Bases de données avancées

Rapport du TP N°1: « SQL3 »

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21/06/2019

PARTIE 1 :

a) :

```
SQL> create type tnom as object(nom varchar2(20),prenom varchar2(20));
  2  /

Type created.

SQL> create type tadresse as object(rue varchar2(20),numero number(3),ville varchar2(20),
pays varchar2(20),codepostal number(5));
  2  /

Type created.

SQL> create type ttelephone as varray(6) of varchar2(10);
  2  /

Type created.
```

```
SQL> create type tpersonne as object(nss integer,nom tnom,date_naiss date,adresse tadress
e,telephone ttelephone) not final;
  2  /

Type created.
```

b)

```
SQL> alter type tpersonne add member function getage return int cascade;

Type altered.

SQL> create type body tpersonne as member function getage return int is
  2  begin
  3  return (sysdate-date_naiss);
  4  end;
  5  end;
  6  /

Type body created.
```

c)

```
SQL> create table personne of tpersonne;

Table created.
```

d)

```
SQL> insert into personne values(123456789,tnom('adimi','mohamed'),to_date('01/01/1980'),
tadresse('rue de la gare',22,'alger','algerie',1000),ttelephone('023112345','0554321921')
);

1 row created.
```

PARTIE 2 :

a)

```
SQL> create type tcompte as object(numero integer,banque varchar2(20));
  2  /

Type created.

SQL> create type tdiplome as object(nom varchar2(20),annee number(4));
  2  /

Type created.

SQL> create type tdiplomes as table of tdiplome;
  2  /

Type created.

SQL> create type tetudiant under tpersonne (netudiant number(4),departement varchar2(20),
diplome tdiplomes);
  2  /

Type created.

SQL> create type tenseignant under tpersonne(nenseignant number(4),compte tcompte);
  2  /

Type created.
```

b)

```
SQL> insert into personne values (tetudiant(123123123,tnom('merabeti','adam'),to_date('01/05/19
85'),tadresse('didouche mourad',NULL,'alger','algerie',NULL),ttelephone(),999,'informatique',td
iplomes()));

1 row created.
```

c)

```
SQL> insert into personne values(tenseignant(666999666,tnom('lamari','meriem'),to_date('04/06/1
975'),tadresse('boulevard colonel amirouche',99,'alger','algerie',NULL),ttelephone(),777,tcompt
e(3101234567,'BDA')));

1 row created.
```

d)

```
SQL> insert into personne values(tenseignant(556978566,tnom('salemi','ahmed'),to_date('04/06/19
65'),tadresse('ismail yafsah',99,'alger','algerie',NULL),ttelephone(),787,tcompte(330123489756,
'BEA')));

1 row created.
```

e)

```
SQL> update personne set telephone=ttelephone('022342222','066543333') where nom=tnom('merabeti
','adam');

1 row updated.
```

f)

```
SQL> update personne set telephone=(select telephone from personne where nom=tnom('merabeti','a
dam'))where nom=tnom('lamari','meriem');

1 row updated.
```

g)

```
SQL> select treat (value(P) as TETUDIANT).nom as NOM ,treat (value(P) as TETUDIANT).netudiant as Num from personne P;

NOM(NOM, PRENOM)                                                              '
-------------------------------------------------------------------------
       NUM
----------




NOM(NOM, PRENOM)
-------------------------------------------------------------------------
       NUM
----------
TNOM('merabeti', 'adam')
       999
```

h)

```
SQL> select p1.nom,p2.nom from personne p1,personne p2 ,table(p1.telephone) t1,table(p2.teleph
one) t2 where t1.column_value=t2.column_value and p1.nss!=p2.nss;

NOM(NOM, PRENOM)
-------------------------------------------------------------------------
NOM(NOM, PRENOM)
-------------------------------------------------------------------------
TNOM('lamari', 'meriem')
TNOM('merabeti', 'adam')
```

PARTIE 3 :

a) Creation du type *tcours* :

```
SQL> create type tcours as object (ncours varchar2(5),libelle varchar2(30),credit integer);
  2  /

Type created.
```

Creation du type *cours* :

```
SQL> create type cours as table of ref tcours;
  2  /

Type created.
```

Creation du type *enseignants* et ajout de l'attribut « cours » :

```
SQL> create type enseignants as table of ref tenseignant;
  2  /

Type created.
```

```
SQL> alter type tenseignant add attribute cours ref tcours cascade;

Type altered.
```

Creation du type *etudiants* :

```
SQL> create type etudiants as table of ref tetudiant;
  2  /

Type created.
```

Ajout des attributs «etudiantinscris » et « enseignantsres » au type *tcours* :

```
SQL> alter type tcours add attribute etudiantinscris etudiants cascade;

Type altered.
```

```
SQL> alter type tcours add attribute enseignantsres enseignants cascade;

Type altered.
```

Ajout de l'attribut «courssuiv » au type *tetudiant* :

```
SQL> alter type tetudiant add attribute courssuiv cours cascade;

Type altered.
```

Ajout des attributs « estpre » et « apre » au type *tcours* :

```
SQL> alter type tcours add attribute estpre cours cascade;

Type altered.

SQL> alter type tcours add attribute apre cours cascade;

Type altered.
```

Creation du type *tevaluation* :

```
SQL> create type tevaluation as object(datee date,note integer,coursev ref tcours,etudiantev r
ef tetudiant);
  2  /

Type created.
```

Creation du type *refevaluation* :

```
SQL> create type refevaluation as table of ref tevaluation;
  2  /

Type created.
```

Ajout de l'attribut « evaluationcours » au type *tcours* :

```
SQL> alter type tcours add attribute evaluationcours refevaluation cascade;

Type altered.
```

Ajout de l'attribut « evaluationetud » au type *tetudiant* :

```
SQL> alter type tetudiant add attribute evaluationetud refevaluation cascade;

Type altered.
```

b) Creation de la table « lescours » :

```
SQL> create table lescours of tcours nested table etudiantinscris store as lesetudiantsinscris
,nested table enseignantsres store as lesenseignantsres,
  2   nested table apre store as lesapre,nested table estpre store as lesestpre, nested table
evaluationcours store as lesevalcours;

Table created.
```

Creation de la table « evaluation » :

```
SQL> create table evaluation of tevaluation;

Table created.
```

c)

```
SQL> insert into lescours values('bda','base de donnees avancees',5,etudiants(),enseignants((s
elect treat(ref(p) as ref tenseignant)from personne p where p.nom=tnom('lamari','meriem'))),co
urs(),cours(),refevaluation());

1 row created.
```

Mise à jour des enseignants :

```
SQL> update (select treat(value(p) as tenseignant).cours as ce from personne p where p.nom=tno
m('lamari','meriem'))
  2  set ce=(select ref(c) from lescours c where c.ncours='BDA');

1 row updated.
```

d)

```
SQL> insert into lescours values('gdc','gestion des donnees',5,etudiants(),
  2  enseignants((select treat(ref(p) as ref tenseignant) from personne p where p.nom=tn
om('salemi','ahmed'))),cours(),cours((select ref(c) from lescours c where c.ncours='BDA'
)),refevaluation());

1 row created.
```

Mise à jour des enseignants :

```
SQL> update (select treat(value(p) as tenseignant).cours as ce from personne p where p.n
om=tnom('salemi','ahmed'))
  2  set ce=(select ref(c) from lescours c where c.ncours='gdc');

1 row updated.
```

Mise à jour de la table « cours » :

```
SQL> insert into table (select estpre from lescours c where c.ncours='bda') (select ref(
c) from lescours c where c.ncours='gdc');

1 row created.
```

e)

```
SQL> insert into table (select etudiantinscris from lescours c where c.ncours='bda')
  2  (select treat(ref(p) as ref tetudiant) from personne p where p.nom=tnom('merabeti',
'adam'));

1 row created.
```

Mise à jour des étudiants :

```
SQL> update(select treat(value(p) as tetudiant).courssuiv as cs from personne p where p.
nom=tnom('merabeti','adam')) set cs=cours((select ref(c) from lescours c where c.ncours=
'bda'));

1 row updated.
```

Insertion de l'evaluation :

```
SQL> insert into evaluation values('02/06/2010',13,(select ref(c) from lescours c where
c.ncours='bda'),
  2  (select treat(ref(p) as ref tetudiant) from personne p where p.nom=tnom('merabti','
adam')));

1 row created.
```

Mise à jour des cours(evaluation) :

```
SQL>  update (select evaluationcours as e from lescours c  where c.ncours='bda')
  2    set e=refevaluation((select ref(ev) from evaluation ev where coursev in (select r
ef(c) from lescours c where c.ncours='bda')
  3    and etudiantev=(select treat (ref(p) as ref tetudiant) from personne p where p.no
m=tnom('merabeti','adam'))));

1 row updated.
```

Mise à jours des étudiants (evaluation) :

```
SQL>  update (select treat(value (p) as tetudiant).evaluationetud e from personne p  wh
ere p.nom=tnom('merabeti','adam'))
  2    set e=refevaluation((select ref(ev) from evaluation ev where coursev in (select r
ef(c) from lescours c where c.ncours='bda')
  3    and etudiantev=(select treat (ref(p) as ref tetudiant) from personne p where p.no
m=tnom('merabeti','adam'))));

1 row updated.
```

f)

```
SQL> insert into table (select etudiantinscris from lescours c where c.ncours='gdc')
  2  (select treat(ref(p) as ref tetudiant) from personne p where p.nom=tnom('merabeti'
,'adam'));

1 row created.
```

Mise à jour des étudiants :

```
SQL> update(select treat(value(p) as tetudiant).courssuiv as cs from personne p where p
.nom=tnom('merabeti','adam'))
  2  set cs=cours((select ref(c) from lescours c where c.ncours='gdc'));

1 row updated.
```

Insertion de l'evaluation :

```
SQL> insert into evaluation values('02/06/2010',11,(select ref(c) from lescours c where
 c.ncours='gdc'),
  2  (select treat(ref(p) as ref tetudiant) from personne p where p.nom=tnom('merabti',
'adam')));

1 row created.
```

Mise à jour des cours(evaluation) :

```
SQL>  update (select evaluationcours as e from lescours c  where c.ncours='gdc')
  2   set e=refevaluation((select ref(ev) from evaluation ev where coursev in (select r
ef(c) from lescours c where c.ncours='gdc')
  3   and etudiantev=(select treat (ref(p) as ref tetudiant) from personne p where p.no
m=tnom('merabeti','adam'))));

1 row updated.
```

Mise à jours des étudiants (evaluation) :

```
SQL> update (select treat(value (p) as tetudiant).evaluationetud e from personne p  whe
re p.nom=tnom('merabeti','adam'))
  2   set e=refevaluation((select ref(ev) from evaluation ev where coursev in (select r
ef(c) from lescours c where c.ncours='gdc')
  3   and etudiantev=(select treat (ref(p) as ref tetudiant) from personne p where p.no
m=tnom('merabeti','adam'))));

1 row updated.
```

g)

```
SQL> select value(p).libelle from lescours c, table(c.estpre) p where c.ncours='bda';

VALUE(P).LIBELLE
----------------------------
gestion des donnees
```

h)
select ncours,(select AVG(value(e).note)from lescours c1,table(c1.evaluationcours) e where c.ncours=c1.ncours) from lescours c group by ncours;