HOMEWORK SET 3

HW1. Prove that every finite based CW complex X has the following property: *for every based CW complex Y, the maps $[\Sigma^n X, \Sigma^n Y] \to [\Sigma^{n+1} X, \Sigma^{n+1} Y]$ are isomorphisms for all sufficiently large n.*

(Hint: Prove the result by induction on the number of cells. Use the Puppe sequence associated to $S^k \xrightarrow{\phi} X \to X \cup_\phi e^{k+1}$, and the five lemma.)

HW2. Calculate the cohomology ring of the homotopy fiber of the map $\mathbb{CP}^n \to \mathbb{CP}^{n+1}$.

Deadline: 2025–11–06. If you have used any resources outside the course literature/lecture notes, please indicate this in your solution. Similarly if you have discussed the problems with another student, or used AI. Hand in your solutions by e-mail to: dan.petersen@math.su.se