Obligatory Exercise INF5150 Autumn 2006

060910

About the obligatory exercise

All project groups have the same exercise. A new exercise is made every year. There are normally 2 drops (specification, design+implementation). The groups will evaluate each other and the lecturers and assistants will also evaluate the projects. All drops will be presented and criticized publicly.

Group formation

The project groups are formed by the course lecturers and assistants. We try and take into account special needs of those that take the course, but only to a limit. Buddies are not supposed to work in the same group.

- The groups are formed randomly, but dividing the students in 2 strata
    - Competent: Students that already has a Master or equivalent
    - Competent: Students that took INF2120 last semester
    - Commoners: everybody else
- Those not present at the spreading will be distributed the groups that have been formed
- If a group detoriates down to only 2 people, we shall seriously consider merging it with another group

Requirements of the work – the groups and the individual

The individual student

- He/she shall participate in a project group
- He/she shall participate on equal terms with the others in the team regardless of whether he/she is a part time student.
- He/she shall be knowledgeable about all details of the common deliverable such that he/she is able to answer detailed questions from the teachers upon special request.
- He/she is asked to withdraw from the course if these demands cannot be met.

The project group

- The project group must set up their own organization
    - There should be one contact person responsible for the communication with the teachers
    - Every person in the group should have some responsibilities and this shall also be documented in the deliverables.
- The project group must accept supervision by the assistants. Some supervision might take place in the exercise hours, while it may also be necessary to make appointments beyond these hours.
- The deliverables have hard deadlines. We do not accept delays. The reason for this absolute rule is that the exams do not move and the groups are dependent

upon each other for the evaluation. We will, however, take into account special incidents that have made the project work more difficult. Be proactive, project work takes longer than you think!

What is cheating?

Cheating has become a problem in general also at universities. We would like to spend as little time as possible controling the students, but we will not hesitate to flunk students that do not adhere to the following simple guidelines:

- The project deliverables cannot be (partly) identical to another group's solutions.
- It is legal to communicate with other groups and reach common solutions on small issues. But please work independently!
- The project deliverables may legally apply results found on the Internet, but such results must always be given a proper reference in the report. (Where was the result found?) Failure to do so is reason enough for flunking the whole project.
- All members of the project team is responsible for the totality of the project.
- Drop 1 must be passed in order to have the right to continue on the Drop 2.

Introduction and Background

This year's obligatory exercise in INF5150 will be based on the project of INF2120 last semester. The reason for this is to let the students start on a higher level, but such that the purpose of the project work is preserved. We hope that the students of INF5150 will obtain the necessary skills in using the tools more easily when they have working prototypes available.

We will give the INF5150 students access to two solutions to the INF2120 project along with the brief evaluation of these solutions by the teachers of INF2120. The solutions are executable such that INF5150 students can experiment with their solutions directly.

None of the INF2120 solutions are perfect. They are not even perfect solutions to the INF2120 project task, but they are good attempts. Furthermore the INF5150 exercise is not identical to the INF2120 task, but similar.

In addition to letting the students stand "on giants' shoulders", basing the INF5150 exercise on the INF2120 one simulates real life where projects seldom start from scratch. Rather new products build on old solutions with additions, modifications and corrections. This is also what we shall do in INF5150 this year.

INF2120 Legacy Resources

- The INF2120 obligatory exercise text
- The INF2120 Spring 2006 FAQ
- INF2120 Group 12 Final deliverables
- INF2120 Group 23 Final deliverables

The INF5150 General Specification of ICU

- The INF5150 exercise demands that ICU should be robust with respect to discontinued services.
- The INF5150 task demands that the solution shall *not* use active polling of the positions. Positioning should only be results of explicit service requests.
- The INF5150 solution should take advantage of hierarchical state machines.
- The INF5150 solution shall use standard creation and destruction of state machines.
- The INF5150 solution may or may not use an Oracle database. The project group must give arguments for their choice of storage strategy.

The INF5150 Special Specifications of ICU

- ICU shall have buddy lists
    - Any user can only position persons within his/her buddy list
    - Any person on a buddy list may withdraw from it at any time
    - Any person on a buddy list must accept inclusion in the buddy list
- ICU shall have hotspots
    - Global hotspots
    - Personal hotspots
    - Possibly hotspots associated with a buddy list (depending on buddy list strategy)
    - Dynamic hotspots – meaning hotspots that move, such as a buddy. But not all buddies shall be considered dynamic hotspots.
- ICU KML-file production shall be triggered by an SMS
    - The kml-file should be generated with a cryptic name and the name sent to the requester on SMS
- ICU shall have a service where an individual is positioned and the position is sent back to the requester on SMS
    - The positioned person must be in the requester's buddy list
    - The position shall be reported relative to the closest hotspot available to the requester, e.g. "Trine is 250 m southeast of Ifi-building"
    - It should be possible to position oneself
- ICU must have some administrative services also to be triggered through SMS:
    - Add a buddy
    - Remove a buddy
    - Remove yourself from the whole system
    - Add or redefine a hotspot (of a specific kind)
    - Remove a hotspot
- ICU shall have an accounting system such that it is possible by means of a request by SMS to see how many different kinds of services the user has performed.
    - Reset accounting (but the total number shall remain)
    - Number of atomic positioning requests
    - Number of kml-file generations
    - Number of positioning request for any given individual

- ICU shall have a privacy option. This means that a user can request information about when he/she is being positioned. This may range from statistics to being notified every n-th time someone positions you.

INF5150 autumn 2006 Drop 1

1. Make an evaluation of the existing legacy base and determine the development strategy.
    a. The evaluation shall describe how the solutions could have been improved in order to make them more unassailable. Consider both intended and unintended challenges to the systems.
    b. The strategy may be to build on one of the two solutions, or to start from scratch and bring in bits and pieces of the available solutions.
    c. NOTE: Be careful not to apply copy/paste from one model to another since the cascading effects are often difficult to foresee. Copy/paste of pure text is not a problem.
2. Provide a detailed specification of the services in terms of UML sequence diagrams and the necessary context in terms of classes and composite structures.
    a. If appropriate, the project groups may also apply use case diagrams and associated prose to define the services.
3. The deliverable shall contain the following:
    a. The UML model (emx-file)
    b. A report containing all information necessary to understand in reasonable detail the solution of the project group. It shall not be necessary for the evaluators to experiment with the model. The report shall also contain the evaluation of the legacy base and the development strategy.
    c. The report shall also identify the responsibilities of the individual project members. A project leader must be identified. The report shall be in pdf format.

Evaluation of Drop 1

- The evaluation is based on the deliverable and on the presentation
- Each group will evaluate another group
- Each project group will present their solution to a plenary session in PowerPoint or Acrobat formats. (To be sent to the teachers in advance)
- The evaluations from peer group, group teachers and lecturers will be given in writing, either on e-mail or comments on a printout.

INF5150 autumn 2006 Drop 2 (to be updated)

1. Make an executable model that implements the specification given in Drop 1
2. Perform a security analysis described in the CORAS tool of your system. Make sure that the analysis covers the aspects that were raised in the evaluation of the legacy.
3. The deliverable should contain
    a. The executable UML model, with state machines, but also with updated sequence diagrams.

b. Complete installation and usage manual for your system.
c. A report explaining all necessary technical features in reasonable detail.

Evaluation of Drop 2

1. Each group will demonstrate briefly their system focusing on what they believe is their special assets and why their system is robust and unassailable.
2. During the evaluation of Drop 2, the evaluating group shall come up with a description of the test context in UML Testing Profile. These tests shall be performed and the results recorded. This testing process shall be briefly explained during the plenary evaluation session.