

Foundations of Logic Programming

Tutorial 1 (on October 20th)

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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(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:

Compute the substitution composition θ, η, τ , where w, x, y, z are variables and

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