Software Engineering Project – DAT255 - lp4, 2013Chalmers University of Technology, 2013-05-20



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Chalmers On The Go – the Complete Chalmers Experience

**This document…**

Software Development Document

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Det gick inte att hitta några poster för innehållsförteckningen. **Markera de ord i dokumentet som du vill ta med i innehållsförteckningen och välj sedan ett rubrikformat under Format på fliken Start. Upprepa detta för varje rubrik som du vill ta med och infoga sedan innehållsförteckningen i dokumentet. Om du vill skapa en innehållsförteckning manuellt pekar du på ett format under Innehållsförteckning på fliken Dokumentelement och klicka sedan på nedpilen. Klicka på något av formaten under Manuell innehållsförteckning och anger sedan posterna manuellt.**

* Guidelines: Just enough documentation that it makes sense – documentation (not 20 page manual – just enough pages/words) – no page amount to fill – just motivate

**30% grade – ”final acceptance test by a customer”**

* Initial vision
  + How “good” it was
  + That we kept to the initial vision
* User stories
  + How “good” they were
  + How well they capture the vision
  + How they were realized in the application
  + Any non-functional requirements expressed as user stories “will be taken into account when determining ‘goodness’”
* General qualities
  + Performance
  + Usability
  + Stability
  + Makes sense for the domain

**10% grade – ”design decisions”**

* Design elements - UI, classes, packages, external dependencies (libraries, services (Google API)))
  + Well motivated by user stories
  + Well motivated by application needs

**15% grade – ”documentation and testing”**

* Documentation
  + Major design decision (external dependencies etc)
  + Tests for user stories
    - Through: user stories, source code, other artefacts

(30 % Development process – Post-mortem.

15 % Development and Code quality – The code itself)

1. Product,Vision and Requirements

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We will also consider how well the finished application captures the vision, and

How well the stories capture the vision, and

How these are realized in the application.

2. Design Decisions

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Various design elements, such as user interface, classes and packages, as well as external dependencies (libraries and services) will be considered.

Should be motivated by user stories

All external dependencies should be explicitly motivated (except Android)

4. Documentation and Testing

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Major design decision, such as external dependencies, should be documented.

comments build and install instructions getting started “user stories” design document motivation for design decisions

Structure:

What, why

How

What is the product

Differences from original vision and motivate why differences

Code:

Github usage

Usage of design patterna (GRASP etc)

Comments – not only “this is” but also “why this is”

Overall:

Performance

Stability

Usability “Should be reasonable performance – not take 5 sek to react etc”

Content:

Motivate external dependencies (why Google? Why not something else? – Does not need a lot of motivation, enough with “we needed X, this gave X and is recommended by Y”)

Motivate any weaknesses/missing or removed functionality

What was the original idea

How good was the idea

How was the vision/idea translated into user stories

How was the vision/idea realized with the code

What differed from the original vision and why – motivate

Will the user uppleva the intended values

Only a few examples of user stories – not all of them (just to show what kind of stories we used and how they look)

A few unit tests – very nice if they can be connected to user stories, but not a requirement

Only tests for the final release, not for previous releases that are not current now

Nice with a release history – brief

What problems came up and how did we sole/hanterade/kringgick dem?

Change log

**Application development and feature decisions**

**Product backlog**

Product backlog over features (may be extracted from PivotalTracker)

**Design decisions**

Design decisions and description of use of external code (what, how and why)

**Change log**

”Log or record of changes made to a project, such as a [website](http://en.wikipedia.org/wiki/Website) or software project, usually including such records as bug fixes, new features, etc. Some [open source](http://en.wikipedia.org/wiki/Open_source) projects include a changelog as one of the top level files in their distribution.” (Wikipedia)

**Testing**

**Acceptance tests**

Acceptance tests have been run for the different user stories.

Those tested concern design, possibilities and restrictions on the map and application features.

**Test details**

User stories, examples:

* As a user who opens the program, I want to have a fixed view on the Chalmers map, always with the same starting coordinates.
* As a user, I should not be able to zoom out to see larger areas than that of Chalmers.
* As a user, I want to be able to search for buildings and the result should be all rooms.
* As a user, when I type in the search for an item, a dropdown menu with word-completed suggestions should appear.
* As a user I want to see where I am on campus with just one click.
* As a user, I want to be able to search for two separate locations, and get the path between them.
* As a user I want to be able to have a Checkbox Menu in which I can choose between lecture halls, computer rooms and group rooms.

**Unit tests**

All database methods in the DAO (Data Access Object) class have been unit tested, using the public Assert class.

**Test details**

* Insertion and getting in table 4 (buildings table)
  + insertIntoTable4 and getAllFromTable4 were tested together:
    - A building name (String) was inserted into table 4 via insertIntoTable4 and fetched with getAllFromTable4
* Insertion and getting in table 2 (room types table)
  + insertIntoTable2 and getAllFromTable2 were tested together:
    - Three room types (String) were inserted into table 2 via insertIntoTable2 and fetched with getAllFromTable2
* Insertion and getting in table 1 (coordinates and buildings table)
  + insertIntoTable1 and getClosestEntry were tested together:
    - A pair of coordinates (Double) and a building name (String) were inserted into table 1 via insertIntoTable1.
    - The coordinates (Double) were used to create an object (LatLng) containing latitude and longitude.
    - The object (LatLng) and the building name (String) served as input in getClosestEntry.
    - The result of getClosestEntry (LatLng) and the object (LatLng) containing the coordinates were compared and found to be equal.
    - Calculating the closest entry
  + insertIntoTable1 and getClosestEntry were tested together:
    - An object (LatLng) containing zero coordinates, the current coordinates, were created.
    - Five different coordinate pairs (Double) and a building name (String) were inserted into table 1 via insertIntoTable1.
    - The pair of coordinates (Double) closest to the zero coordinates, were in addition used to create an object (LatLng) containing latitude and longitude.
    - The zero coordinates object (LatLng) and the building name (String) served as input in getClosestEntry.
    - The result of getClosestEntry (LatLng) and the closest coordinate pair object (LatLng) were compared and found to be equal.
    - Insertion and getting in table 3 (room name, coordinates, room type, building and floor table)
  + insertIntoTable3 and getRoomCoordinates were tested together:
    - A pair of coordinates (Double) were used to create an object (LatLng) containing latitude and longitude.
    - A room type (String) was inserted into table 2 via insertIntoTable2.
    - A building name (String) was inserted into table 4 via insertIntoTable4.
    - The room name (String), the coordinates (Double, the room type (String), the building name (String) and a floor (String) were inserted into table 3 via insertIntoTable3.
    - The room name (String) served as input in getRoomCoordinates.
    - The result of getRoomCoordinates (LatLng) and the object (LatLng) containing the coordinates were compared and found to be equal.
    - Getting all rooms in a specific building
  + insertIntoTable2, insertIntoTable3, insertIntoTable4 and getAllRoomsInBuilding were tested together:
    - A room type (String) was inserted into table 2 via insertIntoTable2.
    - A real building name (String) was inserted into table 4 via insertIntoTable4
    - A false building name (String) was inserted the same way.
    - Room name1 (String), coordinate pair1 (Double), the room type (String), the true building name (String) and floor1 (String) were inserted into table 3 via insertIntoTable3.
    - Room name2 (String), coordinate pair1 (Double), the room type (String), the true building name (String) and floor2 (String) were inserted into table 3 via insertIntoTable3.
    - A false room name (String), coordinate pair1 (Double), the room type (String), the false building name (String) and floor1 (String) were inserted into table 3 via insertIntoTable3.
    - The true building name (String) served as input in getAllRoomsInBuilding.
    - The result of getAllRoomsInBuilding (ArrayList<String>) was tested using methods size and contains, and found to be satisfactory.
    - Getting all rooms with a specific type
  + insertIntoTable2, insertIntoTable3, insertIntoTable4 and getAllRoomsInBuilding were tested together:
    - A room type (String) was inserted into table 2 via insertIntoTable2.
    - A false room type (String) was inserted the same way.
    - A building name (String) was inserted into table 4 via insertIntoTable4
    - Room name1 (String), a coordinate pair1 (Double), the true room type (String), the building name (String) and floor1 (String) were inserted into table 3 via insertIntoTable3.
    - Room name2 (String), coordinate pair1 (Double), the true room type (String), the building name (String) and floor2 (String) were inserted into table 3 via insertIntoTable3.
    - A false room name (String), coordinate pair1 (Double), the false room type (String), the building name (String) and floor1 (String) were inserted into table 3 via insertIntoTable3.
    - The building name (String) served as input in getAllRoomsInBuilding.
    - The result of getAllRoomsInBuilding (ArrayList<String>) was tested using methods size and contains, and found to be satisfactory.
    - Getting suggestions
  + insertIntoTable2, insertIntoTable3, insertIntoTable4 and suggestions were tested together:
    - A room type (String) was inserted into table 2 via insertIntoTable2.
    - A building name (String) was inserted into table 4 via insertIntoTable4
    - A room name (String), a coordinate pair (Double), the room type (String), the building name (String) and a floor (String) were inserted into table 3 via insertIntoTable3.
    - Different strings of letters matching the strings in table 3 served as input in suggestions.
    - The result of suggestions (ArrayList<String>) was tested using methods for size and null, and found to be satisfactory.
    - Getting room names
  + insertIntoTable3 and getName were tested together:
    - A room name (String), a coordinate pair (Double), a room type (String), a building name (String) and a floor (String) were inserted into table 3 via insertIntoTable3.
    - The room name (String) served as input in getType.
    - The result of getName (String) and the room name were compared and found to be equal.
    - Getting room types
  + insertIntoTable3 and getType were tested together:
    - A room name (String), a coordinate pair (Double), a room type (String), a building name (String) and a floor (String) were inserted into table 3 via insertIntoTable3.
    - The room name (String) served as input in getType.
    - The result of getType (String) and the room type were compared and found to be equal.
    - Getting floor
  + insertIntoTable3 and getFloor were tested together:
    - A room name (String), a coordinate pair (Double), a room type (String), a building name (String) and a floor (String) were inserted into table 3 via insertIntoTable3.
    - The room name (String) served as input in getFloor.
    - The result of getFloor (String) and the floor were compared and found to be equal.

Under testing:

Verify and validate

Test case = input and expected output

Test suite = a set of test cases

Coverage = “quality measure” of tests – how many lines/expressions of code are tested/covered?

Requirements Analysis – acceptance test

Architectural design – system test

Subsyetm design – integration test

Detailed design – module test

Implementation – unit test (often with TDD)

Test to pass – simple test cases

Test to fail – evil test cases

Statement coverage (alla statements/tester gårs igenom) and branch coverage (alla decisions gårs igenom/alla möjliga vägar som kan tas) – find paths through the program (while white box-testing) and make sure to cover them

Acceptance testing – tests a user story (from a “custome” perspective) – the customer can accept or reject



Document What?

1. Requirements - Statements that identify attributes, capabilities, characteristics, or qualities of a system.This is the foundation for what shall be or has been implemented.
2. Architecture/Design - Overview of software. Includes relations to an environment and construction principles to be used in design of software components.
3. Technical - Documentation of code, algorithms, interfaces, and APIs.

Design decisions Vision Statement Operations documentation Project overview Requirements document Support documentation System Documentation User documentation

Burn down chart btw!

Agile development är målet



With high quality source code and a test suite to back it up you need a lot less system documentation.

Developers rarely trust the documentation, particularly detailed documentation because it's usually out of sync with the code

Ask whether you NEED the documentation, not whether you want it

Document stable things, not speculative things