1. Suppose Alice has a set $A \subset \{1, \ldots, N\}$ and Bob has a set $B \subseteq \{1, \ldots, N\}$.
   Design and implement a secure protocol (in the semi-honest model) which only reveals output of the following operation to Alice: (a) $A \cap B$, (b) $A \cup B$, (c) $A \setminus B$.

2. Find out as many ways as possible to break the protocols from exercise 1 in the malicious model.