

Name: _____ Registration-Nb.: _____

Task 1 Software Development Processes

1.a Describe the Waterfall Model and discuss for what kind of projects it is suitable and for what kind of projects problems with this model are expected
[3 points]

1.b What is the important characteristic of object oriented process models?
[2 points]

1.c Describe the tasks of the customer and developers concerning the “User stories” in Agile Methods during the “Planning Game”
[2 points]



Task 2 Requirements Analysis

2.a Check, if the requirements are functional or non functional (required constraints)

[3 points]

Requirement	functional	Non functional
The user enters his account number		
The administrator edits customer data		
The system should process 10,000 queries per hour		
The customer would like to know, if a car in his wished category is available		
The customer adapts his User Interface		
The system should run on Windows XP and on Linux		

2.b Are <<include>>- and <<extend>>-Relationships in Use-Case-Diagrams necessary? Explain your answer.

[2 points]



Task 3 UML Diagrams

3.a Add the missing associations

[3 points]

Class diagram 1	Class diagram 2	Class diagram 3
<p>B has 2 or 3 A</p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 20px;">A</div> <div style="border: 1px solid black; padding: 5px;">B</div> </div>	<p>F is a R</p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 20px;">F</div> <div style="border: 1px solid black; padding: 5px;">R</div> </div>	<p>C and D have a relation</p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 20px;">C</div> <div style="border: 1px solid black; padding: 5px;">D</div> </div>

3.b Create an object diagram representing the following facts

[2 points]

An object **b** of the class **M** is associated with an object **f** of the class **W** and is associated with an object **r** of the class **W**.



Task 4 Design Pattern – General

4.a Which of the following statements describe the characteristics of Design Pattern (more than one answer could be selected)?

[1 point]

1. Design Pattern try “to separate the things that change from the things that remain the same.” ☐
2. Design Pattern represent a complete idea within a program. ☐
3. A Design Pattern is an effective implementation of a problem. ☐
4. A Design Pattern can encapsulate actions or processes. ☐

4.b Choose four Design Pattern and assign them to the appropriate category:

[2 points]

Creational	Structural	Behavioural

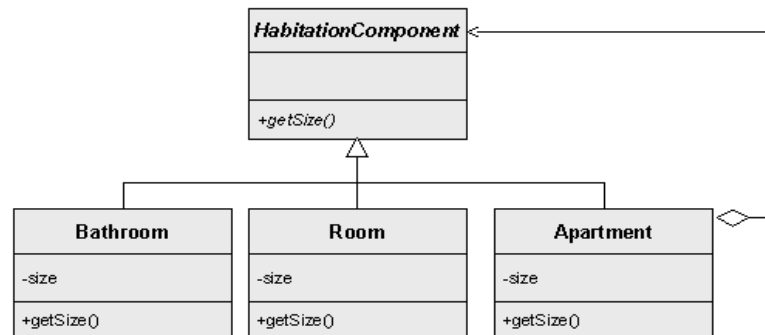
4.c Describe the intent and the motivation for the Design Pattern "Abstract Factory"

[2 points]



Task 5 Design Pattern – Concrete

Following class diagram is given:



5.a Which Design Pattern is used?

[1 Point]

5.b What is the main difference between the implementations of getSize() in classes Room and Apartment? Write corresponding pseudo code.

[4 points]

5.c Extend the diagram above with a class „Kitchen“.

[1 point]

5.d In the class diagram, indicate which component takes which role in the design pattern. Use the generic pattern names for roles.

[2 points]

