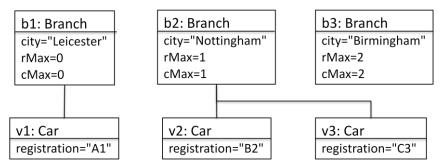# Class Test - Not Assessed - Group B

Full Name [   ] CFS [   ]

You will be given 5 test reports (each consisting of a sequence of invocations) and the source code of their implementation. Your task is to find out which test reports show failures of the service to satisfy the specification and locate the faults responsible for the failures in the code.

At the start of each test case the database is initialised with 3 branches and 3 cars using the following data:

b1: Branch	b2: Branch	b3: Branch
city="Leicester"	city="Nottingham"	city="Birmingham"
rMax=0	rMax=1	rMax=2
cMax=0	cMax=1	cMax=2

v1: Car	v2: Car	v3: Car
registration="A1"	registration="B2"	registration="C3"

Question 1) Please use the following table to report the failed steps and explain briefly how the behaviour differs from the specification. The first row has been completed as an example of what is expected.

Failed step only		Brief Justification
Test Report *No*	Step *No*	
1	1	No change in attribute *Branch(Leicester).cMax* , which should be increased from 0 to 1.

Failed step only		Brief Justification
Test Report *No*	Step *No*	
		....
		....
		....
		....

Question 2) Please locate the faults responsible for the failures you identified under 1). Use line numbers to indicate where these faults occur in the code and explain briefly. Again, the first row provides an example.

Failed step only		line number and Statement if it exists
Test Report *No*	Step *No*	
1	1	Between lines (8 and 13): missing a statement to update attribute *cMax*

As a part of our survey, please answer the following questions:

- How many years of experience do you have in OO programming? ⬚

- For how long, if at all, have you worked in software development outside university? ⬚

- If any, how much of this time (in%) involved testing and debugging? ⬚

Test Report 1

Step	Operation invocation	Extracted visual contracts	Access in the code *line number*
1	registerClient("Leicester", "Reiko")	Return : "Leicester_0" b1: Branch — city ="Leicester", cMax = 0 → b1: Branch — city ="Leicester", cMax = 0 — of → c1: Client — cID="Leicester_0", cName="Reiko"	b1:Branch - 6, 11, 13 c1:Client - 9, 10, 11, 14
2	registerClient("Leicester", "Abdullah")	Return : "Leicester_1" b1: Branch — city ="Leicester", cMax = 0 → b1 : Branch — city ="Leicester", cMax = 0 — of → c2: Client — cID="Leicester_1", cName="Abdullah"	b1:Branch - 6, 11, 13 c2:Client - 9, 10, 11, 14
3	makeReservation("Leicester_1", "Leicester", "Nottingham")	Return : "Leicester_1" v: Car — registration="A1" — at → b1: Branch — city ="Leicester", rMax = 0 — of → c2: Client — cID="Leicester_1", cName="Abdullah"; b2: Branch — city ="Nottingham" → v: Car — registration="A1" — at → b1: Branch — city ="Leicester", rMax = 1 — of → c2: Client — cID="Leicester_1", cName="Abdullah"; b2: Branch — city ="Nottingham"; r: Reservation — reference="Leicester_1" (for, pickup, made, dropoff)	b1:Branch - 21, 24, 39, 40 b2:Branch - 22, 40 c2:Client - 24 v:Car - 30, 40 r:Reservation - 40, 47, 48
4	makeReservation("Leicester_1", "Birmingham", "Leicester")	Return : null b3: Branch — city ="Birmingham", rMax = 0 → b3: Branch — city ="Birmingham", rMax = 0 c2: Client — cID="Leicester_1", cName="Abdullah" — of → b1: Branch — city ="Leicester", cMax = 0 → c2: Client — cID="Leicester_1", cName="Abdullah" — of → b1: Branch — city ="Leicester", cMax = 0	b1: Branch - 22, 27 b3:Branch - 21, 24, 30 c2:Client - 27
5	cancelReservation ("Leicester_1")	No return r1: Reservation — reference = "Leicester_1" → ∅	r1:Reservation - 55, 56

Test Report 2

Step	Operation invocation	Extracted visual contracts	Access in the code *line number*
1	registerClient("Nottingham ", "Reiko")	**Return : " Nottingham_0"** b1: Branch — city =" Nottingham ", cMax = 1 → b1 : Branch — city =" Nottingham ", cMax = 1 of c: Client — cID=" Nottingham _0", cName="Reiko "	b1:Branch - 6, 11, 13 c:Client - 9, 10, 11, 14
2	makeReservation("Nottingham_0", "Nottingham", "Nottingham")	**Return : "Nottingham_2"** v1: Car — registration="B2" at b1: Branch — city ="Nottingham", rMax = 1 of c: Client — cID=" Nottingham _0", cName="Reiko " → v1: Car — registration="B2" for at b1: Branch — city ="Nottingham", rMax = 2 dropoff pickup r1: Reservation — reference="Nottingham_2" of c: Client — cID=" Nottingham _0", cName="Reiko " made	b1: Branch - 21, 22, 24, 39, 40 c:Client - 24 v1:Car - 30, 40 r1:Reservation - 40, 47, 48
3	makeReservation("Nottingham_0", "Leicester", "Nottingham")	**Return : "Leicester_1"** v2: Car — registration="A1" at b3: Branch — city ="Leicester", rMax = 0 c: Client — cID=" Nottingham _0", cName="Reiko" of b1: Branch — city ="Nottingham" → v2: Car — registration="A1" for at b3: Branch — city ="Leicester", rMax = 1 pickup r2: Reservation — reference="Leicester_1" c: Client — cID=" Nottingham _0", cName="Reiko" made of b1: Branch — city ="Nottingham" dropoff	b1:Branch - 22, 27, 40 b3: Branch - 21, 24, 39, 40 c:Client - 24, 27 v2:Car - 30, 40 r2:Reservation - 40, 47, 48
4	cancelReservation ("Nottingham_2")	**No return** r1: Reservation — reference = " Nottingham _2" r2: Reservation — reference = "Leicester_1" → ∅	r1:Reservation - 55, 56 r2:Reservation - 55, 56

Test Report 3

Step	Operation invocation	Extracted visual contracts	Access in the code *line number*
1	registerClient("Leicester", "Reiko")	Return : "Leicester_0" **b1: Branch** — city ="Leicester", cMax = 0 → **b1: Branch** — city ="Leicester", cMax = 0 of **c1: Client** — cID="Leicester_0", cName="Reiko"	b1:Branch - 6, 11, 13 c1:Client - 9, 10, 11, 14
2	registerClient("Leicester", "Abdullah")	Return : "Leicester_1" **b1: Branch** — city ="Leicester", cMax = 0 → **b1 : Branch** — city ="Leicester", cMax = 0 of **c2: Client** — cID="Leicester_1", cName="Abdullah"	b1:Branch - 6, 11, 13 c2:Client - 9, 10, 11, 14
3	makeReservation("Leicester_0", "Leicester", "Birmingham")	Return : "Leicester_1" **v1: Car** — registration="A1" at **b1: Branch** — city ="Leicester", rMax = 0 of **c1: Client** — cID="Leicester_0", cName="Reiko" **b2: Branch** — city ="Birmingham" → **v1: Car** — registration="A1" (for) at **b1: Branch** — city ="Leicester", rMax = 1 (pickup) of **c1: Client** — cID="Leicester_0", cName="Reiko" (made) **r1: Reservation** — reference="Leicester_1" **b2: Branch** — city ="Birmingham" (dropoff)	b1: Branch - 21, 24, 39, 40 b2:Branch - 22, 40 c1:Client - 24 v1:Car - 30, 40 r1:Reservation - 40, 47, 48
4	makeReservation("Leicester_1", "Leicester", "Leicester")	Return : "Leicester_2" **v2: Car** — registration="A1" at **b1: Branch** — city ="Leicester", rMax = 1 of **c2: Client** — cID="Leicester_1", cName="Abdullah" → **v2: Car** — registration="A1" (for) at **b1: Branch** — city ="Leicester", rMax = 2 (dropoff)(pickup) of **c2: Client** — cID="Leicester_1", cName="Abdullah" (made) **r2: Reservation** — reference="Leicester_2"	b1: Branch - 21, 24, 39, 40 b3:Branch - 22, 40 c2:Client - 24 v2:Car - 30, 40 r2:Reservation - 40, 47, 48
5	cancelReservation ("Leicester_1")	No return **r1: Reservation** — reference = "Leicester_1" **r2: Reservation** — reference = "Leicester_2" → $\varnothing$	r1:Reservation - 55, 56 r2:Reservation - 55, 56

Test Report 4

Step	Operation invocation	Extracted visual contracts	Access in the code *line number*
1	registerClient("Nottingham", "Reiko")	Return : " Nottingham_0" b1: Branch, city =" Nottingham ", cMax = 1 → b1 : Branch, city =" Nottingham ", cMax = 1 of ↓ c1: Client, cID=" Nottingham _0", cName="Reiko "	b1:Branch - 6, 11, 13 c1:Client - 9, 10, 11, 14
2	makeReservation("Nottingham_0", "Nottingham", "Birmingham")	Return : " Nottingham_2" v1: Car, registration="B2" at ↑ b1: Branch, city ="Nottingham", rMax = 1 of ↓ c1: Client, cID="Nottingham_0", cName="Reiko" b2: Branch, city ="Birmingham" ⇒ v1: Car, registration="B2" — for at ↑ b1: Branch, city ="Nottingham", rMax = 2 — pickup of ↓ r1: Reservation, reference="Nottingham _2" c1: Client, cID="Nottingham_0", cName="Reiko" — made b2: Branch, city ="Birmingham" — dropoff	b1: Branch - 21, 24, 39, 40 b2:Branch - 22, 40 c1:Client - 24 v1:Car - 30, 40 r1:Reservation - 40, 47, 48
3	pickupCar("Nottingham_2")	No return v1: Car, registration="B2" — for at ↑ r1: Reservation, reference="Nottingham _2" b1: Branch, city ="Nottingham" — pickup ⇒ v1: Car, registration="B2" — for r1: Reservation, reference="Nottingham _2" b1: Branch, city ="Nottingham" — pickup	b1:Branch - 77, 82, 84, 96 v1:Car - 84 r1:Reservation - 74, 77, 82, 84, 96
4	dropoffCar ("Nottingham_2")	No return v1: Car, registration="B2" — for r1: Reservation, reference="Nottingham _2" c1: Client, cID="Nottingham_0", cName="Reiko" — made b2: Branch, city ="Birmingham" — dropoff ⇒ at — v1: Car, registration="B2" r1: Reservation, reference="Nottingham _2" c1: Client, cID="Nottingham_0", cName="Reiko" — made b2: Branch, city ="Birmingham"	b2:Branch - 108 v1:Car - 113 c1:Client - 108 r1:Reservation - 105, 108, 113, 115, 116

Test Report 5

Step	Operation invocation	Extracted visual contracts	Access in the code *line number*
1	registerClient("Birmingham", "Reiko")	Return : " Birmingham _0" **b1: Branch** city ="Birmingham " cMax = 2 → **b1 : Branch** city ="Birmingham " cMax = 2 / of ↓ **c1: Client** cID="Birmingham _0" cName="Reiko "	b1:Branch - 6, 11, 13 c1:Client - 9, 10, 11, 14
2	registerClient("Birmingham ", "Abdullah")	Return : " Birmingham _1" **b1: Branch** city ="Birmingham " cMax = 2 → **b1 : Branch** city ="Birmingham " cMax = 2 / of ↓ **c2: Client** cID="Birmingham _1" cName="Abdullah"	b1:Branch - 6, 11, 13 c2:Client - 9, 10, 11, 14
3	makeReservation("Birmingham_0", "Birmingham", "Birmingham")	Return : null **b1: Branch** city ="Birmingham" rMax = 0 / of ↓ **c1: Client** cID="Birmingham _0" cName="Reiko " / **b2: Branch** city ="Birmingham" → **b1: Branch** city ="Birmingham" rMax = 0 / of ↓ **c1: Client** cID="Birmingham _0" cName="Reiko " / **b2: Branch** city ="Birmingham"	b1: Branch - 21, 24 b2: Branch - 22 c1:Client -24
4	makeReservation("Birmingham_1", "Birmingham", "Leicester")	Return : null **b1: Branch** city ="Birmingham" rMax = 0 / of ↓ **c2: Client** cID="Birmingham _1" cName="Abdullah" / **b3: Branch** city ="Leicester" → **b1: Branch** city ="Birmingham" rMax = 0 / of ↓ **c2: Client** cID="Birmingham _1" cName="Abdullah" / **b3: Branch** city ="Leicester"	b1: Branch - 21, 24 b2: Branch - 22 c1:Client -24