



## WS2019/20 – Design Patterns and Frameworks

# Frameworks

Professor: Prof. Dr. Uwe Aßmann  
Lectuer: Dr.-Ing. Sebastian Götz  
Tutor: Dr. rer. nat. Marvin Triebel

### Task 1 Framework Hook Fundamentals

This exercise focuses on the *framework hook patterns* introduced by Pree [1] and extended in the lecture.

- a) Enumerate the framework hook patterns introduced in the lecture?
- b) Classify these framework hook patterns with respect to whether they foster *black-box*, *gray-box*, or *white-box* reuse?

### Task 2 The Log4J Framework

*Log4J* is a *Java*-based logging framework supporting powerful logging statements.<sup>1</sup> The framework's architecture<sup>2</sup> revolves around different kinds of *Loggers* that use multiple *Appenders* to *Layout* logging messages.<sup>3</sup>

- a) Investigate the relation between the interfaces **Appender** and **Layout**. Which framework hook pattern can be identified?
- b) Investigate the relation between the interfaces **Logger** and **Appender**. Which framework hook pattern can be identified?
- c) Following the identified hooks: Is *Log4J* rather a *black-box* or a *white-box* framework?

---

<sup>1</sup><http://logging.apache.org/log4j>

<sup>2</sup><https://logging.apache.org/log4j/2.0/manual/architecture.html>

<sup>3</sup><https://logging.apache.org/log4j/2.0/log4j-core/apidocs/index.html>

## Task 3 The JavaFX Framework

The *JavaFX* framework<sup>4</sup> [2] is a state-of-the-art framework for the development of interactive user interfaces supporting both classic 2D applications as well as 3D applications. The core concept of this framework revolves around scenes modeling the user interface, events describing user interactions, and effects transforming elements in a scene.

- a) Look at the core classes in `javafx.scene` and their relationships. Identify at least one framework hook pattern?
- b) Look at the core classes in `javafx.event` and their relationships. Identify at least one framework hook pattern?
- c) Following the identified hooks: Is *JavaFX* rather a *black-box* or a *white-box* framework?

## References

- [1] Wolfgang Pree. Essential framework design patterns. *Framework*, 2:1–7. URL <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.28.5510&rank=1>.
- [2] Kim Topley. *JavaFX Developer's Guide*. Pearson Education, 2010.

---

<sup>4</sup><https://docs.oracle.com/javase/8/javafx/api/overview-summary.html>