Abgabetermin: 10.11.2016 um 23:59 Uhr

Übungen zur Vorlesung
Software Engineering – WS 16/17

Übungsblatt 03

1. **UML Structure: UML-Klassendiagramm (IntelliPhoto)** (7,5 Punkte)

   Given is the following scenario:

   The new graphics software intellijPhoto is an interactive tool to view and edit images. Each image is represented by a 2D array of bytes, where each byte value represents a color value of the pixel. The user should be able to query the image dimensions. The software can represent two different types of images: "RasterImage" and "ShapedImage", where the latter one is a special form of "RasterImage". A "ShapedImage" has a non-rectangular shape (polygon); the bytes in the array specify whether the respective pixel is transparent or opaque. Furthermore, the software should be able to allow simple image manipulations. This will allow the user to rotate, magnify and reduce images, set new color values in the image, and combine two images into a new image within 0.2 seconds.

   On the basis of this specification, create a suitable class hierarchy as an *UML class diagram*. Specify the exact protocols of eventual classes as well as the attributes that the respective classes must manage. Justify your design decision in a few words! You can use the solution discussed in the second exercise sheet.

2. **Modelling Behavoir: Use-Case Diagramm (IntelliPhoto)** (8,5 Punkte)

   You were asked to implement the new image processing software IntelliPhoto; therefore, you carried out an environmental analysis. In this, you were able to collect valuable information about various beneficial groups. So you learned that casual users and novices want to use the software mainly for short tasks such as image cropping, changing image resolutions, and rotating images. In addition, the casual users want to use the software to retouch certain regions in a picture. Another user group, the freelance photographers, want to have apart from retouching images a set of correction tools, such as "Brightness / Contrast", "Hue / Saturation" and "Gradation Curves" as well as selection tools and different brushes. The last group of potential users, the 3D artists, want an interface for the import of common 3D files. It should also be possible for them to create simple geometric 3D objects directly in the image. Each user group indicated that they could and would use a layer representation in the software.

   Summarize the described results in an *UML-Use-Case-Diagram*.

3. **UML Structure: UML-Klassendiagramm (Unternehmen)** (8,5 Punkte)

   Model a company as a UML class diagram, which has any number of locations worldwide. A location is composed of at least one building including the address. A building has several offices and exactly one cafeteria. The offices have numbers as well as a name plate at the door. There are employees in the offices who are assigned to either the boss, the management or the workforce. Please note that a boss and 3-8 persons from the management as well as at least 5 workers are assinged to one location. The employees are characterized by an ID. The professional groups also have their own tasks: The boss controls the management, which in turn monitors the workers, who in turn do the work. The company produces various products (PCs, laptops, servers).

Information for Submissions

- To submit your solution, create a **PDF-File**, in which your answers as text and figures are stored.
- If you are required to submit a programming task, please send only the source code as plain text file. Source code in a PDF file won't be considered!
- To allow tracing from PDF to the source code file, please reference the source code files in the PDF file.
- For your PDF document, please write your **name** and **student ID (Matrikelnummer)** of each team member.
- Please compress all files into a single zip-file with the following file name (team submission require the data of only a single person):
  `<Family name>-<student ID (MatrikelNr)>-se-blatt<Nb Excercise>.zip`
- Send this file to Philipp Seltmann (**philipp.seltmann@uni-weimar.de**)