Date 2009-04-21

EXAM 5DV087, VT09

# TENTAMEN/EXAM

# Kurs/course: Programvaruteknik / Software Engineering (5DV087)

Ansvarig lärare/responsible teacher: Jürgen Börstler

Datum/date: 2009-04-21 Tid/time: 13.00-17.00 (4 timmar/hours)

Kod	/code:	

#### **Instructions:**

- You can answer in English or in Swedish
- Write your code and the question number in the upper right of every page
- Motivate your answers and explain all assumptions
- Please do the following to speed up correction time:
  - o Write only on one side of the paper
  - o Start a new page for every question
  - o Order your papers by question number
  - o Mark all questions you have answered
  - o Leave a margin for comments

4	
5	
6	
7	
8	

TOTAL

**Exercise** 

number

X

**Points** 

Please mark exercises you have solved in column X.

Thanks and good luck, lycka till, viel Glück!

This page must be returned together with your answers.

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#### Question 1 (4p)

Describe and discuss the main differences between agile and traditional software development processes. If possible, use the four statements (values) of the Agile Manifesto as a basis for this discussion.

### **Question 2 (3+2p)**

- (a) Describe the basic principles and problems of *algorithmic* cost modeling/estimation; use COCOMO as an example.
- (b) What are cost drivers? Why are they needed and how are they used? Give at least two examples.

### **Question 3 (1+4p)**

- (a) Describe the idea of design patterns.
- (b) Describe a particular design pattern and discuss how this pattern's usage can improve a software design.

# **Question 4 (3+1+2p)**

In the lecture, we have talked about functional requirements, non-functional requirements and business rules.

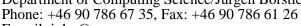
- (a) Describe each of these three terms and give an example for each.
- (b) Why is validation of non-functional requirements particularly difficult?
- (c) Formulate concrete examples for non-functional requirements that are reasonably easy to validate (you get credits for at most four).

### Question 5 (3+2p)

- (a) Name and describe at least two graphical notations for requirements documentation.
- (b) Give a small example for each of them.

## Question 6 (3p)

(a) What are formal inspections? Please explain what characterizes formal inspections and how they are carried out.



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#### Question 7 (2p)

What is traceability? Why is it important and how can it be supported?

### **Question 8 (1+2+6p)**

- (a) What is the main purpose of testing?
- (b) Explain the main idea behind coverage-based testing to develop test cases.
- (c) Develop test cases for reaching branch coverage for the following example:

```
function binSearch (var a: array [1..n] of integer;
                     left, right, key: integer): integer;
    var middle: integer;
begin
    found := false;
    while (left <= right) and not found do begin</pre>
         middle := (left + right) div 2;
         if a[middle] = key then
               found := true
         else if a[middle] < key then</pre>
               left:= middle + 1
         else
               right := middle - 1
    end;
    if found then
         binSearch := middle
    else
         binSearch := 0
end;
```