1. Let $k \geq 1$ be an integer. Let T denote the set of multisets of size n with t types such that for all $i \in \{1, \ldots, t\}$, the number of elements of the i-th type is a multiple of k, or in other words $k|i$ for each i. What is $|T|$?

2. Let $k \geq 0$ be an integer. Let H denote the set of multisets of size n with t types such that for each $i \in \{1, \ldots, t\}$, the number of elements of the $i-$th type is at least k. What is $|U|$?

Solution: