

- Please write all your Haskell functions from this exercise sheet into a single .hs-file and upload it in OLAT.
- You can use a template .hs-file that is provided on the proseminar page.
- The file should compile with ghci.
- Once the file has been uploaded, it cannot be changed or resubmitted!

### Exercise 2.1 *Live exercises*

Another divide-and-conquer way of computing  $\binom{n}{k}$  is based on  $\binom{n}{k} = \frac{n}{k} \binom{n-1}{k-1}$ . Compute  $\binom{3}{2}$  by hand using this so-called *falling factorial* and write the corresponding Haskell function with type signature:

```
binom_ff :: Integer -> Integer -> Integer
```

Think about what is best to do first, e.g. first computing the fraction  $\frac{n}{k}$  and then multiplying or some other order, and why.

Do experiments to determine which of the three ways to compute binomial coefficients, the two ways of the second exercise and this one, is the fastest. (If you didn't do the second exercise, first do that.) Can you explain the results of your experiments?