Summer Semester 2019 **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 is the main difference between Maven build.xml and Build.gradle script?

b) How do you add Gradle dependencies? Give a short example.

c) In which programming language should one develop plugins for Gradle?

d) What is the Gradle build language?

Exercise 2 (11 Points)

a) Explain “Evolvability” in the Values System of Architectural Principles. What does this mean for the structure of your software? What does “Evolvability” mean for the cost of a feature to implement?

b) What is the principle “Law of Triviality”? What are examples for that law in software development?

c) What is the “Boy Scout Rule”? Give 4 examples.

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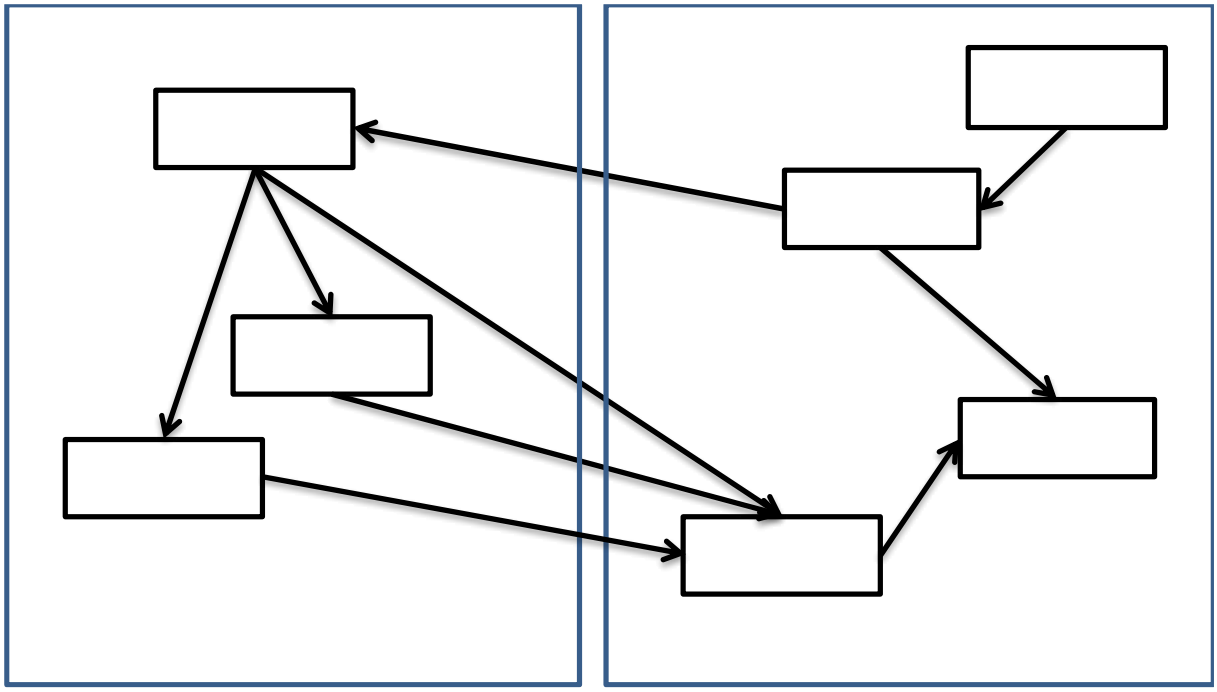
Exercise 3 (20 Points)

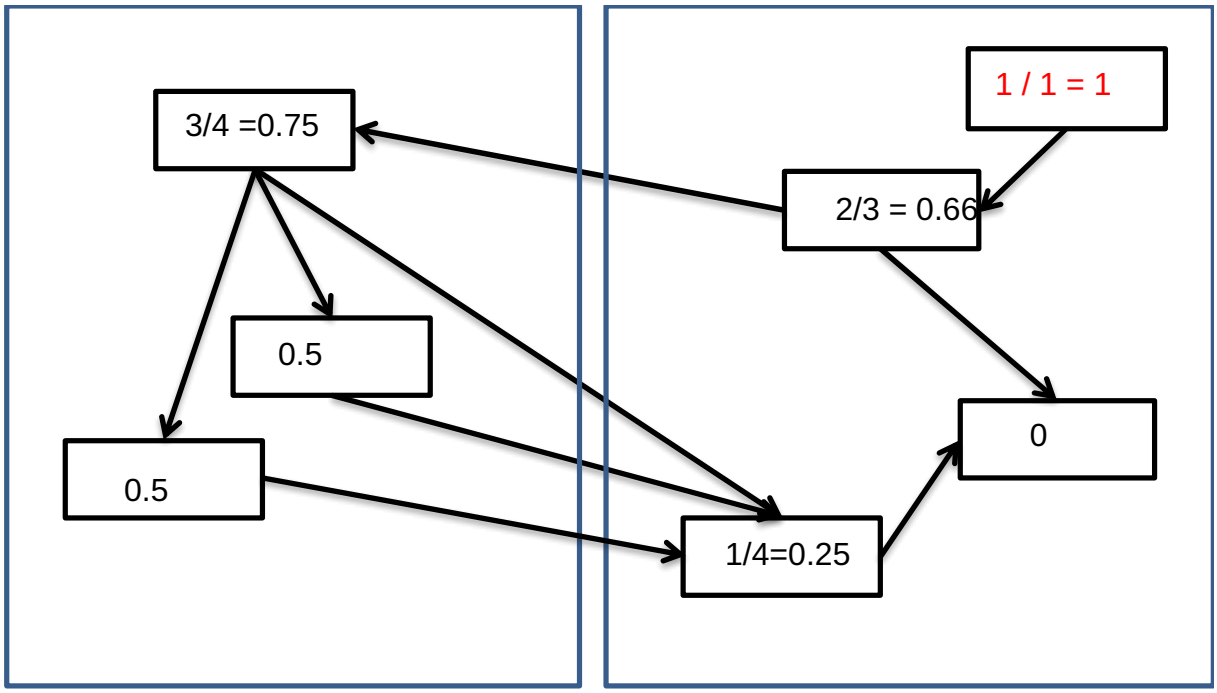
a) Given is the following dependency graph of a system with two subsystems. Calculate the CD (Component Dependency) of all components and also calculate the CCD and the ACD.



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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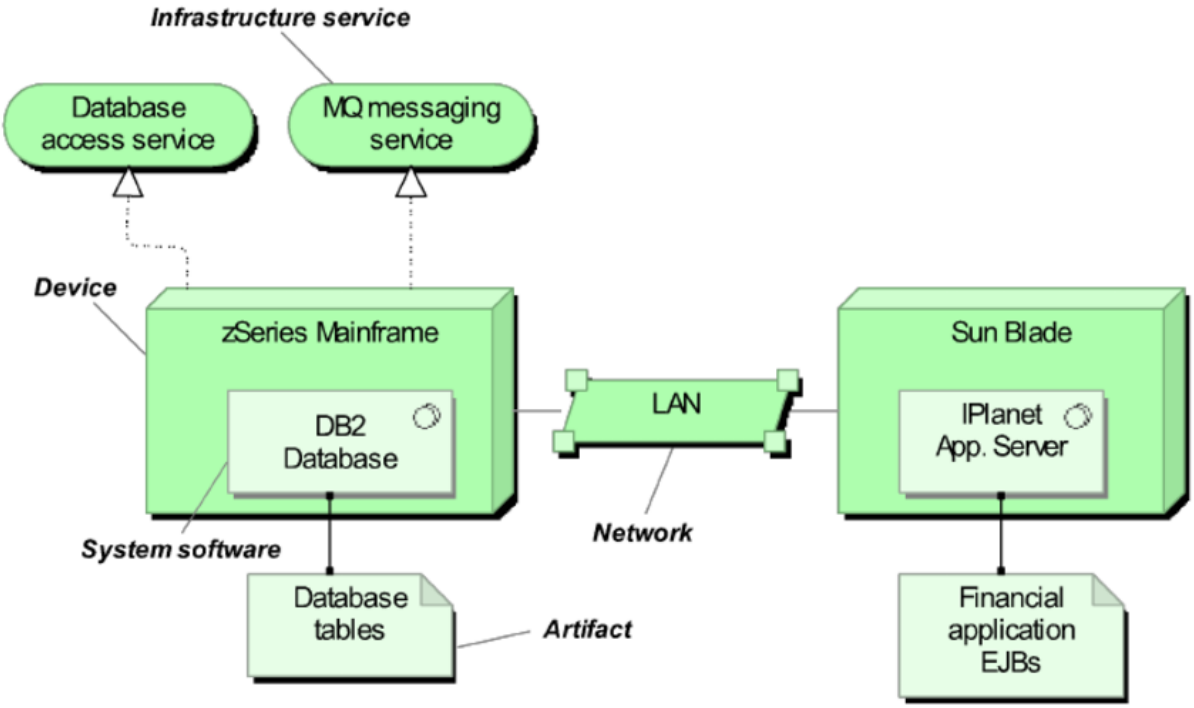
Exercise 4 (19 Points)

a) Draw the **metamodel** for the following Archimate-model (Technology layer example model). Only include the necessary parts!



b) Up to Java 8 there were several problems with the way Java resolves dependencies using the classpath. Explain the following problems:

- Unexpressed Dependencies

- Transitive Dependencies

- Shadowing

- Version Collisions