

$$\cdot \rightarrow \cdot \leftarrow \cdot \leftarrow \cdot$$

Quiver of type A_3

$$\cdot \curvearrowright$$

1-loop quiver $L(1)$

$$\cdot \rightrightarrows \cdot$$

2-Kronecker quiver $K(2)$

$$Q: 1 \rightrightarrows 2$$

$$M_\lambda: K \xrightleftharpoons[\lambda]{1} K$$

$(\lambda \in K)$

$$\text{Hom}_{KQ}(P(1), M_\lambda) = ?$$

$$\text{Hom}_{KQ}(S(1), P(1)) = ?$$

$$\text{Hom}_{KQ}(M_\lambda, M_\mu) = ?$$

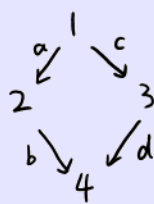
Let V be a K -linear space of finite dimension.

$$\Phi(V): V \xrightarrow{\text{Id}_V} V \xrightarrow{\text{Id}_V} V \text{ be a rep of quiver } Q: \cdot \rightarrow \cdot \rightarrow \cdot$$

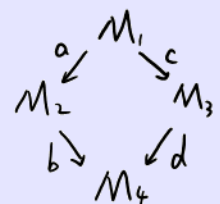
What is the subrepresentation of $\Phi(V)$?

$$\text{Flag}_3(V) = \{0 \subseteq V_1 \subseteq V_2 \subseteq V_3 \subseteq V \mid V_1, V_2, V_3 \text{ subspace}\}$$

$Q:$

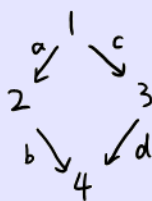


$$M \in \text{mod}(KQ/I):$$



$$\text{where } boa = doc$$

$Q:$



$$I = (ab - cd)$$

$$P(1) = I(4)$$

$$\text{rep}(Q) \longrightarrow \text{mod}(KQ)$$

$$(V_i, V_a) \longmapsto \bigoplus V_i$$

$$a \in Q, c \in KQ: \bigoplus V_i \xrightarrow{\pi_{s(a)}} V_{s(a)} \xrightarrow{V_a} V_{t(a)} \xrightarrow{l_{t(a)}} \bigoplus V_i$$

$$(e_i W, a \cdots e_{s(a)} W \rightarrow e_{t(a)} W) \longleftarrow W$$