Exercises for Algebraic Topology I – Sheet 2

Uni Bonn, WS 2018/19

Aufgabe 5. Compute the abelian group $K_0(\mathbb{Q}[\mathbb{Z}/2])$.

Aufgabe 6. Let $i\colon H \to G$ be the inclusion of finite groups and let R be a ring. Prove or disprove that for every RH-module M its induction i_*M and its coinduction $i_!M$ are RG-isomorphic.

Aufgabe 7. Let $f\colon H \to G$ be a group homomorphism. Show that the functor from the category of RH-modules to the category of RG-modules given by coinduction with f is exact if and only if $\ker(f)$ is finite and $|\ker(f)| \cdot 1_R$ is a unit in R.

Aufgabe 8. Let p be a prime number and let X be a compact $\mathbb{Z}/p$-CW-complex. Show that X and $X^{\mathbb{Z}/p}$ are finite CW-complexes and prove for their Euler characteristics

$$\chi(X) \equiv \chi(X^{\mathbb{Z}/p}) \mod p.$$

handover on Wednesday, 23.10 in the lecture