**Exercise 1.** The language contains only a symbol for a binary relation $e$. The theory $T$ says that $e$ is an equivalence relation and that for each $n \in \omega \smallsetminus \{0\}$ there are 2 classes containing $n$ elements.

Most of the following questions have a short answer.

1. Is every countable model of $T$ with infinitely many infinite classes saturated?
2. Is every uncountable model of $T$ with infinitely many infinite classes saturated?
3. Describe a non homogeneous model of $T$.
4. Sketch a proof that the theory $T$ has quantifier elimination.
5. Is $T$ countably categorical?
6. Is $T$ categorical is some uncountable cardinal?
7. Is $T$ is complete?
8. What is $\mathrm{acl}(\varnothing)$?
9. Let $\mathcal{U} \models T$ be saturated. If $e(a, \mathcal{U})$ contains 2 elements, what is $\mathrm{dcl}\{a\}$?
10. Let $e(b, \mathcal{U})$ be infinite, what is $\mathrm{acl}\{b\}$?
11. If $b$ is like above, what is the orbit of $b$ under $\mathrm{Aut}(\mathcal{U})$?
12. Is $T$ strongly minimal?