Let $f(x_1, \dots x_k)$ be a polynomial over $\mathbb{R}[[t]]$. If f has a zero modulo (t^n) for every n then f has an actual zero in $\mathbb{R}[[t]]^k$. The notion of *extremality* may be seen as a generalization of this fact to arbitrary valued fields. A valued field K is extremal if the values of every polynomial $f(x_1, \dots, x_k)$ over K reaches a maximum (possibly $\infty = v(0)$) when evaluated at tuples from the valuation ring.

Henselian valued fields were expected to be extremal, when residue characteristic is 0. We present a hands on account of how this expectation fails and provide a surprising classification theorem for extremal valued fields.