LTAT.05.006: Software Testing

Lecture 14:
Exam Preparation

Spring 2020

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Lectures

• Lecture 1 (13.02) – Introduction to Software Testing
• Lecture 2 (20.02) – Basic Black-Box Testing Techniques: Boundary Value Analysis & Equivalence Class Partitioning
• Lecture 3 (27.02) – BBT advanced: C/E-Graphing & Combinatorial Testing
• Lecture 4 (05.03) – Basic White-Box Testing Techniques: Instruction & Control-Flow Coverage
• Lecture 5 (12.03) – BBT adv.: State-Transition, Random, Metamorphic Testing
• Lecture 6 (19.03) – Test Levels, Test Tools, Test Automation
• Lecture 7 (26.03) – BBT adv.: Exploratory Testing, Behavior Testing
• Lecture 8 (02.04) – BBT adv.: GUI / Visual Testing, Security, Usability, A/B Testing
• Lecture 9 (09.04) – WBT adv.: Data-Flow Testing, Mutation Testing
• Lecture 10 (16.04) – WBT adv.: Symbolic Execution, Static Code Analysis, Review
• Lecture 11 (23.04) – Defect Estimation / Test Documentation, Organisation and Process Improvement (Test Maturity Model)
• Lectures 12+13 (30.04 + 07.05) – Industry Guest Lectures (see course wiki)
• Lecture 14 (14.05) – Exam Preparation
Exam Dates

- Exam 1: Thu 21-May, 10:15-11:55, any room – no limit
- Exam 2: Mon 01-Jun, 16:15-17:55, any room – no limit

You must receive
... at least 33% of the max. possible points from the homework assignments to qualify for the exam and
... at least 10 marks in the exam to not fail the course.
In total, you need at least 50 marks to not fail the course.

- Retake Exam (resit): 15-June, 16:15-17:55
  - Please note that you must register for the retake exam at the latest 3 days before the exam date
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The “or” is exclusive \( \rightarrow \) Exam 1 xor Exam 2
Exam Dates

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Study Regulation: “If the student is not present at the exam, mark ‘F’ (fail) should be inserted into SIS. If the students was sick, he/she should present medical certificate to Ülle Holm who will cancel the result.”

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The exams will be done via Moodle
Status after HW10

Homeworks 1-10 (mapped to 60 points)

100% of 10 best HW
50% of course
33% of 10 best HW

All active students have qualified for the exam
Exams in Moodle

Exam 1

This is the first exam option. Exam 1 takes place on Thursday, May 21 and starts at 10:15. You must be registered in SIS for exam 1 (any of the three rooms is ok) if you want to take this exam.

The exam lasts 100 min and consists of two parts.

After 100 min the exam closes automatically and whatever you have filled into the answers will be saved and used for marking.

The maximum number of points is 30.

Part 1 [22 points] will be marked automatically (multiple-choice).

Part 2 [8 points] will be marked manually.

NOTE: You do not need to submit. At the end of the exam time, Moodle will automatically close the exam and submit the data you have entered up to that point. However, if you are sure that you have finished before the end time, you may submit yourself. Just keep in mind that you cannot re-open the exam. You only have one attempt.

Exam1-Part1+Part2

Part1 (questions 1-22) of the exam resembles what you did in the quizzes. Each question has one correct answer. These questions will be graded automatically.

Part2 (questions 23+24) of the exam are open text question. Please answer each sub-question by writing in the open text field. Clearly state to which sub-question (a, b, c ....) your answer relates. These questions will be graded manually.
Exams in Moodle

Exam 1

This is the first exam option. Exam 1 takes place on Thursday, May 21 and starts at 10:15. You must be registered in SIS for exam 1 (any of the three rooms is ok) if you want to take this exam.

The exam lasts 100 min and consists of two parts.

After 100 min the exam closes automatically and whatever you have filled into the answers will be saved and used for marking.

The maximum number of points is 30.

Part 1 [22 points] will be marked automatically (multiple-choice).

Part 2 [8 points] will be marked manually.

NOTE: You do not need to submit. At the end of the exam you are automatically submitted. You can stop the exam at any point. However, if you are sure that you have finished the exam you only have one attempt.

Example exams:

- Exam 2019 (Duration: 100 min)
- Exam 2018 (Duration: 100 min)
- Exam 2017 (Duration: 100 min)
- Exam 2016 (Duration: 100 min)
- Exam 2015 (Duration: 100 min)
- Exam 2014 (Duration: 100 min)
- NB: This year (in 2020), the exam consists of 2 parts:
  - Part 1: 22 Multiple-Choice Questions (22 marks)
  - Part 2: Two Constructive Tasks (8 marks)
Exams in Moodle

Exam 1

This is the first exam option. Exam 1 takes place on Thursday, May 21 and starts at 13.00. You must be registered for one of the three rooms for exam 1 (any of the three rooms is ok) if you want to take this exam.

The exam lasts 100 min and consists of two parts.

After 100 min the exam closes automatically and whatever you have achieved is valid.

The maximum number of points is 30.

Part 1 [22 points] will be marked automatically.

Part 2 [8 points] will be marked manually.

NOTE: You do not need to submit. At the end of the exam, your result will be displayed. However, if you are sure that you have completed the exam, you can submit your result. You can only submit your result once. After submitting, you cannot open the exam. You only have one attempt.

Exam1-Part1+Part2

Part1 (questions 1-22) of the exam resembles what you have seen in the quizzes. Each question has only one correct answer. These questions will be graded automatically.

Part2 (questions 23+24) of the exam are open text questions. Please answer the sub-question by writing in the open text field. Clearly state to which sub-question (a, b, c ....) your answer relates. These questions will be graded manually.

You must register for one of the exams (either Ex. 1 or Ex. 2) to be able to take the exam.

The “or” is exclusive → Exam 1 xor Exam 2
You must register in SIS

9 qualified students have not yet register for any exam!

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Information systems of University of Tartu. The page compiled 11.05.2020 10:39, user Dietmar Alfred Paul Kurt Pfahl
Questions ?
Final Exam – Content/Topics Overview

• Introduction to Software Testing
• Basic Black-Box Testing Techniques
• Advanced Black-Box Testing Techniques:
  – Combinatorial Testing, Random Testing, Metamorphic Testing
  – State-Transition Testing & Exploratory Testing
  – Security, Usability and A/B Testing
• Basic White-Box Testing Techniques
• Advanced White-Box Testing Techniques:
  – Data-Flow Testing / Mutation Testing
• Test Lifecycle / Test Tools / Test Automation / Test Levels / BDD & Behavior Testing / GUI Testing / Visual Testing
• Quality Estimation / Test Documentation, Organisation and Process Improvement (Test Maturity Model)
Final Exam – Content/Topics Overview

Introduction to Software Testing:
• Know the basic terminology
  – Software Testing & Software Quality
  – Verification & Validation
  – Error – Fault – Failure
    • NB: Two competing definitions of ’Error’
  – Test Case – Test Suite – Test Oracle ...
  – Test Levels
  – Debugging
Final Exam – Content/Topics Overview

Black-Box Testing Techniques:
• Difference between Black-Box and White-Box Testing
  – Strengths & Weaknesses of each
• Know various BBT Techniques:
  – Equivalence Class Partitioning
  – Boundary Value Testing
  – Combinatorial Testing & Random Testing
  – Metamorphic Testing
  – State-Transition-Testing
  – Exploratory Testing
  – Security, Usability, and A/B Testing
Final Exam – Content/Topics Overview

White-Box Testing Techniques:
• Difference between Black-Box and White-Box Testing
  – Strengths & Weaknesses of each
• Control-Flow Testing
  – Know how to construct a Control-Flow-Graph
  – Know different coverage criteria:
    • Statement/Block, Decision/Branch, Condition, Linearly Independent Paths, etc.
• Data-Flow Testing,
• Mutation Testing
Final Exam – Content/Topics Overview

Static Testing (Reviews & Inspections):

• Document Reviews (Inspections)
  – Why needed?
  – What variants exist?

• Static Code Analysis
  – What are false positives?

• Symbolic Execution
  – What is the main idea?
  – How does it work (-> example)?
Final Exam – Content/Topics Overview

Test Lifecycle:
• Agile Testing
• Specifics of Testing OO Code
  – Intra-Class Testing (‘Stack’ Example)
  – Inter-Class Testing
• System versus Unit Testing
• Regression Testing
• Behaviour Testing
  – Gherkin
Final Exam – Content/Topics Overview

Quality Estimation:
• Types of estimation models
• Capture-Recapture models
  – How does it work (-> examples)?
• Reliability Growth models
  – What is the main idea?
Questions?
Good Luck!