

Let's number the two exercises that you did in the [last tutorial](#), Examples 71 and 72. Example 73, the correctness proof of recursive `binSearch` was presented in class [this week](#). Here, there are two more well-known problems:

- **Example 74.** Think of a brute-force algorithm for multiplication of two  $n$ -digit numbers, let's say  $A$  and  $B$ , in which  $A$  is added to itself  $B$  times. What is the time complexity of this algorithm in terms of number of digits added? Try to develop a more efficient algorithm using D&C. If you needed a hint, look up the Karatsuba multiplication. What is the time complexity of your new algorithm?
- **Example 75.** Prove the `mergeSort` algorithm presented in Example is correct.

We do not intend to publish solutions (or solutions outline) for any of the questions of the course notes, or extra practices. You are more than welcome to discuss your solutions with us.