Definition (Graph homomorphism)
Given graphs $\mathcal{G} = \langle \mathbf{V}, \mathbf{A}, \mathrm{src}, \mathrm{tgt} \rangle$ and $\mathcal{G}' = \langle \mathbf{V}', \mathbf{A}', \mathrm{src}', \mathrm{tgt}' \rangle$, a graph homomorphism $f : \mathcal{G} \to \mathcal{G}'$ is given by maps $f_0 : \mathbf{V} \to \mathbf{V}'$ and $f_1 : \mathbf{A} \to \mathbf{A}'$, such that the following diagrams commute:

$$\begin{tikzcd} \mathbf{A} \arrow[r, "f_1"] \arrow[d, "\mathrm{src}"] & \mathbf{A}' \arrow[d, "\mathrm{src}'"] \\ \mathbf{V} \arrow[r, "f_0"] & \mathbf{V}' \end{tikzcd} \qquad \begin{tikzcd} \mathbf{A} \arrow[r, "f_1"] \arrow[d, "\mathrm{tgt}"] & \mathbf{A}' \arrow[d, "\mathrm{tgt}'"] \\ \mathbf{V} \arrow[r, "f_0"] & \mathbf{V}' \end{tikzcd}$$