Esercizio 1. The language contains only the binary relations $<$ and e. The theory T_0 says that $<$ is a strict linear order and that e is an equivalence relation. Let $\mathcal{M}$ consists of models of T_0 and partial embeddings. Axiomatize the theory T_1 of rich models. Are all countable models of T_1 rich? (Give a short informal justification.) Does T_1 have quantifier elimination? (Give a short informal justification.)

Esercizio 2. The language contains countably many binary relation symbols r_i. That theory T_0 says that every r_i is a graph. Let $\mathcal{M}$ consists of models of T_0 and partial embeddings. Axiomatize the theory T_1 of the rich models. Are all countable models of T_1 rich? (Give a short informal justification.) Does T_1 have quantifier elimination? (Give a short informal justification.)

Esercizio 3. Let T_0 be the theory axiomatized by T_{lo} and the axiom that says that every point has an immediate successor and an immediate predecessor. Let $\mathcal{M}$ consists of models of T_{lo} and maps that preserve the distance between points. Describe a countable rich model and the theory of rich models. (A short informal description suffices.)