

# Exercise 11 – Kristoffer Aamodt

- 1) The code consists of a base case (a) and an inductive step (b). Both are described in the following.

a) **Base case**

The base case of fact is that for  $n = 1$ , the factorial is 1  $\rightarrow \mathbf{Fact(1) = F_1 = 1}$ .

b) **Inductive step**

We assume that for a given integer  $k$  as input,  $k > 1$ , then:

$F_k = \text{fact}(k) = k * \text{fact}(k-1)$ ,  $\text{fact}(k-1) = (k-1) * \text{fact}(k-2)$  etc...

If we now choose to go the opposite way, we know that  $F_1$  is correct, meaning that  $F_2$  is correct, again meaning that  $F_3$  is correct and so forth. This creates a finite chain up to  $F_k$ . **Thus Fact(k) is correct.**