

# Seminar Logic and Foundations of Computing

## Homework 3

Sara Roustia, Edward van de Meent

March 4, 2025

**Problem 1.** Show that every colimit can be expressed as a filtered colimit of finite (finitely generated) colimits, viz. given a diagram  $D : \mathcal{D} \rightarrow \mathcal{C}$  with  $\mathcal{C}$  cocomplete and  $\mathcal{D}$  small,  $\text{colim } D$  can be constructed as the filtered colimit of the diagram of all  $\text{colim } D'$ , where  $D' : \mathcal{D}' \rightarrow \mathcal{C}$  ranges over all domain restrictions of  $D$  to finitely generated subcategories  $\mathcal{D}'$  of  $\mathcal{D}$ .