Compte Rendu TP1

Question1

```
voiture(rouge).
voiture(vert(clair)).
voiture(gris).
voiture(blanc).

bateau(vert(_)).
bateau(noir).
bateau(blanc).

choixCouleur(CouleurBateau,CouleurVoiture):-
        bateau(CouleurBateau),
        voiture(CouleurVoiture).
```

Tests

```
choixCouleur(noir,vert(clair)).

Yes (0.00s cpu)
```

Question2

Prolog est un solveur de contrainte sur le domaine des arbres car les contraintes sur les arbres sont des contraintes passives, et prolog sait résoudre les contraintes passives

Question3

```
isBetween(Min,Min,Max):-
        Max >= Min.
isBetween(Var,Min,Max):-
        X is Min+1,
        X=<Max,
        isBetween(Var,X,Max).
```

Tests

```
?- isBetween(5,2,7).
Yes (0.00s cpu, solution 1, maybe more)

?- isBetween(X,6,8).
[eclipse 4]: ?- isBetween(X,6,8).

X = 6
Yes (0.00s cpu, solution 1, maybe more) ? ;

X = 7
Yes (0.00s cpu, solution 2, maybe more) ? ;
```

```
X = 8
Yes (0.00s cpu, solution 3, maybe more) ? ;

No (0.00s cpu)
```

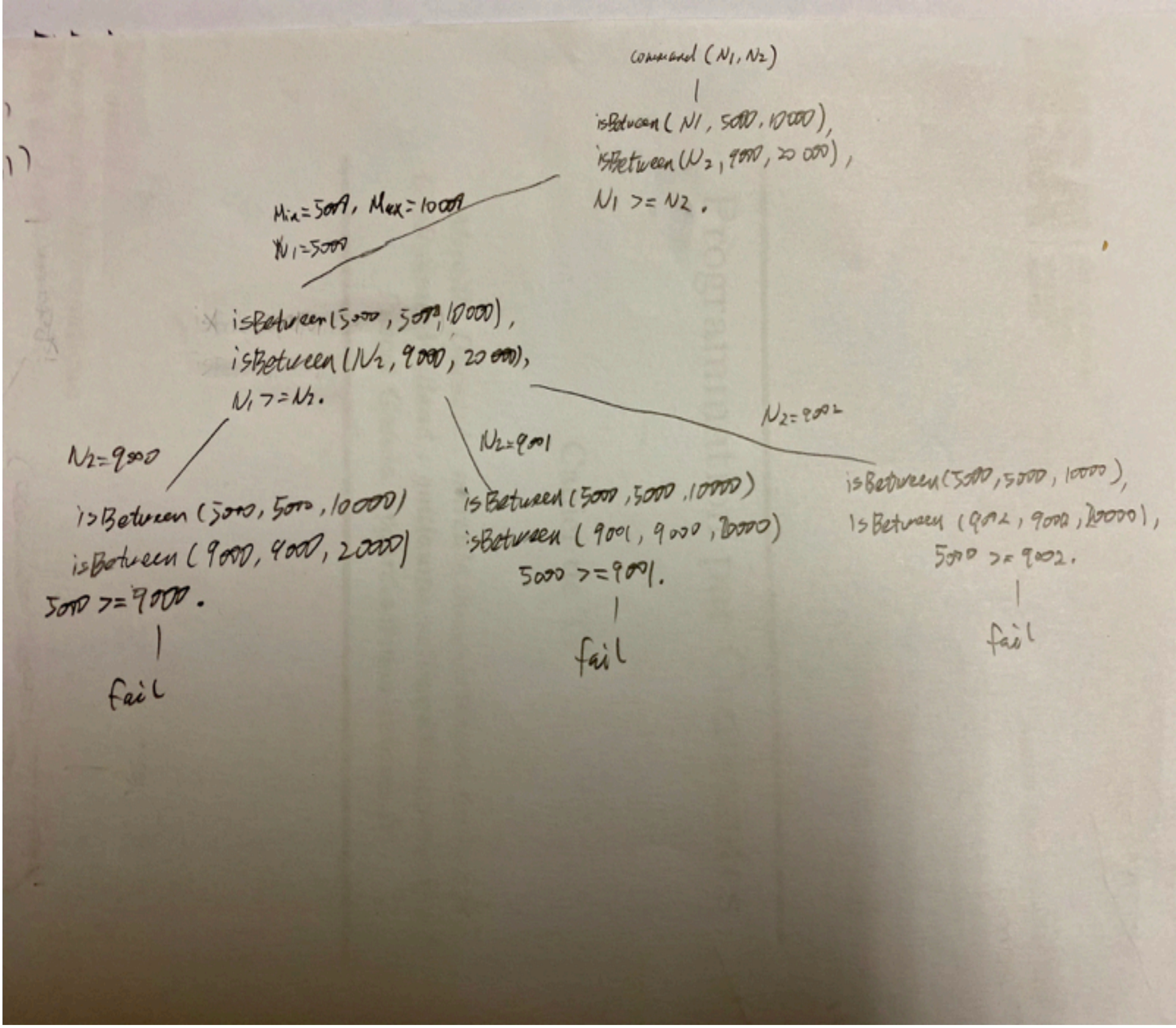
Question4

```
commande(NbResistance,NbCondensateur):-
        isBetween(NbResistance,5000,10000),
        isBetween(NbCondensateur,9000,20000),
        NbResistance>=NbCondensateur.
```

Tests

```
commande(X,Y).
[eclipse 5]: commande(X,Y).
lists.eco  loaded in 0.00 seconds

X = 9001
Y = 9000
Yes (0.00s cpu, solution 1, maybe more) ? ;

X = 9002
Y = 9000
Yes (0.00s cpu, solution 2, maybe more) ? ;

X = 9002
Y = 9001
Yes (0.00s cpu, solution 3, maybe more) ? ;

X = 9003
Y = 9000

commande(6500,9500). No
commande(10000,8000). No
```

Question5


command (N1, N2)
isBetween(N1, 5000, 10000),
isBetween(N2, 9000, 20 000),
N1 >= N2.
Min=5000, Max=10000
N1=5000
isBetween(5000, 5000, 10000),
isBetween(N2, 9000, 20000),
N1 >= N2.
N2=9000
isBetween (5000, 5000, 10000)
isBetween (9000, 9000, 20000)
5000 >= 9000.
fail
N2=9001
isBetween (5000, 5000, 10000)
isBetween (9001, 9000, 20000)
5000 >= 9001.
fail
N2=9002
isBetween(5000, 5000, 10000),
isBetween (9002, 9000, 20000),
5000 >= 9002.
fail

Question6

On ne peut pas comparer les valeurs avant de les avoir instanciées,
donc on doit les générer avant de pouvoir les tester

Question7

```
commande(NbResistance,NbCondensateur):-
        NbResistance#::(5000..10000),
        NbCondensateur#::(9000..20000),
        NbResistance#>NbCondensateur.
```

Tests

```
commande(X,Y).
X = X{9001 .. 10000}
Y = Y{9000 .. 9999}
Ce résultat donne les nouveau domaines possibles mais n'instancie pas les variables
```

Question8

```
commande(NbResistance,NbCondensateur):-
        NbResistance#::(5000..10000),
        NbCondensateur#::(9000..20000),
        NbResistance#>NbCondensateur,
        labeling([NbResistance,NbCondensateur]).
```

Tests

```
[eclipse 10]: commande(X,Y).

X = 9001
Y = 9000
Yes (0.00s cpu, solution 1, maybe more) ? ;

X = 9002
Y = 9000
Yes (0.01s cpu, solution 2, maybe more) ? ;

X = 9002
Y = 9001
Yes (0.01s cpu, solution 3, maybe more) ? ;

X = 9003
Y = 9000
Yes (0.01s cpu, solution 4, maybe more) ?
```

Question9

```
chapie(Chats,Pies,Pattes,Tetes):-
        Chats#>=0,
        Pies#>=0,
        Pattes#>=0,
        Tetes#>=0,
        Pattes#=Chats*4+Pies*2,
        Tetes#=Chats+Pies.
```

Tests

```
chapie(2,X,Y,5).
X = 3
Y = 14
Yes (0.00s cpu)
```

Question10

```
chapie(Chats,Pies,X,Y), X#=Y*3,Pies#<1000,labeling( [Chats,Pies,X,Y]).
```

Tests

```
Chats = 0
Pies = 0
X = 0
Y = 0
Yes (0.00s cpu, solution 1, maybe more) ? ;

Chats = 1
Pies = 1
X = 6
Y = 2
Yes (0.01s cpu, solution 2, maybe more) ?
...
```

Question11

```
/**or/2*/
vabs(Val,AbsVal):-
        (Val#>=0,Val#=AbsVal) or (Val#<0,AbsVal #= 0-Val).
```

Tests

```
[eclipse 91]: ?- vabs(-5,Y).

Y = 5
Yes (0.00s cpu)
[eclipse 92]: ?- vabs(4,X).

X = 4
Yes (0.00s cpu)
[eclipse 93]: ?- vabs(-8,8).

Yes (0.00s cpu)
```

```
/**Point de choix

vabs(Val,Val):-
        Val#>=0.
vabs(Val,AbsVal):-
        Val#<0,
        AbsVal #= 0-Val.
```

Tests

```
?- vabs(4,X).

X = 4
Yes (0.00s cpu, solution 1, maybe more) ?
?- vabs(-5,Y).

Y = 5
Yes (0.00s cpu)
?- vabs(-8,8).

Yes (0.00s cpu)
```

Question12

```
/**or/2
X#:: -10..10,vabs(X,Y),labeling([X,Y]).
```

Tests

```
Echantillion :
X = -4
Y = 4
Yes (0.00s cpu, solution 7, maybe more) ? ;

X = -3
Y = 3
Yes (0.00s cpu, solution 8, maybe more) ? ;

X = -2
Y = 2
Yes (0.00s cpu, solution 9, maybe more) ? ;

X = -1
Y = 1
Yes (0.00s cpu, solution 10, maybe more) ? ;

X = 0
Y = 0
Yes (0.00s cpu, solution 11, maybe more) ? ;

X = 1
Y = 1
Yes (0.00s cpu, solution 12, maybe more) ? ;

X = 2
Y = 2
Yes (0.00s cpu, solution 13, maybe more) ? ;

X = 3
Y = 3
Yes (0.00s cpu, solution 14, maybe more) ? ;

X = 4
Y = 4
Yes (0.00s cpu, solution 15, maybe more) ? ;

X = 5
Y = 5
Yes (0.00s cpu, solution 16, maybe more) ? ;
```

```
X = 6
Y = 6
Yes (0.00s cpu, solution 17, maybe more) ? ;

X = 7
Y = 7
Yes (0.01s cpu, solution 18, maybe more) ? ;

X = 8
Y = 8
Yes (0.01s cpu, solution 19, maybe more) ? ;
*/
```

```
/**Point de choix
X#:: -10..10,vabs(X,Y),labeling([X,Y]).
```

Tests

```
Echantillion
X = 5
Y = 5
Yes (0.00s cpu, solution 6, maybe more) ? ;

X = 6
Y = 6
Yes (0.00s cpu, solution 7, maybe more) ? ;

X = 7
Y = 7
Yes (0.00s cpu, solution 8, maybe more) ? ;

X = 8
Y = 8
Yes (0.00s cpu, solution 9, maybe more) ? ;

X = 9
Y = 9
Yes (0.00s cpu, solution 10, maybe more) ? ;

X = 10
Y = 10
Yes (0.00s cpu, solution 11, maybe more) ? ;

X = -10
Y = 10
Yes (0.00s cpu, solution 12, maybe more) ? ;

X = -9
Y = 9
Yes (0.00s cpu, solution 13, maybe more) ? ;

X = -8
Y = 8
Yes (0.00s cpu, solution 14, maybe more) ? ;

X = -7
Y = 7
Yes (0.00s cpu, solution 15, maybe more) ? ;

X = -6
Y = 6
Yes (0.00s cpu, solution 16, maybe more) ?
```

La différence principale est l'ordre dans lequel les variables sont instanciées
Avec le or, tous l'intervalle est testé en même temps,
avec le point de choix il est d'abord séparé e deux

Question13

```
faitListe(ListVar,Taille,Min,Max):-
        length(ListVar,Taille),
        ( foreach(Elem,ListVar),
        param(Min,Max)
        do
                Elem#::Min..Max
        ).
```

Tests

```
//
```

Question14

```
faitSuite([_,_]).
faitSuite([X,Y,Z|R]):-
        vabs(Y,Yabs),
        Z #= Yabs - X,
        faitSuite([Y,Z|R]).
```

Tests

```
[eclipse 10]: faitSuite([1,2,3,4,5]).

Yes (0.00s cpu)
```

Question15

```
periode_neuf([X,Y,_,_,_,_,_,_,_,X1,Y1]):-
        X#=X1,
        Y#=Y1.

contre_exemple:-
        X#::(-100..100),
        Y#::(-100..100),
        faitSuite([X,Y,_,_,_,_,_,_,_,X1,Y1]),
        (X#\=X1) or (Y#\=Y1),
        labeling([X,Y]).
```

```
periode_neuf([1,2,3,4,5,6,7,8,9]).

Yes (0.00s cpu)
```

Pour avoir une période de 9 il suffit que le 10 élément soit égal au 1er et le 11e au 2e, puisque la suite est définie par ses deux derniers éléments lorsqu'on execute contre_exemple, on obtient No, ce qui signifie qu'aucune liste qui satisfait la suite n'est pas de période 9 -> Toutes les listes satisfaisant la suite sont de période 9