Mathematisches Institut | Universität zu Köln
Prof. Dr. Sabatini | 22.05.2019

Algebraic Topology – Homework 8

Due date : May 29th in class.

Exercise 30. (16 Points)

Let X be a topological space endowed with the structure of a CW complex. Prove that $H_n(X^n)$ is a free abelian group for every n. (Here X^n denotes the n-skeleton of the CW complex.)

Exercise 31. (8+10 Points)

Let X^1 be the wedge of two circles $S^1 \vee S^1$, where one circle is labeled by a, and one by b.

(i) Let X be the two-dimensional CW complex obtained by attaching a 2-cell to X^1, where the attaching map is $ab^2a^2b^2a^{-1}b^{-1}$. Compute the (cellular) homology of X.

(ii) Let Y be the two dimensional CW complex obtained by attaching two 2-cells to X^1, with attaching maps respectively given by a^5b^{-3} and $b^3(ab)^{-2}$. Compute the (cellular) homology of Y.

Exercise 32. (16 Points)

For SX the suspension of X, show by a Mayer-Vietoris sequence that there are isomorphisms $\tilde{H}_n(SX) \cong \tilde{H}_{n-1}(X)$ for all n.