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Software Engineering and Architecture

The Exam

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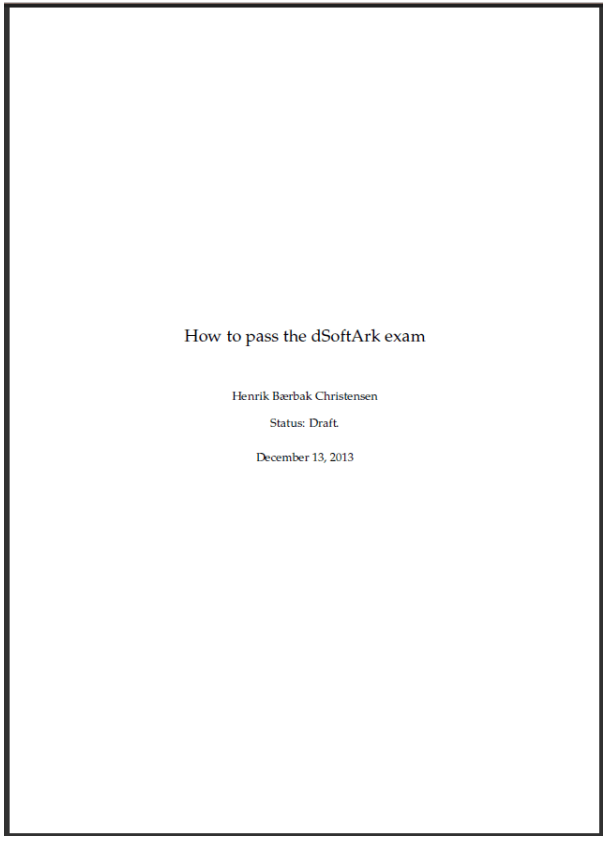
Exam guide

- Draft from 2013 + 17 + 18 + 19
  - Feedback is very welcome
- On the last week plan
- Updated 26-11-2019!


How to pass the dSoftArk exam

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Status: Draft

December 13, 2013

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When

- First time ever – rather distributed over Dec + Jan
  - Censors: Magnus Madsen, Gudmund Frandsen

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Dispensations

- **Important about those applying for dispensation**
  - (Requesting the preparation time to be extended)

- **Apply early!!!**

- Reason:
  - Due to logistics, *all students with a dispensation are grouped into a single examination day*
  - ***Thus it is vital that we know the number early to make usable planning of the examination days!!!***

- Days for ordinary exams *will* proceed with ~30-35 min slots!

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How

- Have your *study id card* ready
- Draw a ***random exercise***
- **Read, understand, and 'start solution'**

- I do not expect a complete and polished solution!

- *Better to understand the exercise than show a solution to something else than the exercise*
  - Not a disaster, but it takes valuable time out of the examination

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The Exam Exercise

- It should be obvious, but still...

Any form of copying and distribution of an exam exercise is exam cheating. Exam exercises are secrets.

Any instances of copies on any platform should be reported to me!

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How: The Preparation

- In the room
  - Paper and pencils
  - The DP cheat sheets
  - **Foils and foil pencils**
    - *So oldschool but fast and versatile*
- Draw UML, EC tables, part of the code, etc.

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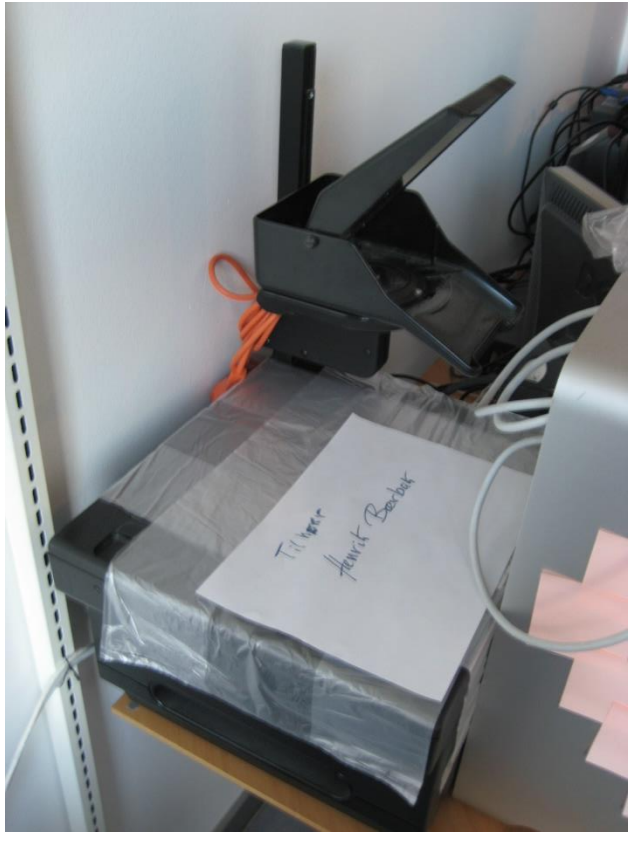
The Exam

- Foils on the projector
  - *Allow you to add stuff on top at the whiteboard!*
- I will quickly start discussing



- 11-12 minutes only
  - ‘but … I only have started’

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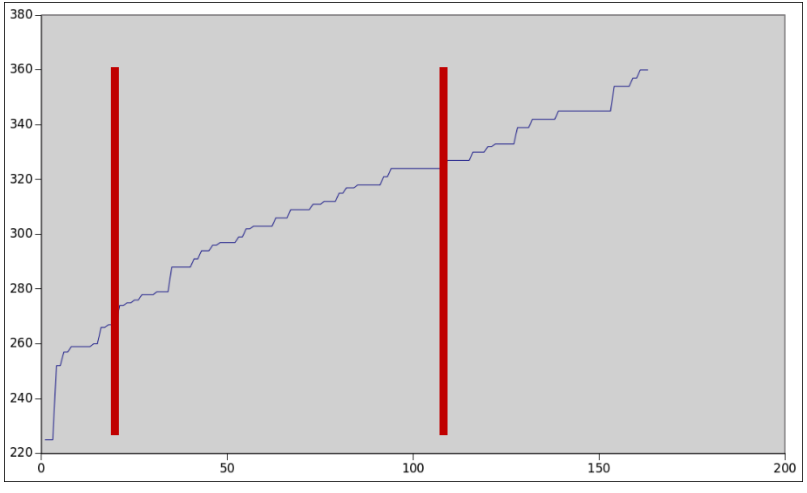
Grading

- The scoring of your oral and mandatory is *an overall assessment of both contributing parts*
- The precedent is the following
  - Mandatory scores are put into 3 brackets, representing *lower (02-4), middle (7), and higher (10-12) bracket*

Example from 2017



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And The Grade?

- The precedent is the following
  - We assign an approximate grade for the oral exam
  - If the mandatory score is in another bracket than the oral, it may settle the final grade by increasing/decreasing it by one grade point
- **Example:**
  - Bjarne is a 4 or 7 at the oral, was *lower* bracket. **Get a 4.**
  - Birthe is a 10 at the oral, was *higher* bracket. **Get a 10.**
  - Calle is a 02 at the oral, was *higher* bracket. **Get a 4.**
  - Celine is a 7, was *higher* bracket, but JUST. **Get a 7.**
  - Danny is a 00 at the oral, so the *higher* bracket is irrelevant. **Get 00.**

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Hints and Advice

Format

- Use the provided exam question set to rehearse the exam format
  - Pick an exercise
  - Spend 20-25 minutes
    - Finding solution techniques
    - Partially solving it
  - Spend 12 minutes
    - Discussing it with your fellow students

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Good hints

- Oral exams require oral presentation
  - This can be learned!
  - How? **By rehearsing oral presentation!**
- And you will face it many, many, times over the next 40 years...
  - Trust me ☺

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Nervous?

- Some students are not nervous at exams.
  - How do you do that???
- Some are...
  - Learn to **use** your nervousness, instead of trying to avoid it...
- *Perhaps it is not a problem, it is a condition of life…*
  - *Problems you solve, conditions you learn to live with…*

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Paths to Failure

Common failing reasons

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Observations

- Commonalities in failing the SWEA exam
- Level 1
  - Coding mastery
- Level 2
  - Shallow learning / ”parrot knowledge”
  - Reading a specification causes problems
  - A few in the classic category: read the book also…

Coding

- Too many do not fail SWEA, but fail IntProg at my exam

```
assertThat( pws.parse(String line), is(true) );
```

```
private ParseWorkSpecification pws;

@Before
public void setup() {
  ParseWorkSpecification pws = new ParseWorkSpecification();
}

@Test
public void shouldDoSomething() {
  assertThat(pws.parse("Wed 1"), is(true));
}
```

What is a constructor?

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The IDE trap

- Eclipse / IntelliJ are marvelous tools that speed up programming by context-sensitive typing
  - **The whiteboard cannot do that!**
- Try to code and compile a Java program in Notepad/Gedit/Vi/Emacs and the shell/DOS Prompt!

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Parroting 1

- ”Parrot” knowledge
  - You can learn the *visual appearance* of Strategy pattern UML
  - You can learn the *visual appearance* of Strategy code template
  - You can learn the *common names* used in Strategy

  - Without any clue of what Strategy **is**

- Beware of it!

Parroting

- ”Fine, but what if I need the LG variant of Map?”

```
public class RunAppImpl implements RunApp {
  private MapStrategy SamsungMapStrategy;

  public void updatePositionOnMap(Location l) {
    SamsungMapStrag.CalculatePos(l);
```

- ”Fine, but is it normal that a strategy has a public datastructure, like a HashMap, as in your code?”

```
username = strategy.map.get(keycode);
```

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Pattern Matching

- Similar – ”pattern matching” shallow learning
  - Make ECs correctly for an interval in the exercise
    - But fail to mention what heuristics that has been used (range)
    - Fail to know how the range heuristics is formulated
    - Fail to know what an EC is at all
  - Make ‘ECs’ that are test cases
    - 7 [b1]
- Conclusion
  - Learned the ”template”, then put arbitrary stuff into it ☹

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Exercise Reading

- You will have to read the exercise and understand at least a bit of it
  - I acknowledge it is a problem if you do not know what a GPS is
    - *”GPS is not part of the curriculum”,* yeah well ?
    - What does ‘visibility’ mean’? What does ‘server’ mean? What does ‘blood pressure’ mean?
  - I have to assume you live in a modern world with it systems
- **Read the code fragments – they are the key question**

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And of course the usual

- A few fail of the same reason as in other courses
  - Have we read the same book and coded the same exercises???

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Conclusion

- You have to understand *some* of this course to pass it
  - You need some level of mastery of Java or OO language
    - Which you learn by *doing it*
  - You need to understand what is *behind* the templates
    - Which you learn by *doing it*
  - You need to be able to read a small specification
    - Which you do by *reading it*

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Two Specific Issues

- TDD – it is 2-3 month since you did it
  - *Avoid the trap of iterations that do not drive production code*
  - Example:
    - Iteration 1: return ‘error’; Iteration 2: also return ‘error’ ☹ (no drive)
    - Iteration 1: return ‘constant-for-case-a’;
      Iteration 2: return ‘constant-for-case-b’; ☹ (no triangulation)
- Broker
  - **All exercises are ‘server created objects’ type**
  - Fall-back strategy:
    - Treat return object as pass-by-value
      - No need for name service, objectId creation, client proxy generation

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How to train/rehearse...

- Work in teams
  - Test-drive oral presentations on the example exam set
  - Solve non-mandatory weekplan exercises
    - And use them as exam questions
  - Code simple exercises – **mastery through exercise**
    - I have TDD'ed the PayStation 30+ times
    - Do the safe-tutorial on you own, PayStation on your own
    - Introduce a Strategy in IntProg code or whatever...
    - Make EC analysis of IntProg exercise
  - Review and discuss your team mates' efforts

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SWEA 2019 signing off…

It has been a pleasure flying with you