Exercise 1 - Weakest failure detector

Show that $P$ is the weakest failure detector for Group Membership.

Note: the failure detector $D$ is weakest for solving some problem A (e.g., Consensus or NBAC) if D provides the smallest amount of information about failures that allows to solve A.

Hint: Reduce Group Membership to Perfect Failure Detector and vice versa.
Exercise 2 - Properties of VSC with Joins (1/2)

The view-synchronous communication (VSC) abstraction presented in class does not allow joins of new processes.

Answer to the following questions:

1. Why are the properties of VSC (as given in the class) not suitable for accommodating the joins of new processes?
2. Change the properties of VSC, so that they allow for implementations that support the joins of new processes.

Assume that these implementations already provide the events \(<Join|p>\) and \(<JoinOK>\) and focus solely on the properties.

Hint: focus on the properties of group membership.
Exercise 3 - VSC with Joins (Bonus)

Implement joins on the Consensus-based algorithm (Algorithm II) of VSC.