Technical University of Denmark
DTU Informatics
Assoc. Prof. H. Baumeister

Spring 2015
Prog. Assignment Nr. 1
February 2, 2015

02161: Software Engineering 1

Some general remarks for the assignments

- There will be *programming* assginments and *regular, non-programming* assignments.
- The programming assignments form the development of one library application (cf. below). I have made available *all* the 6 programming assginments, so that you can go through the programming assignments in your own pace. The other, regular, i.e. non-programming assignments will be given one at a time later during the course.
- The assignements are *not mandatory*; however, it is a good idea to do them, because they focus on techniques important for the final project.
- You can discuss the assginements with me and the teaching assistant during the lab sessions in the E-bar in building 341. Note, that I expect you to also work on the assignments outside of the exercise sessions, i.e. around additional 4–5 hours a week (in addition to the lecture and the exercises).
- You are very welcome to send me the Eclipse projects after you have finished an assginement as a *ZIP* file to me (`mailto:huba@dtu.dk`), to get *feedback* on what you have done. For non-programming assignments you should send me a plain text file or a PDF file with your solution (no Word file please).

A library application

- The goal for the next weeks is to implement parts of the software supporting the management of a public library. The library contains books, DVDs and CDs, and journals. Books, DVDs and CDs can be borrowed from any user registered with the library. Books can be borrowed for a period of at most 4 weeks; DVDs and CDs only for a period of one week; and journals can't be borrowed at all.
- Everyone with a CPR number can register as a user of the library.
- Everyone can search / browse the electronic library catalogue and search/browse for books, DVDs, CDs, journals, and journal articles by title and author. However, only a person who is registered can borrow books and DVDs/CDs. A user can at most borrow 10 books, DVDs or CDs. He can't borrow anything if he has an overdue book, DVD or CD. He can only borrow something again after he has payed a fine and returned the overdue media. It can also happen that a user looses or

damages a book or DVD/CD. In this case he has to pay to the library the price of the lost media so that the library can buy it again. A user of the library can be blocked from borrowing books. This blocking can be undone.

- The librarian can register users and add or delete books, DVDs, CDs, or journals. He can also block and unblock users. He can mark books as missing. The librarian has to be able to register journal copies when they arrive from the publisher and make their articles accessible for searching.
- The librarian can generate reports on the status the library: what is the current number of overdue books; what is the current number of missing books; how often has a certain media been borrowed; how often has a certain media been borrowed that belongs to a certain topic. e.t.c..
- In this implementation, we will focus mainly on implementing the applications functionality without thinking about user interface issues and how to store the data. We will add a command line user interface and a persistency layer in programming assignments 5 and 6.

1.1 Adding books to the library

- The first task is to implement the functionality of adding books to the library. Only the administrator is allowed to do this. The interaction scenario is as follows

  1. Administrator logs in by providing the admin password (it is assumed that the library has only one account)
  2. A new book is created with the appropriate fields
  3. The administrator adds the book to the library.

- If the administrator is not logged in, e.g., because the password was wrong, or because he skipped the log in step, then an exception should be thrown when calling add book.

  1. Administrator is not logged in
  2. A new book is created with the appropriate fields
  3. The administrator adds the book to the library
  4. The library application throws an OperationNotAllowed exception

- Implement login and addBook

  a) Download the library projects zip file from `http://www2.imm.dtu.dk/courses/02161/2015/files/library01.zip`.

  b) Import the zip file as an Eclipse project.

  c) Implement the missing classes and methods, such that all tests in TestAddBook run successfully.

  – Do this by removing one by one the comments on the methods with the @Test annotation. Uncomment only one non working test at a time.

– For each test, implement the required classes (in the *src* folder) and methods to make the test run. The task is done if all tests are uncommented and run.

1.2 Searching for books

The second task is to implement the searching for books. Every user can search for books. The method search returns a list of books for which the given keyword matches a substring of the title or the author.

a) Implement the missing classes and methods, such that all tests in TestSearchBook run successfully.

   – Do this by first removing the comments for the method with the @Before annotation and removing one by one the comments on the methods with the @Test annotation. Uncomment only one non working test at a time

   – For each test, implement the required classes and methods to make the test run. The task is done if all tests are uncommented and run.