Exercise 1.1:
Using the Prolog program from Slide 3-6 (Lecture 1), give the answer for the following queries:

- ?-connection(frankfurt,X).
- ?-connection(X, maui).

Exercise 1.2:
Define in Prolog a predicate for multiplication. (You may want to use the predicate add defined on Slide 10, Lecture 1.) Give the output for the following queries:

- ?-mul(s(s(0)), s(s(s(0))), Z).
- ?-mul(s(s(0)), s(s(0)), s(s(s(s(s(0)))))).

Exercise 1.3:
Now use your definition from Exercise 1.2 to define the factorial function.

- Example: ? - fact(s(s(0))), F ) has the result F = s(s(s(s(s(s(0)))))).

Exercise 1.4:
Define a predicate palindrome(L) which checks if the list L is a palindrome, i.e. the reverse of L is identical to L.

- Example: ? - palindrome([a, b, c, b, a]) has result yes.

Exercise 1.5:
Compute the substitution composition \( \theta, \eta, \tau \), where \( w, x, y, z \) are variables and

\[
\theta = \{ y/a(x, z), z/y \} \quad \eta = \{ y/x, x/f(w) \} \quad \tau = \{ w/g(a), x/z, z/b \}
\]