```
drop table dinosaures;

create or replace type dinosaure as object(
nom varchar2(30),
espece varchar2(30),
poids number(10,1),
taille number(5,1),
constructor function dinosaure return self as result,
constructor function dinosaure(nom varchar2, espece varchar2) return self as result,
constructor function dinosaure(nom varchar2, espece varchar2, poids number, taille number) return
self as result,
map member function grosseur return number,
member function crier return varchar2
)not final;

create or replace type body dinosaure as
  constructor function dinosaure return self as result is
    begin
      self.nom:='gyum';
      self.espece:='yguanodon';
      self.poids:=666;
      self.taille:=2;
      return;
    end;
  constructor function dinosaure(nom varchar2, espece varchar2) return self as result is
    begin
      self.nom:=nom;
      self.espece:=espece;
      self.poids:=0;
      self.taille:=0;
      return;
    end;
  constructor function dinosaure(nom varchar2, espece varchar2, poids number, taille number)
return self as result is
    begin
      self.nom:=nom;
      self.espece:=espece;
      self.poids:=poids;
      self.taille:=taille;
      return;
    end;
  map member function grosseur return number is
    begin
      return (self.poids+1)/(self.taille+1);
    end;
  member function crier return varchar2 is
    begin
      return dinoPackage.rugir(self);
    end;
end;
```

```
drop table dinosaures2;

create or replace type dinosaure2 as object(
nom varchar2(30),
espece varchar2(30),
poids number(10,1),
taille number(5,1),
constructor function dinosaure2 return self as result,
constructor function dinosaure2(nom varchar2, espece varchar2) return self as result,
constructor function dinosaure2(nom varchar2, espece varchar2, poids number, taille number)
return self as result,
order member function predateur(m_obj dinosaure2) return integer
);

create or replace type body dinosaure2 as
  constructor function dinosaure2 return self as result is
    begin
      self.nom:='gyum';
      self.espece:='yguanodon';
      self.poids:=666;
      self.taille:=2;
      return;
    end;
  constructor function dinosaure2(nom varchar2, espece varchar2) return self as result is
    begin
      self.nom:=nom;
      self.espece:=espece;
      self.poids:=0;
      self.taille:=0;
      return;
    end;
  constructor function dinosaure2(nom varchar2, espece varchar2, poids number, taille number)
return self as result is
    begin
      self.nom:=nom;
      self.espece:=espece;
      self.poids:=poids;
      self.taille:=taille;
      return;
    end;
  order member function predateur(m_obj dinosaure2) return integer is
    begin
      if self.poids*self.taille < m_obj.poids*m_obj.taille then
          sys.dbms_output.put_line(self.nom || ' mange ' || m_obj.nom || ' !!!' );
          return -1;
        elsif self.poids*self.taille > m_obj.poids*m_obj.taille then return 1;
        else return 0;
      end if;
    end predateur;
end;
```

```
drop table dinosaures;
drop table descendants;

create or replace type descendant under dinosaure(
type varchar2(20),
constructor function descendant(nom varchar2, espece varchar2) return self as result,
constructor function descendant(nom varchar2, espece varchar2, type varchar2) return self as result,
overriding member function crier return varchar2,
member function crier(d descendant) return varchar2
);

create or replace type body descendant as
  member function crier(d descendant) return varchar2 is
    begin
      if self.type <> d.type then return ' .... .... .... .... ';
        elsif self.taille>d.taille then return self.nom || ' a gagné: zzbraaaaaaaaaa ';
        elsif self.taille<d.taille then return self.nom || ' a perdu: ouiiinnnnnnnnnnn ' || d.nom || ' :
mouahahahahaha !!!';
        else return ' paf paf paf paf ';
      end if;
    end;
  overriding member function crier return varchar2 is
    begin
      return dinoPackage.nouveauRugir(self);
    end;
  constructor function descendant(nom varchar2, espece varchar2) return self as result is
    begin
      self.nom:=nom;
      self.espece:=espece;
      self.poids:=0;
      self.taille:=0;
      self.type:='aerien';
      return;
    end;
  constructor function descendant(nom varchar2, espece varchar2, type varchar2) return self as
result is
    begin
      self.nom:=nom;
      self.espece:=espece;
      self.poids:=0;
      self.taille:=0;
      self.type:=type;
      return;
    end;
end;
```

```
SET SERVEROUTPUT ON;
drop table dinosaures;
drop table descendants;

create table dinosaures of dinosaure;

insert into dinosaures values(dinosaure('klouyé','triceratops anorexique'));
insert into dinosaures values(dinosaure('zouyé','tyranosaure',5000,5));
insert into dinosaures values(dinosaure('natlya','archeopteryx',6,2));
insert into dinosaures values(dinosaure('ruslan','liopleurodon',100000,12));
insert into dinosaures values(dinosaure('francois','lezard',1,1));
insert into dinosaures values(dinosaure('holland','lezard',2,1));
insert into dinosaures values(dinosaure('putin','megalodon',50000,15));
insert into dinosaures values(dinosaure());

select value(a) from dinosaures a;
select a.* from dinosaures a order by value(a).grosseur();
select a.* from dinosaures a order by value(a).grosseur() desc;

drop table dinosaures2;

create table dinosaures2 of dinosaure2;

insert into dinosaures2 values(dinosaure2('klouyé','triceratops anorexique'));
insert into dinosaures2 values(dinosaure2('zouyé','tyranosaure',5000,5));
insert into dinosaures2 values(dinosaure2('natlya','archeopteryx',6,2));
insert into dinosaures2 values(dinosaure2('ruslan','liopleurodon',100000,12));
insert into dinosaures2 values(dinosaure2('francois','lezard',1,1));
insert into dinosaures2 values(dinosaure2('holland','lezard',2,1));
insert into dinosaures2 values(dinosaure2('putin','megalodon',50000,15));
insert into dinosaures2 values(dinosaure2());

select value(a) from dinosaures2 a;
select value(a).nom, value(a).espece, value(a).predateur(c.obj) as peut_manger, c.obj.nom,
c.obj.espece
from dinosaures2 a, ( select value(b) as obj
                      from dinosaures2 b where nom='zouyé') c;


select value(a).nom, value(a).espece,value(a).crier() from dinosaures a;

select value(a).nom, value(a).espece,value(a).crier() from dinosaures a order by value(a).grosseur();


create table descendants of descendant;
insert into descendants values(descendant('zouyé','crocodile',50,2,'maritimezoui'));
insert into descendants values(descendant('gyum','fishkoyé','maritime'));
insert into descendants values(descendant('natlya','pigeon'));
insert into descendants values(descendant('klouyé','girafe',80,1,'terrestre'));
insert into descendants values(descendant('ruslan','moule',1,1,'maritime'));
insert into descendants values(descendant('angela','lion',150,1.5,'terrestre'));
insert into descendants values(descendant('merkel','anguille',1,3,'maritime'));
```

```
insert into descendants values(descendant('rimi','moineau',100,10,'aerien'));
insert into descendants values(descendant('grosRimi','dindon',40,4,'aerien'));

select value(a).nom, value(a).espece,value(a).crier() from descendants a;
select value(a).nom, value(a).espece,value(a).crier(c.obj)
from descendants a, ( select value(b) as obj
                      from descendants b where nom='grosRimi') c;

select value(a).nom, value(a).espece,value(a).crier(c.obj)
from descendants a, ( select value(b) as obj
                      from descendants b where nom='ruslan') c;
```