Exercises

E7.4 [OD0] Prerequisites: [OCX], [OCS]. Let again $a_{n,m}$ be a real valued sequence with two indices $n, m \in \mathbb{N}$; suppose that, for every n, the limit $\lim_{m\to\infty} a_{n,m} = b_n$ exists, is finite and is uniform in n; suppose that the limit $\lim_n b_n$ exists and is finite. Can it be concluded that the limits $\lim_{n\to\infty} a_{n,m}$ exist for each fixed m? Can we write an equality as in eqn. [(7.3)] in which, however, on the RHS we use the upper or lower limits of $a_{n,m}$ for $n \to \infty$, instead of the limits $\lim_{n\to\infty} a_{n,m}$?

Solution 1. *[OD1]*