**Cohomology of Groups — Exercise Sheet 12** | **TU Kaiserslautern**

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**Exercise 1**

Let $G$ be a finite group. If $A$ is a $\mathbb{Z}G$-module which is induced from the trivial subgroup, then $H^n(G, A) = 0$ for every $n \geqslant 1$. Deduce that $H^n(G, A) = 0$ for every $n \geqslant 1$ if $A$ is a projective $\mathbb{Z}G$-module.

**Exercise 2**

Prove that $H^n(G, \mathbb{Q}/\mathbb{Z}) \cong H^{n+1}(G, \mathbb{Z})$ for all $n \geqslant 1$.

[Hint: use an argument similar to the one used in the proof of Lemma 34.4.]

**Exercise 3**

Prove that if $G$ is a finite cyclic group, then $M(G) \cong 0$.

[Note: there are several possible approaches using results seen in the lecture so far.]