CHALMERS
EXAMINATION / TENTAMEN

Course code/kurskod	Course name/kursnamn			
DIT636	Software quality and testing			
Anonymous code Anonym kod		Examination date Tentamensdatum	Number of pages Antal blad	Grade Betyg
DIT636-0053-ASB		13/03-24	11	5

* I confirm that I've no mobile or other similar electronic equipment available during the examination.
Jag intygar att jag inte har mobiltelefon eller annan liknande elektronisk utrustning tillgänglig under eximinationen.

Solved task Behandlade uppgifter No/nr		Points per task Poäng på uppgiften	Observe: Areas with bold contour are to completed by the teacher. Anmärkning: Rutor inom bred kontur ifylles av lärare.
1	X	9	
2	X	10	
3	X	10	
4	X	12	
5	X	8	
6	X	8	
7	X	15	
8	X	15	
9	X	12	
10			
11			
12			
13			
14			
15			
16			
17			
Bonus poäng			
Total examination points Summa poäng		99	

[redacted]

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CHALMERS	Anonymous code Anonym kod DIT636-0053-ASB	Points for question (to be filled in by teacher) Poäng på uppgiften (ifylles av lärare)	Consecutive page no. Löpande sid nr 1 Question no. Uppgift nr 1

1.1) c

1.2) b

1.3) a

1.4) a

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1.5) c, d -a

1.6) b

1.7) a

I would not mind waiting a little bit for a chatbot to answer, but would mind if I cant access it.

Answer only one question on this page. Do not write on the back of this paper
Behandla endast en uppgift på detta blad. Skriv ej på baksidan

CHALMERS	Anonymous code Anonym kod DIT636-0053-ASB	Points for question (to be filled in by teacher) Poäng på uppgiften (ifylles av lärare)	Consecutive page no. Löpande sid nr 2 Question no. Uppgift nr 2

performance:

Description: The system shall normally filter events by date within 10 ms.

System state: The system is under normal load(~500 requests/min) with sufficient internet connection.

System environment: The environment is under normal conditions, I.E. sufficient for normal operation.

External stimulus: A user filters events via the ui by date range. This range encompasses 1 year.

Required system Response: The system displays the events that fall inside given date range.

Response measure:

95% of the time, within 10 ms.

99% of the time within 100 ms.

Availability:

Description: The system shall under normal operation not be unaralable for more than 5 minutes in the case of host-site power outage.

system state: The system is under normal load (~500 requests/min).

System environment: The system enviornment is under normal and sufficient conditions.

External stimulus: The hosting-site suffers a power outage.

Required system response:
The system shall deploy to a different hosting site until the main hosting-site has stable power.

Response measure:
The system shall not be unaraila ble for more than 5 minutes

Assumptions:
The system is hosted at 1 physical location under normal conditions.

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Points for question
(to be filled in by teacher)
Poäng på uppgiften
(ifylles av lärare)

Consecutive page no.
Löpande sid nr 4

Question no.
Uppgift nr 3

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I will be describing unit testing:

unit testing is looking at the smallest independent unit possible. For object oriented languages that often means that you have one test file for each class in your system. In that test file you test the methods that belong to that class as independently as possible. You might mock external dependencies to make sure you are testing only the class in question. unit tests are conventionally the most numerous kind of test in a test suite. The reason for this is two-fold. Firstly unit tests are often cheaper (in terms of resources to execute and development) than other tests. secondly unit tests are needed to ensure efficacy for other kinds of tests. system tests for example, are used to test integration. But how do you know that you're testing integration if you are not confident the individual units work as expected? smaller tests such as unit tests also make finding the actual problems easier. since you test less code in one test.

To summarize, unit tests look to test small units of code. system testing aims to test integration between units and exploratory aims to test UI usability and functionallity, as well as validating your system.

unit tests are most likley to find faults in your buissines logic, not code infrastructure.

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CHALMERS

Anonymous code
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Points for question
(to be filled in by teacher)
Poäng på uppgiften
(ifylles av lärare)

Consecutive page no.
Löpande sid nr 5

Question no.
Uppgift nr 4

Choices:

Choices

→ user ID:

valid(string)

non-string ERROR

~~Does not exist~~

← constraints

user in DB:

Exists property UExists

Does not exist ERROR

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Representative values

jobID:

→ valid(string)

non-string ERROR

job in DB:

Exists property JExists

Does not exist ERROR

user role:

Fills requirments

Does not fill requirnments

user salary(in relation to job req):

in range

Too low

Too high

Equals low bound SINGLE

Equals high bound SINGLE

user time in role(in relation to job req):

Fills req

Does not fill req

user Highest degree(in relation to req degree):

Fills req

Does not fill req

user Citizenship(in relation to job req):

Fills req

Does not fill req

IF UExists AND JExists

Answer only one question on this page. Do not write on the back of this paper
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This list is far from exhaustive since that would take an infeasible amount of time.

CHALMERS	Anonymous code Anonym kod DIT636-0053-ASB	Points for question (to be filled in by teacher) Poäng på uppgiften (ifylles av lärare)	Consecutive page no. Löpande sid nr 7 Question no. Uppgift nr 5

1). Anti-solidl tour:

Anti-social tour is about inputting unexpected input too ensure that the system holds up even if we get input that might not make sense, but are valid.

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2).

sequence1: 1.open event browser, 2.Filter events between jan 1 1472 and jan 1 2250.

This tests that date filtering holds up when selecting an unusual/extreme time window.

sequence 2: 1. Log in as organizer. 2. Create an event. 3. Create an identical event.

This will test that the system holds when creating identical events, which might not be expected

sequence 3: 1. Go to registration page 2. try to input 2000 random characters for username.

This will check that the system holds for unexpectedly long usernames.

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CHALMERS	Anonymous code Anonym kod DIT636-6053-ASB	Points for question (to be filled in by teacher) Poäng på uppgiften (ifylles av lärare)	Consecutive page no. 8 Löpande sid nr Question no. 6 Uppgift nr

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1)

```
@test
public void mysubstring_Normal(){
    String expected= "Hello";
    assertEqual(expected, mysubstring("Hello world", 0, 4);
}
```

2)

```
@test
public void mysubstring_IndexoutofBounds(){

    assertThrows(IndexOutofBoundsException.class, ()->{
        mysubstring("Hello", 0, 35);
    });
}
```

↑

Asuming IndexOutofBoundsException is thrown when index is out of bounds.

Answer only one question on this page. Do not write on the back of this paper
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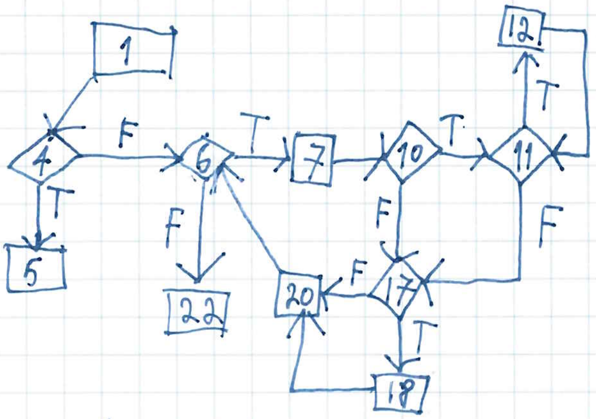
1)



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◇ = conditionals (control flow only)

[N] = non-conditional code starting at N
↑
(control flow)

2)

Lines covered:	Branches covered:
1: [1] : 2-5	4-T
2: [2,1] : 2-4, 6-10, 17-20, 22	4-F, 6-T, 10-F, 17-T, 6-F
3: [1,2,1,3] : 2-4, 6-20, 22	4-F, 6-T, 10-T, 11-T, 11-F, 17-T, 17-F, 6-F

Input 1 and 3 achieves statment coverage and 1, 2 and 3 branch coverage

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CHALMERS	Anonymous code Anonym kod DIT636-0053-ASB	Points for question (to be filled in by teacher) Poäng på uppgiften (ifylles av lärare)	Consecutive page no. Löpande sid nr 10 Question no. Uppgift nr 8

1) ror: 7, 10, 14, 16, 20

aor: 7, 9, 15

crp: 6, 7, 11, 17, 22

2) ror: 20: if(nums[prev_item != item)

aor: 7: ..., array_size)+1]...

crp: 22: return 0;

3) ror: [1,2,3,4,5], 3 , will get -1, not the value back

aor: [1], 2 , will get out of bounds

crp: [1,2,3], 0 , will get 0 instead of -1

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CHALMERS	Anonymous code Anonym kod DIT636-0053-ASB	Points for question (to be filled in by teacher) Poäng på uppgiften (ifylles av lärare)	Consecutive page no. Löpande sid nr 11 Question no. Uppgift nr 9

1) 12

G(Robot_Leg_Status=Moving->Robot_Arm_status !=moving)

The robots arms and legs can never both more at the same time to avoid accidents.

G(Order_status=Placed->Robot_status!=Idle)

If there is an order placed the robot should not be idle.

2)

AG(order_status=Packing->AF(order_status=shiped))

It is true for all timelines that if order status is packing, it must for all timelines from that point eventually be shipped.

G(order_status=Placed-> F(packaging_status=Box Requested))

If there is an order, a box must eventually be ordered.

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