SOFTWARE ENGINEERING

Exercises

Summary

This document contains the exercises that support the lecture Software Engineering.

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1 Exercise 1: Good preparation is everything!

> *"In a mature software development organization, much of a software engineer's life is spent in meetings, discussing **requirements**, planning, evaluating software products [...], **documenting** and **reporting**."*
> *[Conn, R. in IEEE Software, No. 5, 2002]*

1.1 Task 1: Software? Processes?

By now you have learned a bit about process models.

a) In which phases of the software life cycle is software created?

b) Discuss the three basic models "Sequential/Waterfall," "Sashimi," and "Incremental" regarding the required competences of the development team, the scope of projects and the requirements for projects. What do they have in common, how do they differ?

1.2 Task 2: Tools check

In addition to your head, paper and pencil, you will also need and use a few tools for the following exercises, namely:

- Word processing: MS Word, alternatively: LibreOffice Writer, Google Docs
- Flow charts: MS Visio, alternatively: MS PowerPoint, Google Slides, LibreOffice Impress, **Miro**, Collaboard, **draw.io**, or any other drawing program
- List creation, diagrams: MS-Excel, alternatively: LibreOffice Calc, Google Sheets
- Process models: V-model project assistant 1.5.8[1]
- Web Browser, Email: Mozilla Firefox, Google Chrome, MS Edge, Outlook, Thunderbird, or any other browser and email client
- Configuration Management Client: TortoiseGIT, alternatively: SourceTree, **GitHub Desktop**
- Mind Maps: Freeplane (FreeMind), alternative: MS Visio, **Miro**, Collaboard
- UML diagrams: MS-Visio, alternatively: ArgoUML, UMLet, plantuml in GitLab, Enterprise Architect, **draw.io**, ...
- Creation of presentations and drawings: MS PowerPoint, alternatively: LibreOffice Impress, Google Slides

a) Check on your computer whether the software mentioned is installed and whether you can run it.[2]

b) Preferably use your own computer. If necessary, install the specified software there.

[1] Portable version available e.g., at https://www.cio.bund.de/Web/DE/ Architekturen -und-Standards/V-Modell-XT/vmodell_xt_node.html .
[2] On the laboratory computers: virtual desktop via https://inf-view.fh-rosenheim.de/ .

1.3 Task 3: Word template

In the project business and in your studies, a word processor is one of your most elementary tools. Using a Word template as an example, you should learn how to use the most important functions of MS Word:

- Structured work with a word processor (Word)
- Creating a Word document template
- Creation of / working with format templates (e.g., chapter, section, ...)
- Indexes: Generate table of contents, outline view, ...
- Manage links: Number figures, code fragments
- Essential tools: Ctrl-C, Ctrl-V, Ctrl-X, Ctrl-Z

a) Create a Word document as a template – for example – for a report. The document should have the following properties:

- Cover sheet (title, student)
- Table of contents (chapters with page numbers)
- Numbered pages in the footer (no numbering on the cover sheet!)[3]
- The following numbered main chapters:

  1. **Summary**
  2. **Tools**
  3. **Remarks**

b) Working with the template

What do you think, what is software and what does software engineering mean? To do this, write a few sentences under Chapter **1. Summary** and insert any image (gif, jpg, png, ...) there. Create a caption for this figure, including a figure number.
Describe the figure with a short text, in which you refer to the caption. The referencing should be done in such a way that the reference is automatically adjusted if something changes in the figure (number, caption).

c) Extension of the template

On the cover sheet of your report, add a line that indicates where the document is located in the directory structure. The field should be updated automatically.
In addition, add the current date to the footer, this should also be updated automatically.

d) Optional (try it!): Advanced extension of the template

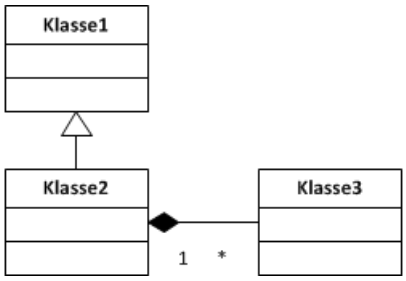
In addition, on all pages – except for the cover sheet – add a field with the title that is on the cover sheet in the header.
The field should be automatically updated if the title on the cover sheet changes.[4]

[3] Note: see also "Different first page" or "Section breaks".
[4] Note: see Create "Bookmark" (on cover page) and "Cross-reference →bookmark" (for header).

1.4 Task 4: Try it out and interact

Use the Word template you created in Task 2 and create a sub-chapter under Chapter **2. Tools for each of the following sub-tasks**.

a) Create the following class diagram with **draw.io** or MS Visio[5]

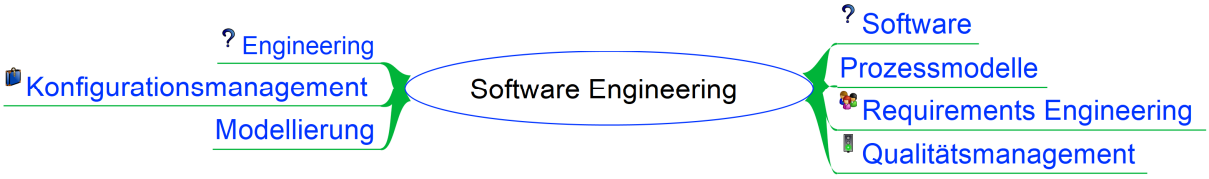


and paste it into the Word document.

b) Start the V-model project assistant and insert a screenshot of the initial dialog window into the Word document.

c) Take a screenshot of TortoiseGIT's (or SourceTree's, **GitHub Desktop**'s) About dialog and paste it into the Word document.

d) Finally, create the following mind map with Freeplane, **Miro**, or Collaboard.



and paste it into the Word document.

[5] Template Category = "Software and Database," Template = "UML Class"