Starting with Assignment 3

Step 1: Develop your solutions locally:

Make sure that the CLP(FD) library is included in your program as follows:
:- use_module(library(clpfd)) .

Be aware that execution times of the queries may last significantly longer than in Assignment 2.

Like with Assignment 2, you shall solve the queries locally by using
the **SWI-Prolog-Interpreter -**
either by double-clicking the file a3.pl (or by opening it from command line, i.e.
using **swipl-win** -s a3.pl in **Windows**
or using **./swipl** -s a3.pl in **MacOS** or **Linux**)

and the **SWI-Prolog-Editor .**

Step 2: Complete the assignments before you upload your solutions:

Upload your solution files not earlier than when you have done all assignments and commented your solutions as described below.

Before you upload your solutions, do a double check using the tester3 program.
Be aware that execution times of the tester3 may last significantly longer than your query in the interpreter!
The version of the test program differs depending on the operating system:

1. for Windows use **tester3**.exe
2. for MacOS use **tester3**
3. for OpenSuse Linux use **tester3suse**

1. Assuming that your program is called **a3.pl** and that you want to check your solution to query **1** (i.e. q31(L1,L2,L3,L4,L5)), in **Windows** use a CMD-Shell to call:
   > tester**3** a**3** **1**
   (here, you shall use the Windows version tester**3**.exe)

2. Assuming that your program is called **a3.pl** and that you want to check your solution to query **1** (i.e. q31(L1,L2,L3,L4,L5)), in **MacOS** use a shell to call:
   > **./**tester**3** a**3** **1**
   (here, you shall use the MacOS version tester**3**)

3. Assuming that your program is called **a3.pl** and that you want to check your solution to query **1** (i.e. q31(L1,L2,L3,L4,L5)), in **OpenSuse Linux** use a shell to call:
   > **./**tester**3suse** a**3** **1**
   (here, you shall use the OpenSuse Linux version tester3suse)

Actions to be taken depending on the feedback of the program tester3:

If you get an error message query q31(L1,L2,L3,L4,L5) is undefined, make sure that you have named your procedures like in Assignment 3, i.e. q31(L1,L2,L3,L4,L5), … and that the number of parameters is correct.
If the program tester3 tells you that your solution is different from the wanted solution, look at the counter example presented to show the difference - and rewrite your query.
If need an idea how to get more solutions or fewer solutions, watch videos 2.7.x and repreat the quiz 2.7.
May be, you have to do this multiple times until you have a correct solution.

If the program tester3 tells you that your solution is equivalent to the wanted solution, but it takes more clauses and/or more goals, try to improve your solution (i.e. find a shorter solution). May be, you have to do this multiple times until you have a short solution.
Hint: Try to find a correct solution in the first place. Once your solution is equivalent to the wanted solution, but not short enough, try inlining (→ Video 1.10) to get a shorter solution.

If the execution time of your queries is extremely long (much longer than given in the description of a3.pl), you should try to speed-up your solution by checking the goal order (Video 2.4 and Quiz 2.4), checking whether you stated all constraints, and checking whether you have used the fastest strategies (videos 3.x) and have used the CLP(FD) built-in predicates and Prolog built-in predicates proposed in videos 3.x.

If program tester3 tells you that your solution is most likely correct, the tester could not detect any difference. Then you should prepare for explaining your solution.
You are requested to write a short (2-4 lines) comment about your solution below your code as part of the file that you upload. For example:

```
q34( … ) :-     <  here is your implementation of q34 >

% For constraint propagation, I used the same technique as in demo program … because …
% I avoided to see duplicate solutions by …
```

After commenting your solution, please check that it still compiles without warning (i.e. that it does NOT generate UTF-code warning messages)!