Summer Semester 2018 **Part Prof. Wanner**	No. of pages: 7 Page no.: 1
Examination: Software Engineering 2	Time: 120 min
Aids: One double sided sheet A4, simple calculator	Semester: ST
Name: First name:	Matricul.-No.:

Note: The area left blank on the sheets usually is sufficient for the answer of the questions in terms of catchwords and/or for the solutions. Therefore write your name, semester and your matriculation number on each sheet and use these sheets for the delivery of your answers and solutions.

The stated points for each exercise are tentative and are subject to change.

Exercise 1 (10 Points)

a) What are reasons to use Maven instead of Ant for Build Management?

b) What are reasons to use Gradle instead of Maven for Build Management?

c) What are reasons to do continuous integration in the Cloud.

Exercise 2 (14 Points)

a) What is the principle “Convention over Configuration”? What is the reason why this principle is applied in many frameworks today? Give also an example where this principle is NOT used.

b) What is the principle “Favour Composition over Inheritance”? What are the reasons to apply this principle? Give an example where Composition is better than Inheritance. Name also a pattern of the “Gang of Four” that uses this principle

c) What is “Conways Law”? Give an example. What does that mean for your organization if you want to implement micro-services?

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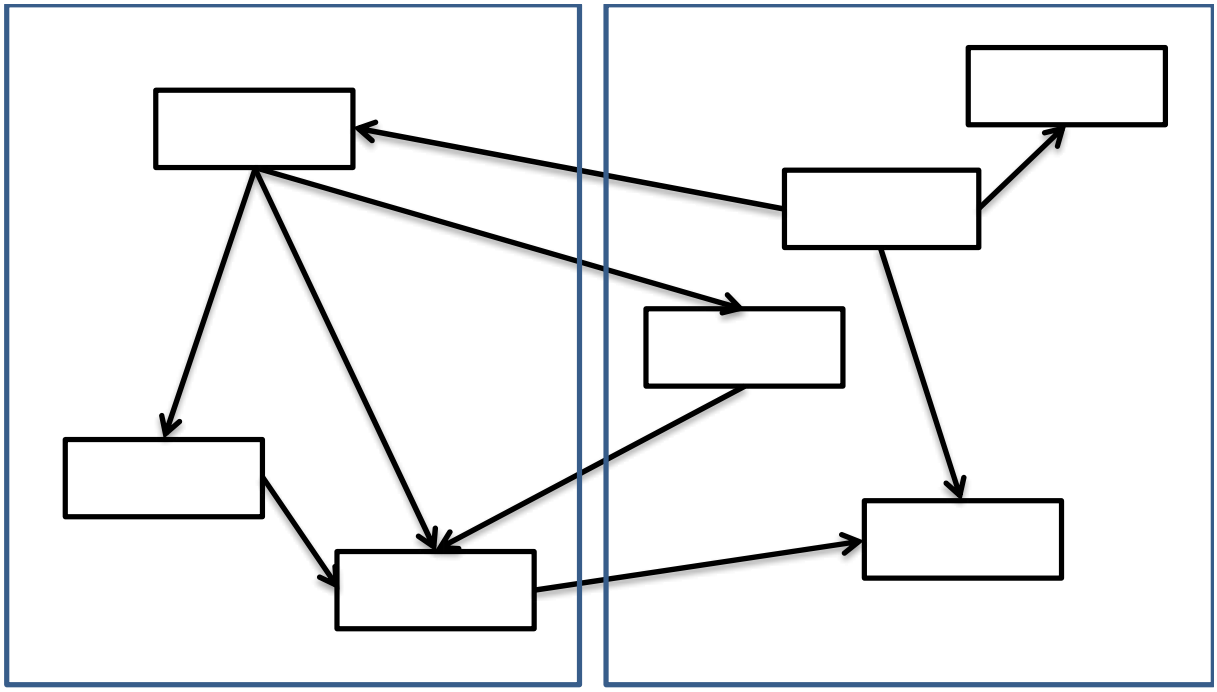
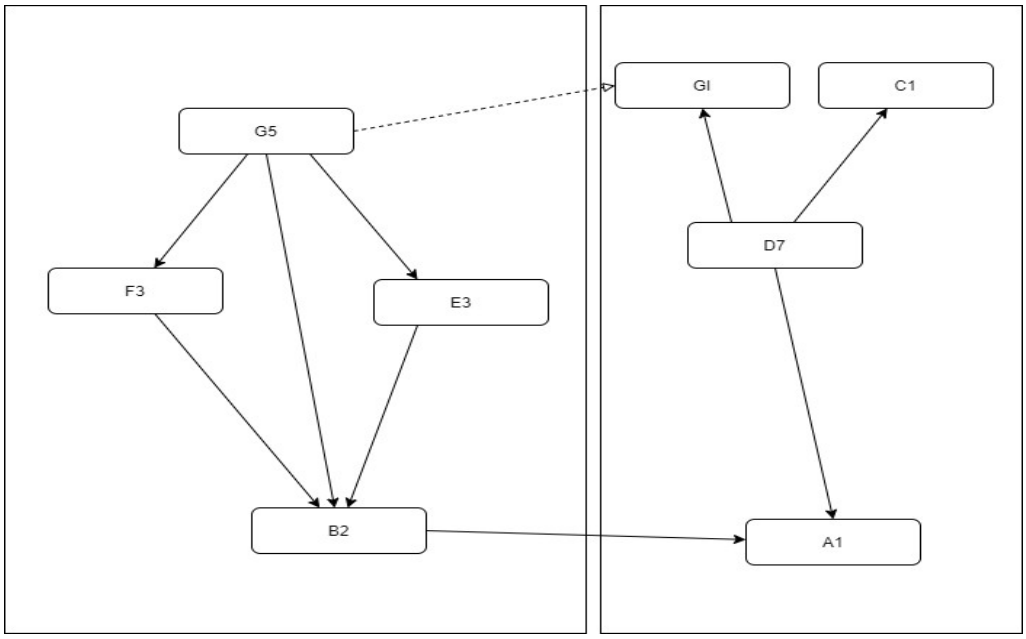
Exercise 3 (20 Points)

a) Given is the following dependency graph of a system with two subsystems. Calculate the CD (Component Dependency) of all components and also calculate the CCD and the ACD.

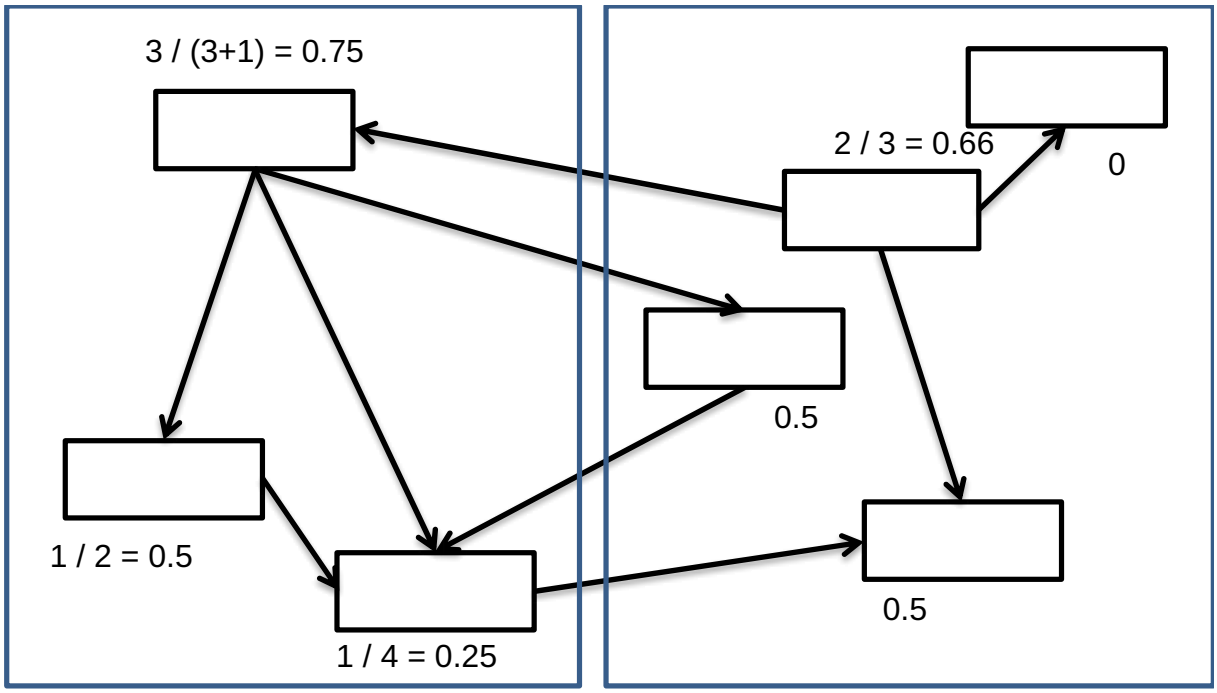


b) Optimize the system by **decoupling** the two subsystems **and** eliminate the cycles.



c) Calculate the CD, the CCD and ACD of your solution for b) (treat interfaces like classes).

d) Use the dependency graph from part a). Calculate the Instability (metric from Robert C. Martin) for each class. Mark the most problematic class in the diagram and explain why you marked it!



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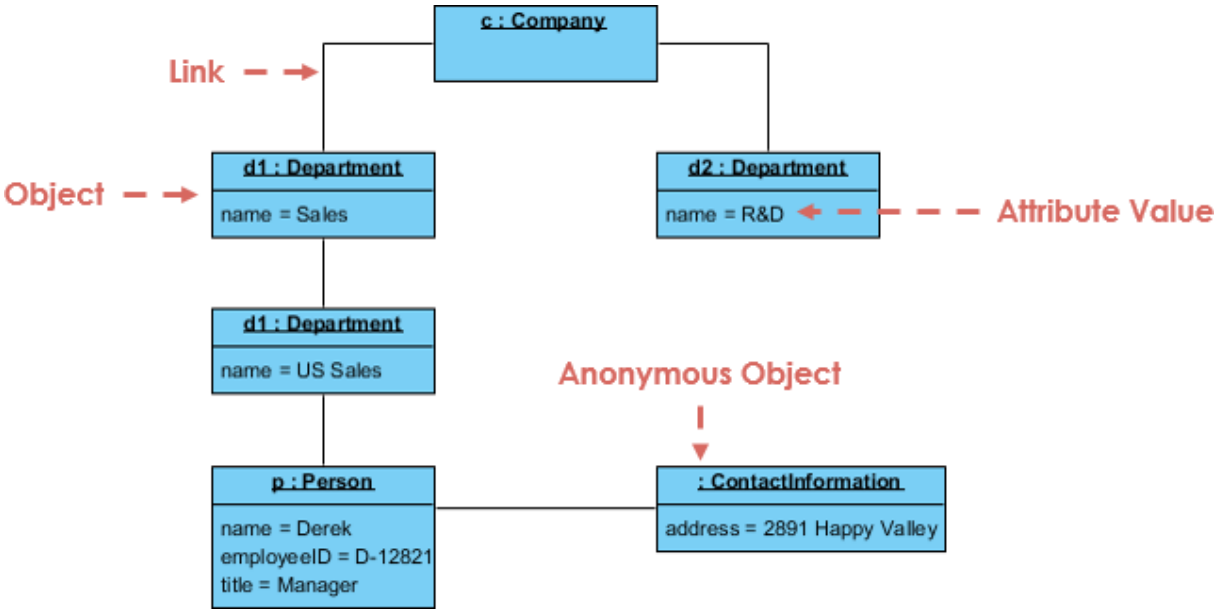
Exercise 4 (16 Points)

a) Draw the metamodel for the following UML-model (Object diagram). Only include the necessary parts!



b) Explain the following terms related to MDSD: Platform independent model, Platform specific model, Meta Object Facility, UML profile?

c) What are the three conditions that must be fulfilled to allow accessibility of a type in Java 9 and later (Jigsaw)?