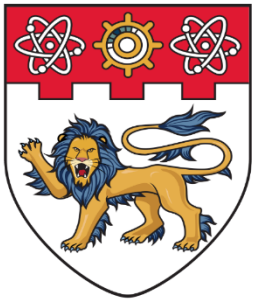


NANYANG TECHNOLOGICAL UNIVERSITY
SINGAPORE

SC2006 – Software Engineering

Lab 4 Test Case and Results

Contents

Black Box Testing

CreateNewJobInterface

Control Class – CreateNewJobInterface

CreateNewJobinterface also serve is responsible for **Job Creation**. When the operator wants to create a new job to be added to the waiting list. The operator will first need to enter a valid ***postal code*** which will be verified with internal checks and OneMap API to ensure its validity. If it is found, the address and block number will be filled in where by the operator can then fill the remainder of the fields whenever appropriate.

Equivalence Partitioning & Boundary Value Analysis

Equivalence Partitioning

Equivalence Partitioning is a black box technique used by software testers to reduce the number of test cases while maintaining effective test coverage.

Valid Equivalence Class

- Valid Format (integer) -> Takes precedence over other validation
- Valid Digits -> Takes precedence over other validation except formatting
    - 6 Digits
- Valid Sectors Code (First 2 digits of postal code) (Singpost, 2024)
    - Continuous Value
    - 01 - 81
- Valid Delivery Point (Last 4 digits of postal code)
    - Discrete Values
    - If the block exists within the sector

Invalid Equivalence Class

- Invalid Format
    - Alphabets (a,A,h,H)
    - Special Characters (#, ! , ?)
- Invalid Digits
    - 0 to 5 digits, 7 to inf digits
- Invalid Sectors code
    - 00, 82 to 99
- Invalid Delivery Point
    - Block does not have a sector associated to it

Boundary Value Analysis

Boundary Value Testing tests values at the boundary and is only applicable to continuous range of values. As the number of digits and sector code are digit and a range of digits on a continuous number line. We will take the edge values.

Invalid Digits

- Less than or equal 5, More than or equal to 7
- Boundary Values are 5 and 7

Invalid Sector Code

- Less than 01, More than 81
- Boundary Values are 00 and 82

Test Cases

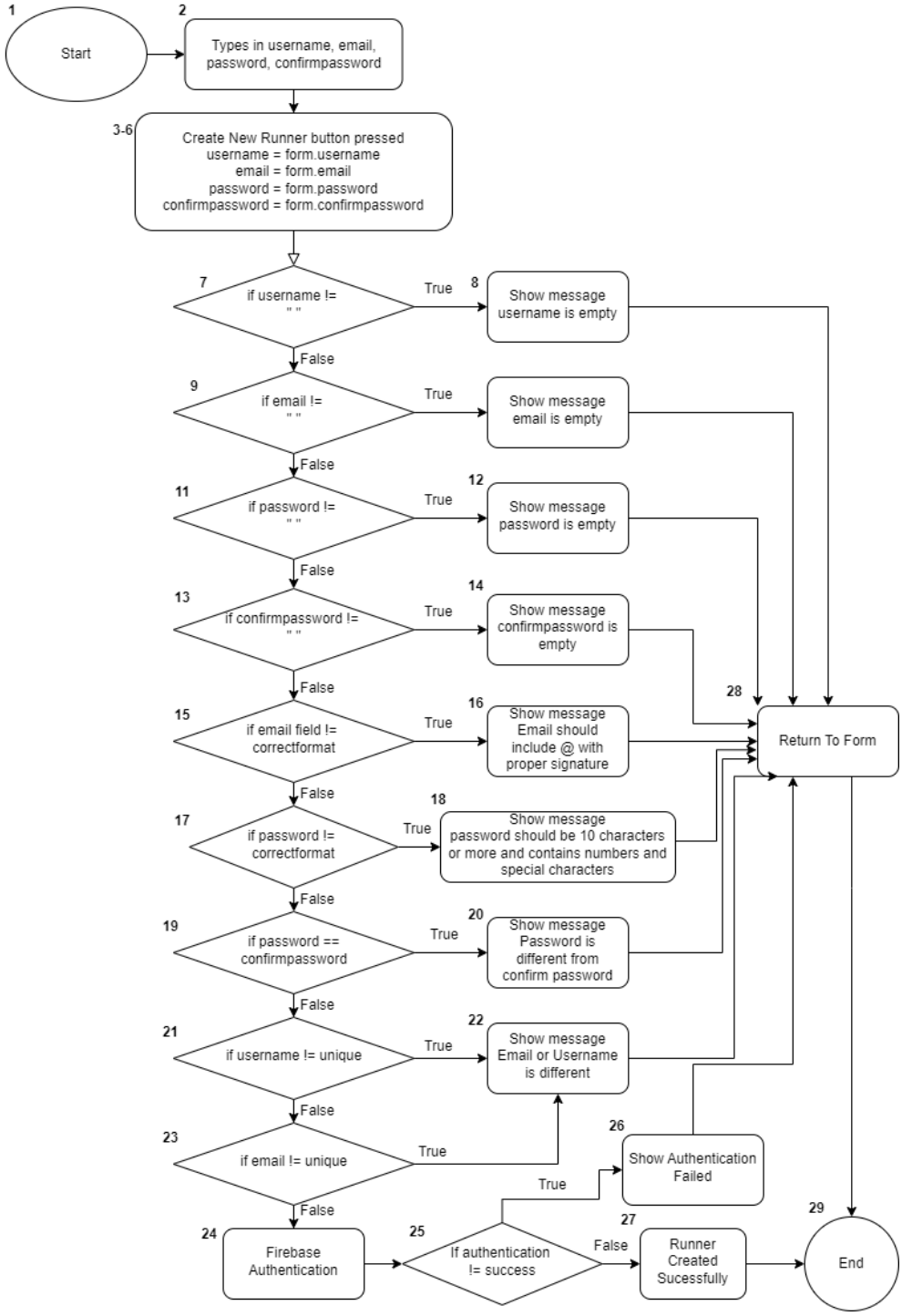
Test No.	Test Input	Parameter	Expected Output	Actual Output	Success
1	Postal Code abcdef	Invalid Format (Characters)	Failed. Please key in a numerical postal code	Failed. Please key in a numerical postal code	True
2	Postal Code 57015!	Invalid Format (Special Characters)	Failed. Please key in a numerical postal code	Failed. Please key in a numerical postal code	True
3	Postal Code 57015	Valid Format Invalid Digits (Lower Bound)	Failed. Please key in a 6-digit postal code	Failed. Please key in a 6-digit postal code	True
4	Postal Code 8570157	Valid Format Invalid Digits (Upper Bound)	Failed. Please key in a 6-digit postal code	Failed. Please key in a 6-digit postal code	True
5	Postal Code 005780	Valid Format Valid Digits Invalid Sector Code (Lower Bound)	Failed. Please key in a correct sector code	Failed. Please key in a correct sector code	True
6	Postal Code 829670	Valid Format Valid Digits Invalid Sector Code (Upper Bound)	Failed. Please key in a correct sector code	Failed. Please key in a correct sector code	True
7	Postal Code 670356	Valid Format Valid Digits Valid Sector Code Invalid Delivery Point	Failed to find delivery point	Failed to find delivery point	True
8	Postal Code 639798	Valid Format Valid Digits Valid Sector Code Valid Delivery Point	Success	Success	True

White Box Testing

White box testing is the method used to test the software by developers. As such that 2 classes that will be tested are createnewrunner and completejob. The technique that will be used is Control Flow Testing.

CreateNewRunner

Control Flow Graph



Basic Path Testing

Level 3 – Basis Path Coverage

Cyclomatic Complexity

CC = | Decision Point + 1 | = 10 Decision Points + 1 = 11

Basis Paths

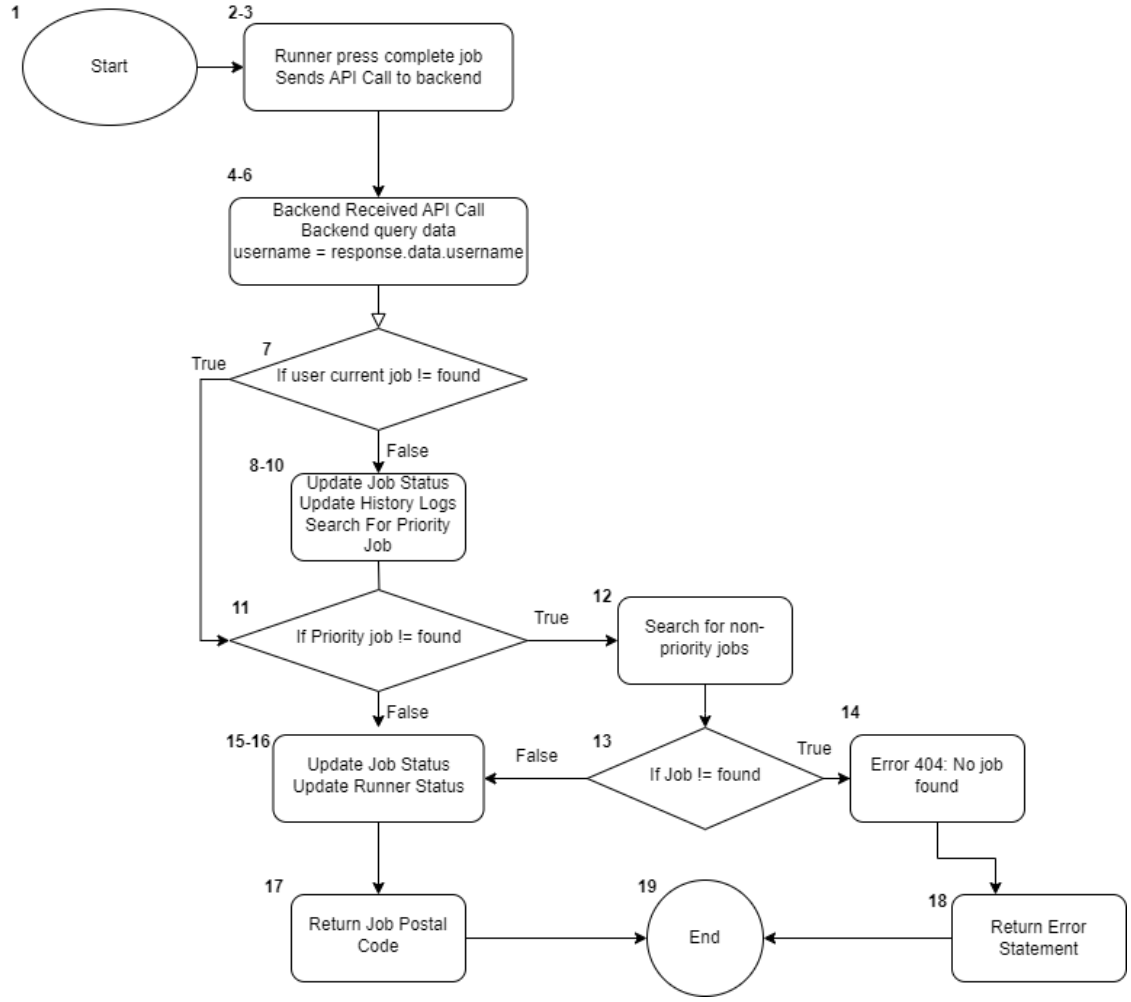
1. Baseline Path: 1-6,7,9,11,13,15,17,19,21,23,24,25,27,29
2. Basis Path 2: 1-6,7,8,28,29
3. Basis Path 3: 1-6,7,9,10,28,29
4. Basis Path 4: 1-6,7,9,11,12,28,29
5. Basis Path 5: 1-6,7,9,11,13,14,28,29
6. Basis Path 6: 1-6,7,9,11,13,15,16,28,29
7. Basis Path 7: 1-6,7,9,11,13,15,17,18,28,29
8. Basis Path 8: 1-6,7,9,11,13,15,17,19,20,28,29
9. Basis Path 9: 1-6,7,9,11,13,15,17,19,21,22,28,29
10. Basis Path 10: 1-6,7,9,11,13,15,17,19,21,23,22,28,29
11. Basis path 11: 1-6,7,9,11,13,15,17,19,21,23,24,25,26,28,29

Test Case

Test No.	Condition	Expected Output	Actual Output	Success
1	Fields all correct	Runner Create Successfully	Runner Create Successfully	True
2	Username == Empty	Show message username is empty	Show message username is empty	True
3	Email == Empty	Show message email is empty	Show message email is empty	True
4	Password == Empty	Show message password is empty	Show message password is empty	True
5	ConfirmPassword == Empty	Show message confirmpassword is empty	Show message confirmpassword is empty	True
6	Email field == Incorrect	Show message Email should include @ with proper signature	Show message Email should include @ with proper signature	True
7	Password field == Incorrect	Show messagepassword should be 10 characters or more and contains numbers and special characters	Show message password should be 10 characters or more and contains numbers and special characters	True
8	Password != ConfirmPassword	Show message Password is different from confirm password	Show message Password is different from confirm password	True
9	Username != Unique	Show message Email or Username is different	Show message Email or Username is different	True
10	Email != Unique	Show message Email or Username is different	Show message Email or Username is different	True
11	Authentication Failed	Show Authentication Failed	Show Authentication Failed	True

Complete Job

Control Flow Graph



Basic Path Testing

Level 3 – Basis Path Coverage

Cyclomatic Complexity

CC = | Decision Point + 1 | = 3 Decision Points + 1 = 4

Basis Paths

1. Baseline Path: 1-6,7,9-11,12,16-18,20
2. Basis Path 2: 1-6,7,8,19,20
3. Basis Path 3: 1-6,7,9-11,12,13,14,15,19,20
4. Basis Path 4: 1-6,7,9-11,12,13,14,16-18,20

Test Case

Test No.	Parameters	Expected Output	Actual Output	Success
1	Current Job Found. Priority Job Found	Return Job Postal Code	Return Job Postal Code	True
2	Current Job not Found	Error 404: User no job assigned	Error 404: User no job assigned	True
3	Current Job Found, Priority Job Not Found, Job Not Found	Error 404: No job found	Error 404: No job found	True
4	Current Job Found, Priority job not found, Job Found	Return Job Postal Code	Return Job Postal Code	True

References

Singpost. (2024). *List of Postal Districts.* Retrieved from List of Postal Districts: https://www.ura.gov.sg/Corporate/-/media/Corporate/Property/PMI-Online/List_Of_Postal_Districts.pdf