GENERAL TOPOLOGY
HOMEWORK FOR WEEK 2

DEADLINE: MON 10.3, 23:59

Exercise 1. *Let* X *be a Hausdorff space and suppose that* $(x_n), (y_n)$ *are two sequences in* X *which converge to points* x *and* y *respectively. Furthermore, assume that for every* $n \in \mathbb{N}$ *and every neighbourhood* U *of* x_n*, there is a* $m \geq n$ *such that* $y_m \in U$*. Prove that* $x = y$*.*

Exercise 2. *Let* $f : X \to Y$ *be a function between topological spaces which is* ***locally open****, meaning that for every point* $x \in X$ *there exists a neighbourhood* U_x *of* x *such that* $f|_{U_x} : U_x \to Y$ *is an open map. Prove that* f *is an open map.*