

Prolog : TP3

jeudi 25 septembre 2014

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classe 1.2

Question 1

```
/* QUESTION 2.1 */

inclus([],_).
inclus([Tete|Reste],Y):-membre(Tete,Y),
                        inclus(Reste,Y).

/***** TESTS *****/

| ?- inclus([2,3,6],[1,2,3,4,5]).

no
| ?- inclus([2,3,4],[1,2,3,4,5]).

true ?

*****/

non_inclus([Tete|Reste],Y):- (membre(Tete,Y),
                             non_inclus(Reste,Y));
                             hors_de(Tete,Y).

/***** TESTS *****/

| ?- non_inclus([2,3,4],[1,2,3,4,5]).

no
| ?- non_inclus([2,3,42],[1,2,3,4,5]).

true ?

*****/

union_ens([],L,L).
union_ens([Tete|Reste],Y,Z):- (non_inclus([Tete],Y),
                              union_ens(Reste,[Tete|Y],Z));
                              union_ens(Reste,Y,Z).

/***** TESTS *****/

| ?- union_ens([1,2,3],[4,5,6],Z).

Z = [3,2,1,4,5,6] ?

yes
| ?- union_ens([1,2,2],[3,5,6],Z).

Z = [2,1,3,5,6] ?

yes
| ?- union_ens([1,2,3],[3,5,6],Z).

Z = [2,1,3,5,6] ?
```

```
yes
```

```
*****/
```

Listing 1: listeQ1.pl

Question 2

```
/* QUESTION 1.1 */
```

```
membre(A, [A|_]).  
membre(A, [_|Reste]) :- membre(A, Reste).
```

```
/****** TESTS *****/
```

```
[eclipse 2]: membre(1, [1,2,3]).
```

```
Yes (0.00s cpu, solution 1, maybe more) ? ;
```

```
[eclipse 3]: membre(4, [1,2,3]).
```

```
No (0.00s cpu)
```

```
*****/
```

```
compte(_, [], 0).  
compte(A, [A|Reste], Cpt) :- compte(A, Reste, Cptbis) ,  
                             Cpt is Cptbis + 1.  
compte(A, [Tete|Reste], Cpt) :- \==(A, Tete) ,  
                                compte(A, Reste, Cpt).
```

```
/****** TESTS *****/
```

```
[eclipse 34]: compte(1, [1,1,1,3,1], N).
```

```
N = 4
```

```
Yes (0.00s cpu, solution 1, maybe more) ?
```

```
[eclipse 35]: compte(145, [1,1,1,3,1], N).
```

```
N = 0
```

```
Yes (0.00s cpu)
```

```
*****/
```

```
renverser([], A, A).  
renverser([Tete1|Reste1], A, R) :- renverser(Reste1, [Tete1|A], R).
```

```
/****** TESTS *****/
```

```
[eclipse 48]: renverser([1,2,3], [], N).
```

```
(1) 1 CALL renverser([1, 2, 3], [], N) %> creep
```

```
(2) 2 CALL renverser([2, 3], [1], N) %> creep
(3) 3 CALL renverser([3], [2, 1], N) %> creep
(4) 4 CALL renverser([], [3, 2, 1], N) %> creep
(4) 4 EXIT renverser([], [3, 2, 1], [3, 2, 1]) %> creep
(3) 3 EXIT renverser([3], [2, 1], [3, 2, 1]) %> creep
(2) 2 EXIT renverser([2, 3], [1], [3, 2, 1]) %> creep
(1) 1 EXIT renverser([1, 2, 3], [], [3, 2, 1]) %> creep

N = [3, 2, 1]
Yes (0.00s cpu)

*****/

comparer([], []).
comparer([Tete1|Reste1], [Tete1|Reste2]) :- comparer(Reste1, Reste2).

palind(L1) :- renverser(L1, [], L2),
              comparer(L1, L2).

/***** TESTS *****/

[eclipse 2]: palind([1,2,3,2,1]).

Yes (0.00s cpu)
[eclipse 3]: palind([1,2,3,2,1,65]).

No (0.00s cpu)

*****/

nieme(1, [Tete|_], Tete).
nieme(N, [_|Reste], A) :- \==(N, 1),
                        nieme(N2, Reste, A),
                        N is N2+1.

/***** TESTS *****/

[eclipse 3]: nieme(5, [1,2,3,4,5,6,7,8,9], A).
A = 5

*****/

hors_de(_, []).
hors_de(A, [Tete|Reste]) :- \==(A, Tete),
                           hors_de(A, Reste).

/***** TESTS *****/

[eclipse 6]: hors_de(5, [1,2,3]).
Yes (0.00s cpu)

[eclipse 7]: hors_de(3, [1,2,3]).
No (0.00s cpu)
```

```
*****/

tous_diff([]).
tous_diff([Tete|Reste]) :-hors_de(Tete,Reste),
                        tous_diff(Reste).

/***** TESTS *****/

[eclipse 9]: tous_diff([1,2,3,4,5]).
Yes (0.00s cpu)

[eclipse 10]: tous_diff([1,4,3,4,5]).
No (0.00s cpu)

*****/

conc2([],L,L).
conc2([Tete|Reste],L2,[Tete|R]) :-conc2(Reste,L2,R).

conc3([],[],L,L).
conc3(L1,L2,L3,R) :-conc2(L1,L2,L12),
                    conc2(L12,L3,R).

/***** TESTS *****/

[eclipse 24]: conc3([1,2,3],[4,5,6],[7,8,9],R).

R = [1, 2, 3, 4, 5, 6, 7, 8, 9]
Yes (0.00s cpu)

*****/

debute_par(_,[]).
debute_par([Tete1|Reste1],[Tete1|Reste2]) :-debute_par(Reste1,Reste2).

/***** TESTS *****/

[eclipse 26]: debute_par([1,2,3,4,5,6],[1,2,3]).

Yes (0.00s cpu)
[eclipse 27]: debute_par([1,2,4,4,5,6],[1,2,3]).

No (0.00s cpu)

*****/

sous_liste(L1, L2) :-debute_par(L1,L2).
sous_liste([_|Reste1], L2) :-sous_liste(Reste1,L2).

/***** TESTS *****/

[eclipse 39]: sous_liste([1,2,4,1,2,3],[1,2,3]).

Yes (0.00s cpu, solution 1, maybe more) ? ;
```

```
No (0.00s cpu)
[eclipse 40]: sous_liste([1,2,4,1,2,3],[1,2,3]).

Yes (0.00s cpu, solution 1, maybe more) ?
[eclipse 41]: sous_liste([1,2,4,1,2,8],[1,2,3]).

No (0.00s cpu)

*****/

elim([],L,L).
elim([Tete|Reste],L2,R):- (membre(Tete,L2),
                           elim(Reste,L2,R));
                           elim(Reste,[Tete|L2],R).

/***** TESTS *****/

[eclipse 43]: elim([1,2,2,2,3,7,4,5,5,9],[],R).

R = [9, 5, 4, 7, 3, 2, 1]

*****/

inserer(E,[Tete|Reste],[Tete|Reste2]):-E>Tete,
                                         inserer(E,Reste,Reste2).
inserer(E,L1,[E|L1]).

/***** TESTS *****/

| ?- inserer(4,[1,2,3,5],L).

L = [1,2,3,4,5] ?

| ?- inserer(4,[1,2],L).

L = [1,2,4] ?

*****/

tri([E],[E]).
tri([Tete|Reste],R):-tri(Reste,Rtmp), inserer(Tete,Rtmp,R).

/***** TESTS *****/

| ?- tri([9,8,7,6,5,4,3,2,1],L).

L = [1,2,3,4,5,6,7,8,9] ?

*/
```

Listing 2: listeQ2.pl

dzdz ssasas