Distributed Algorithms

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GM & VSC
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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?

Exercise 2 - Properties of VSC with Joins (2/2)

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.