Exercise 6.1:
Consider the following program. Give the full Prolog tree, ignoring the cut operator. Then indicate which branches would be ignored by the cut operator.

1 t(a).
2 t(b).
3 t(c).
4 u(c).
5 u(b).
6 w(a).
7 w(b).
8 w(c).

9 p(X) :- q(X).
10 p(X) :- r(X).
11 p(X) :- s(X).

12 q(X) :- t(X), u(X).
13 r(X) :- t(X), u(X), v(X).
14 s(X) :- v(X), u(X).

15 v(X) :- w(X), !.

Exercise 6.2:
Consider the following program:

1 p([],X,X).
2 p([F|R1],X,[F|R2]) :- p(R1,X,R2).

a) Provide the full Prolog tree for the query ?- p(X,Y,[1,2]).

b) Indicate the Prolog tree for the query ?- p(X,[1,2],Z).
c) Provide a level mapping for which the program is recurrent.

d) Is the query in a) bound w.r.t. the level mapping defined in c)?

**Additional Exercise 6.3:**
Consider the following program:

\[
\begin{align*}
p(X) & \leftarrow r([a|X]) \\
r([Y|X]) & \leftarrow s(X) \\
s([Y|X]) & \leftarrow p(X)
\end{align*}
\]

a) Provide a level mapping for which the program is recurrent.

b) Provide a bounded query for this level mapping which contains at least one variable.

c) Provide an unbounded query for this level mapping.