Problem 1. Show that a path-connected space is weakly equivalent to a product of Eilenberg-MacLane spaces if and only if it admits a Postnikov tower of principal fibrations with trivial $k$-invariants (all of them).

Note. Here, we follow Hatcher’s convention that the $k$-invariants are used to build the Postnikov tower of $X$ starting from $P_1X$ and not $P_0X$. In other words, by “Postnikov tower of principal fibrations”, we mean that the maps $P_nX \to P_{n-1}X$ are principal fibrations for all $n \geq 2$. Using $n \geq 1$ instead would force $\pi_1X$ to be abelian.