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 (exactly) 2 classes containing n elements.

Most of the following questions have a short answer.

1. Is a countable model of T with 2 infinite classes saturated?
2. Is every uncountable model of T with infinitely many infinite classes saturated?
3. Sketch a proof that the theory T has quantifier elimination.
4. Describe a non homogeneous model of T.
5. Is T countably categorical?
6. Is T categorical is some uncountable cardinal?
7. Is T 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?