TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Computer Science Institute of Software and Multimedia Technology, Software Technology Group

WS2019/20 − Design Patterns and Frameworks

Tools and Materials

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Task 1 Tools and Materials Fundamentals

This exercise focuses on the *Tools and Materials* metaphor introduced by Züllighoven et al. [2] and discussed in the lecture.

  a) Explain the terms *Leitmotif* (Leitbild), *usage model* (Benutzungsmodell), and *design metaphor* (Entwurfsmetapher). What are the relevant instances in the context of the tools and materials approach?

  b) How do *tools* use *materials*? What is the design pattern [1] utilized to couple tools and materials, denoted *connection pattern* [2]?

  c) What are the parts a tool consists of? How is the communication between these parts organized? What is the benefit of this separation?

  d) Explain the *layers* in an application built following the tools and materials approach. What constraints must be enforced regarding *communication* and *generalization*?

Task 2 Homework for Yourself

As homework for yourself, consider the *Integrated Development Environment* (IDE) you are using, e.g., *Eclipse*[1] or *Intellij IDEA*,[2] as an instance of the tools and materials approach. Investigate how an IDE facilitates a useful workbench to programmers.

  a) Investigate your IDE and enumerate the materials the IDE allows you to work on, for instance, *source code*.

  b) Investigate the tools your IDE provides to work on these materials. Are there tools that do not work on a material?

  c) Is there a dedicated *Tool Coordinator* and how are new *tools* registered?

  d) Finally, classify the *Debugger* as a tool. What are the materials it is working on?

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[1]https://www.eclipse.org/downloads/
[2]https://www.jetbrains.com/idea/

References

[1] Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides. *Design patterns: Elements of Reusable Object-Oriented Software*. Pearson Education, 1994.

[2] Heinz Züllighoven et al. *Das objektorientierte Konstruktionshandbuch nach dem Werkzeug & Material-Ansatz; dpunkt-Verlag*. dpunkt.lehrbuch. dpunkt, 1998. ISBN 978-3-932588-05-1.