Aufgabe 11.1.  [DPNs]  (10 points)

1. Specify a DPN for the example program from slide 112:

```c
void p () {
  if (...) {
    spawn p;
    p();
  }
}

main () {
  p();
}
```

2. Specify an execution, step by step\(^1\), that reaches a configuration of the following shape:

\(^1\)Specify the initial, intermediate, and final configurations, and the rules used.
Aufgabe 11.2. [Context Independence] (10 points)
The execution of a thread in a DPN does not depend on its context. In particular, we can embed a given execution into a larger context. Let $M = (P, \Gamma, \text{Act}, p_0, \gamma_0, \Delta)$ be a DPN, $c, c' \in conf$ be configurations.

1. Let $C$ be a context with exactly one occurrence of $x_1$. Show

$$c \xrightarrow{\cdot} c' \implies C[c] \xrightarrow{\cdot} C[c']$$

2. Now let $C$ be a context that contains $x_1$ exactly $n$ times.
   a) Give an example that the above statement does not hold any more.
   b) Show

$$c \xrightarrow{\cdot} c' \implies C[c] \xrightarrow{\cdot} C[c']$$

Where $l^n := \{l, \ldots, l\} \text{ n times}$ is the $n$-fold repetition of the sequence $l$. Hint: Construct the execution for each position of $x_1$ in $C$ separately. For this, you may want to re-phrase the result from 1) to positions.