HW2 Assignment (20 pts)

Please send your solution to Jana Kostičová. The deadline is **30.5.2026 23:59:59**.

Assume the AIS2 backend is implemented using a strict microservice architecture, where each service has its own database. Choose one real subsystem of AIS2 (based on your knowledge of AIS2) and do the following:

1. Model it using **at least** 4 microservices (optimally up to 6), each representing a single clear business responsibility. The resulting design should demonstrate high cohesion, loose coupling, and avoid unnecessary oversplitting of responsibilities.

   For each service:
   - describe its responsibility
   - describe data it manages (as a list of entities)
   - describe communication relationships:
     - which services it communicates with
     - direction and brief semantics of the communication (e.g. “check schedule conflicts”), type of communication:
       - API call (synchronous)
       - message/event (asynchronous)

       (no need to define technical protocols or message formats)

2. Identify 3 **consistency** issues observable in the subsystem

   For each issue:
   - describe a concrete AIS2 user scenario where this issue would arise (based on GUI behavior)
   - explain why it occurs in a distributed microservice system
   - discuss possible solutions or mitigations, choose the most appropriate one and justify why

3. Discuss whether horizontal scalability provided by microservice architecture would be beneficial for your chosen subsystem and specify scalability requirements for each microservice. Justify your answer using your knowledge of problem domain:
   - expected workload characteristics (e.g. number of users, peak load scenarios)
   - read / write intensity of operations
   - service-specific load differences

   (no need to mention particular technical solution)

Note: This is each student’s own independent work. Collaboration between students and the use of AI tools to generate any part of the solution are not allowed. Violation of this rule may result in zero points for this assignment and referral of the case to the disciplinary committee of FMFI UK. You may also be asked to explain your solution in person.