Exercises

E8.104 [0MP]Difficulty:*.We restrict the topology described in the previous example to the set $Y = [0,1]^{[0,1]}$ (that is, we restrict $\mathbb{R}$ to $[0,1]$, and set $\Omega = [0,1]$). Find a sequence $(f_n) \subset Y$ that does not allow a convergent subsequence.

Solution 1. *[0MQ]*

Let's recall the definition [0J3]: a space X is "compact by coverings" *if, for every $(A_i)_{i\in I}$ family of open such that $\bigcup_{i\in I} A_i = X$, there is a finite subfamily $J \subset I$ such that $\bigcup_{i\in J} A_i = X$. The Tychonoff theorem shows that this space Y is "compact by coverings". This exercise shows you instead that Y it is not "compact by sequences".*