

# 185.A05 Advanced Functional Programming SS 21

Thursday, 4 March 2021

## Assignment 0

**Topic: Test the Test System**

**1st test system run:** Submit `Assignment0.hs` till Wed, 17 March 2021, 12am

**2nd test system run:** Submit `Assignment0.hs` till Thu, 18 March 2021, 12am

(No grading of Assignment 0!)

### Purpose of Assignment 0:

Submitting assignment 0

1. is voluntarily, not obligatorily.
2. shall provide you an opportunity to
  - (a) double-check if your programming environment works properly with the new test system and that your submission files meet the required formatting constraints.
  - (b) get acquainted with positive and negative feedback notifications of the new test system.

There will be two runs of the test system applied to your submission file named `Assignment0.hs` and stored as a top-level file in your group home directory. In order to receive feedback from the first run of the test system, you must submit your file no later than Wednesday, 17 March 2021, 12am. In case your programming environment is not in place till then, you can submit your file before Thursday, 18 March 2021, 12am, in order to receive feedback of the second run of the test system.

### Programming tasks to get acquainted with positive test system feedback:

Implement:

```
type Nat0 = Integer

factorial :: Nat0 -> Nat0
factorial n...

fibonacci :: Nat0 -> Nat0
fibonacci n...

binom :: Nat0 -> Nat0 -> Nat0
binom m n...
```

## Programming tasks to get acquainted with negative test system feedback:

Copy the below functions to your file `Assignment0.hs`:

```
-- Faulty implementation
fac_faulty :: Nat0 -> Nat0
fac_faulty n
  | n < 0    = fac_faulty (-n)
  | n == 0   = 1
  | n <= 10 = n * fac_faulty (n-1)
  | n <= 15 = n + fac_faulty (n-1)
  | True    = fac_faulty 42

- Faulty implementation; type signature required by the test system is missing
fib_faulty 0 = 0
fib_faulty 1 = 1
fib_faulty n = fib_faulty (n-2) * fib_faulty (n-1)

binom_faulty :: Int -> Int -> Int
binom_faulty n k = div (factorial n) (factorial k * fac_faulty (n-k))

-- Enforcing test system time-outs
fib_slow :: Nat0 -> Nat0
fib_slow 0 = 0
fib_slow 1 = 1
fib_slow n = fib_slow (n-2) + fib_slow (n-1)
```

Note, there will be also a test of a function `foo`. This is to trigger the system feedback if a function expected of being implemented in the submission file is actually not.

### Important:

1. Carefully read and follow the instructions outlined in the complementary files provided with assignment 0. Following these instructions is paramount to ensure a smooth processing of your submitted file by the test system.
2. Store all functions to be written for assignment 0 in a top-level file named `Assignment0.hs` of your group home directory. The very same file name shall be used for the second submission of assignment 0.
3. *Do not use self-defined modules!* If you want to re-use functions (written for other assignments), copy them to `Assignment0.hs`. Import declarations for self-defined modules will fail: Only `Assignment0.hs` will be copied for the (semi-automatic) evaluation procedure, no other ones.

*Iucundi acti labores.  
Getane Arbeiten sind angenehm.*  
Cicero (106 - 43 v.Chr.)  
röm. Staatsmann und Schriftsteller