C, ACHAT A
where  A.NCLI = C.NCLI
and    A.NFOURN = C.NFOURN
and    DATEA = '12-09-2009';
```

8.6.2 Valeurs dérivées dans une jointure

```
select NCOM, D.NPRO, QCOM*PRIX
from   DETAIL D, PRODUIT P
where  D.NPRO = P.NPRO;

select 'Montant commande 30184 = ', sum(QCOM*PRIX)
from   DETAIL D, PRODUIT P
where  D.NCOM = '30184'
```

```
and    D.NPRO = P.NPRO;
```

```
select distinct PRODUIT,VILLE,PRIX
from   VENTE V, LOCALISATION L
where  V.CHAINE = L.CHAINE;
```

```
select NCLI, NOM, CODE_CPT
from   CLIENT, CLASSE_CPT
where  CAT = 'C1'
and    COMPTE >= MIN_CPT and COMPTE < MAX_CPT;
```

8.6.3 Interprétation du résultat d'une jointure

```
select C.NCLI, NOM, LOCALITE
from   CLIENT C, COMMANDE M
where  M.NCLI = C.NCLI;
```

```
select *
from   TA, TB
where  TA.IA = TB.RA;
```

```
select COMMANDE.NCOM,DATECOM,NCLI
from   COMMANDE,DETAIL
where  COMMANDE.NCOM = DETAIL.NCOM;
```

```
select D.NCOM,D.NPRO,LOCALITE,LIBELLE
from   CLIENT CLI,COMMANDE COM,DETAIL D,PRODUIT P
where  CLI.NCLI = COM.NCLI
and    COM.NCOM = D.NCOM
and    D.NPRO = P.NPRO;
```

```
   select *
   from   TA, TB
   where  TA.IA = TB.RA;
```

```
select LOCALITE,LIBELLE
from   CLIENT CLI,COMMANDE COM,DETAIL D,PRODUIT P
where  CLI.NCLI = COM.NCLI
and    COM.NCOM = D.NCOM
and    D.NPRO = P.NPRO;
```

8.7 EXTRACTION DE DONNÉES GROUPÉES

8.7.1 Notion de groupe de lignes

```
select LOCALITE,
       count(*) as NOMBRE_CLIENTS,
       avg(COMPTE) as MOYENNE_COMPTE
from   CLIENT
group by LOCALITE;
```

8.7.2 Sélection de groupes et sélection de lignes

```
select LOCALITE, count(*), avg(COMPTE)
from   CLIENT
group by LOCALITE
having count (*) >= 3;

select NCLI, count(*)
from   COMMANDE
group by NCLI;

select NCLI, count(*)
from   COMMANDE
group by NCLI
having count(*) >= 2;

select NCLI, count(*)
from   COMMANDE
where  NCOM in ( select NCOM
                 from   DETAIL
                 where  NPRO = 'PA45')
group by NCLI
having count(*) >= 2;
```

8.7.3 Groupes et jointures

```
select M.NCLI, count(*), sum(QCOM)
from   COMMANDE M, DETAIL D
where  M.NCOM = D.NCOM
and    NPRO = 'PA45'
group by M.NCLI
having count(*) >= 2;

select 'Montant dû par ',C.NCLI,' = ',sum(QCOM*PRIX)
from   CLIENT C, COMMANDE M, DETAIL D, PRODUIT P
where  LOCALITE = 'Poitiers'
and    M.NCLI = C.NCLI
and    M.NCOM = D.NCOM
and    D.NPRO = P.NPRO
group by M.NCLI;

select P.NPRO, QSTOCK - sum(D.QCOM) as SOLDE
from   DETAIL D, PRODUIT P
where  D.NPRO = P.NPRO
group by P.NPRO, QSTOCK;
```

8.7.4 Composition du critère de groupement

```
select LOCALITE,P.NPRO,sum(QCOM*PRIX) as Montant
from   CLIENT C, COMMANDE M, DETAIL D, PRODUIT P
where  M.NCLI = C.NCLI
```

```
and    M.NCOM = D.NCOM
and    D.NPRO = P.NPRO
group by LOCALITE, P.NPRO;


select substring(CAT from 1 for 1) as CAT, count(*) as N
from   CLIENT
group by substring(CAT from 1 for 1);

select "de ", int(COMPTE/1000)*1000 as Min,
       " à ", int(COMPTE/1000)*1000 + 999 as Max,
       count(*) as N
from   CLIENT C
group by int(COMPTE/1000);
```

8.7.5 Attention aux groupements multiniveaux

```
select LOCALITE, sum(COMPTE), count(*)
from   CLIENT C, COMMANDE M
where  C.NCLI = M.NCLI
group by LOCALITE;

select M.NCLI,count(distinct M.NCOM),sum(QCOM*PRIX)
from   COMMANDE M, DETAIL D, PRODUIT P
where  M.NCOM = D.NCOM
and    D.NPRO = P.NPRO
group by M.NCLI;
```

8.7.6 Peut-on éviter l'utilisation de données groupées ?

```
select D.NPRO
from   DETAIL D, COMMANDE M
where  D.NCOM = M.NCOM
and    DATECOM like '%2009'
group by D.NPRO
having sum(QCOM) > 500;

select NPRO
from   PRODUIT P
where  (select sum(QCOM)
        from DETAIL
        where NPRO = P.NPRO
        and NCOM in (select NCOM from COMMANDE
                     where DATECOM like '%2008')) > 500;
```

8.8 ORDRE DES LIGNES D'UN RÉSULTAT

```
select NCLI, NOM, LOCALITE
from   CLIENT
where  CAT in ('C1','C2')
```

```
order by LOCALITE;

select *
from   CLIENT
order by LOCALITE, CAT;

select *
from   PRODUIT
where  LIBELLE like '%SAPIN%'
order by QSTOCK desc;

select LOCALITE, count(*) as POPULATION, sum(COMPTE)
from   CLIENT
group by LOCALITE
order by POPULATION desc;

select NCOM, NPRO, QCOM
from   DETAIL D, PRODUIT P
where  D.NPRO = P.NPRO
order by NCOM, QCOM*PRIX desc;
```

8.9 INTERPRÉTATION D'UNE REQUÊTE

```
7 :  select NCLI, count(*), sum(QCOM)
1 :  from   COMMANDE M, DETAIL D
2 :  where  M.NCOM = D.NCOM
3 :  and    NPRO = 'PA60'
4 :  group by NCLI
5 :  having count(*) >= 2
6 :  order by NCLI
```

8.10 MODIFICATION DES DONNÉES

8.10.1 Ajout de lignes

```
insert into DETAIL values ('30185','PA45',12);

insert into CLIENT (NCLI,NOM,ADRESSE,COMPTE,LOCALITE)
values ('C402','BERNIER','avenue de France, 28',
        -2500,'Lausanne');

insert into CLIENT_TOULOUSE
select NCLI, NOM, ADRESSE
from   CLIENT
where  LOCALITE = 'Toulouse';
```

8.10.2 Suppression de lignes

```
delete from  CLIENT
where NCLI = 'K111';

delete from  DETAIL
where NPRO in (select NPRO
               from   PRODUIT
               where  QSTOCK <= 0);
```

8.10.3 Modification de lignes

```
update CLIENT
set    ADRESSE = '29, av. de la Magne',
       LOCALITE = 'Niort'
where  NCLI = 'F011';

update PRODUIT
set    PRIX = PRIX * 1.05
where  LIBELLE like '%SAPIN%';

update PRODUIT P
set    QSTOCK = QSTOCK - (select sum(QCOM)
                          from   DETAIL
                          where  NPRO = P.NPRO)
where  exists (select * from DETAIL where NPRO = P.NPRO);
```

8.10.4 Mise à jour et contraintes référentielles

```
create table CLIENT ( NCLI char(10) not null, ...,
             primary key (NCLI) );

create table COMMANDE ( NCOM char(12) not null,
                        NCLI char(10) not null,
                       ...,
             primary key (NCOM),
             foreign key (NCLI) references CLIENT);

create table COMMANDE ( NCOM  char(12) not null,
                        NCLI  char(10) not null,
                        ...,
             primary key (NCOM),
             foreign key (NCLI) references CLIENT
                                on delete no action);
create table COMMANDE ( NCOM char(12) not null,
                        NCLI char(10) not null,
                        ...,
             primary key (NCOM),
             foreign key (NCLI) references CLIENT
                                on delete cascade);
```

```
create table COMMANDE ( NCOM char(12) not null,
                        NCLI char(10),
                        ...,
              primary key (NCOM),
              foreign key (NCLI) references CLIENT
                                 on delete set null);

create table COMMANDE ( NCOM char(12) not null,
                        NCLI char(10) not null,
                        ...,
              primary key (NCOM),
              foreign key (NCLI) references CLIENT
                                on delete no action
                                on update cascade);

create table CLIENT ( NCLI char(10) not null,
              primary key (NCLI) )

create table COMMANDE ( NCOM char(12) not null,
                        NCLI char(10) not null,
              primary key (NCOM),
              foreign key (NCLI) references CLIENT
                                 on delete cascade);

create table DETAIL ( NCOM char(12) not null,
                       NPRO char(15) not null,
              foreign key (NCOM) references COMMANDE
                                 on delete no action);
```

8.10.5 Déterminisme des requêtes de modification

```
update CLIENT set ADRESSE = LOCALITE, LOCALITE = ADRESSE;

create table PERSONNE ( NPERS       char (4) not null,
                        NOM         char(25) not null,
                        RESPONSABLE char (4),
              primary key (NPERS),
              foreign key (RESPONSABLE) references PERSONNE
              on delete no action);

delete from PERSONNE where NPERS = 'p2';
delete from PERSONNE where NPERS = 'p8';

I   delete from PERSONNE where NPERS in ('p2','p8');

delete from PERSONNE where C;

create table A(IA primary key, ...);
create table B(IB primary key, RA, ...,
            foreign key (RA) reference A on delete cascade);
create table C(IC primary key, RA, ...,
            foreign key (RA) reference A on delete cascade);
```

```
create table D(ID primary key, RB, RC, ...
            foreign key (RB) reference B on delete cascade,
            foreign key (RC) reference C on delete no action);
```