

Foundations of Logic Programming

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Exercise 1.1

Using the Prolog program from Slides I/3-I/6, 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 I/10.) 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(s(0))), F)` has the result $F = s(s(s(s(s(0)))))$.

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

Define a predicate `delelem(K,L,Elem,RL)` which deletes the K -th element from list L and returns the deleted element $Elem$ and the reduced list RL .

Example: `? - delelem(4,[3,4,5,4],Elem,RL)` gives $Elem = 4$ and $RL = [3,4,5]$ as result.