

Auslander–Reiten theory

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Jan Schröer's lecture notes should be a perfect reference.

In this talk, we dive into the huge forest of Auslander–Reiten theory.

	Last time	This time
Central concepts	quiver rep	ind rep & AR quiver
Proofs	relative easy	most skipped
Goal	comprehend	enjoy

Review

Exercise

Q :



$$I = (ab - cd)$$

Compute $\text{Ext}_{KQ/I}^i(S(1), S(4))$

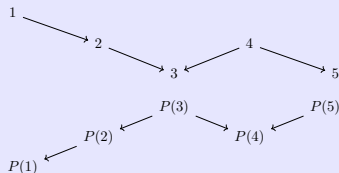
Definition

$$\underline{\dim} M := (\dim_K M_i)_{i \in v(Q)} \quad \text{for } M \in \text{mod}(KQ/I)$$

Process

- Find more representations.
 - knitting process
 - introduction to root system
 - relations among indecomposable representations
(Compute Hom , ker , coker in a fancy way)
 - starting function
- From Dynkin quiver to affine quiver.
 - new root system
 - tube
 - other cases

E.g. A_5 $1 \xrightarrow{a} 2 \xrightarrow{b} 3 \xleftarrow{c} 4 \xrightarrow{d} 5$



Exercise

$a: i \rightarrow j \implies f^a: P(j) \rightarrow P(i)$ is unique up to (nonzero) scalar.