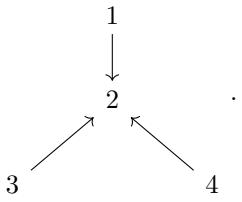
Representation Theory of Finite-Dimensional Algebras
NMAG442

Exercise session 6—May 5, 2023

We work over an algebraically closed field k and with finite-dimensional modules.

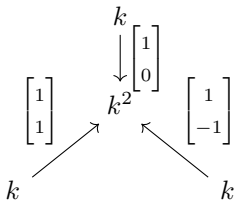
Reflection functors, Coxeter functor and roots.

Exercise 1. Consider the following orientation of the Dynkin diagram D_4



a) Compute $\sigma_2(\underline{\dim} P_1)$ and $S_2^+(P_1)$ an then iterate with sinks $1, 3$ and 4.

b) Given the represetnation X:



Compute $\sigma_2(\underline{\dim} X)$ and $S_2^+(X)$ an then iterate with sinks $1, 3$ and 4.

Exercise 2. Consider the following representation X of the Kronecker quiver:

$$k^2 \underset{\psi}{\overset{\varphi}{\rightrightarrows}} k^3$$

where φ is the inclusion on the first two coordinates, ψ is the inclusion on the last two coordinates and vertices are labelled from left to right. Compute $\sigma_2(\underline{\dim} X)$ and $S_2^+(X)$.

Exercise 3. Find a root of the Dynkin diagram E_6 which has a number 3 in one of its components. Choose an orientation of the diagram and describe the corresponding indecomposable representation of the resulting quiver.

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