Exercise 7 – Object-oriented Design

1. Design Patterns

a) What are the origins of Design Patterns (DPs)? Are they widely used in this field?

b) For the following Design Patterns,
-provide a brief description on your own words
- describe how you would implement those in Java
- describe the advantage of using the Design Pattern

AbstractFactory, Singleton, Bridge, Adapter, Façade, ChainOfResponsibility

c) Which other patterns than design patterns exist in computer science? Provide a short description.

d) Answer the following questions:

(1) Would you use Design Patterns, or not? Why?
(2) Have you ever used Design Patterns without knowing it?

2. Exception Handling & Design by Contract

a) Implement a class BankAccount with the methods withdraw and deposit. Which inputs, internal states may cause an error? Describe.
b) For both methods, implement exception handling.
c) Implement Design by Contract for the class BankAccount.
d) What is the difference between Exception Handling and Design by Contract? Which concept would you prefer for your software? Why?

3. Self-Assessment

Please answer the following questions:

(1) Describe the concept of Design Patterns.
(2) Describe the concept of Design by Contract. How can you implement it in Java?