

Homework number 1

Do the exercise 1 and one of the exercises 2 and 3.

We have a short exact sequence of chain complexes

$$0 \rightarrow A_* \xrightarrow{i} B_* \xrightarrow{j} C_* \rightarrow 0.$$

In the lecture the boundary homomorphism $\delta : H_n(C) \rightarrow H_{n-1}(A)$ has been defined.

Exercise 1. Prove that its definition is correct.

Exercise 2. Prove that the long exact sequence of homology groups

$$\cdots \rightarrow H_n(A) \xrightarrow{i_*} H_n(B) \xrightarrow{j_*} H_n(C) \xrightarrow{\delta} H_{n-1}(A) \rightarrow \cdots$$

is exact in the term $H_n(B)$.

Exercise 3. Prove exactness in the term $H_n(C)$.