Preview: What is a good first step to understand $\mathrm{Ext}^1_A(X,Y)$ better?

In §1 we learnt that $\mathrm{Ext}^1_A(X,Y)$ is an abelian group in an explicit, but rather complicated way. We still do not know how to compute examples, and we do not even know which examples can be expected to be accessible. Therefore we will in this chapter look at an easier question: When is $\mathrm{Ext}^1(X,Y)=0$? This is still too complicated, since it depends on X and on Y.

$\rightsquigarrow$ When is $\mathrm{Ext}^1(X,Y)=0$ for all Y? This depends only on X.

When is $\mathrm{Ext}^1(X,Y)=0$ for all X? This depends only on Y.

We will be able to determine precisely the classes of such X or such Y, respectively. The results also will provide a starting point for attacking the general question how to compute $\mathrm{Ext}^1(X,Y)$ (not yet in this chapter).

This chapter is quite different and fairly independent from the previous one – no pullbacks or pushouts, no diagram chasing, but many modules and some linear algebra.