# HOMEWORK 7 – 2017

**Exercise 1.** Let $f : X \to Y$ be a constant map. Prove that $f_* : H_n(X) \to H_n(Y)$ and $f^* : H^n(Y) \to H^{(}X)$ are zero maps for $n \geq 1$. (Hint: One can do it from the definition, but much easier is to factor $f$ as a composition of suitable two maps and use the fact that $H_*$ and $H^*$ are a functor and a cofunctor, respectively.)

**Exercise 2.** Let the cohomology rings of the spaces $X$ and $Y$ are the following

$$H^*(X) \cong \mathbb{Z}[x]/\langle x^n \rangle, \quad H^*(Y) \cong \mathbb{Z}[y]/\langle y^m \rangle$$

where $x \in H^1(X)$ and $y \in H^1(Y)$. Prove that

$$H^*(X \vee Y) \cong \mathbb{Z}[u, v]/\langle u^n, v^m, uv \rangle.$$