1. Introduction

For black box testing, we have decided to test the Filter control class (Section 2). For white box testing, we have chosen to test the Register() and Login() function in AuthenticationManager (Section 3)

2. Black Box Testing

Field	Valid Test Values	Invalid Test Values	Notes
Search	• NULL • Any Alphabet	• Any Special Characters and/or Numbers	Applicable in filtering for all school types
ELR2B2	• NULL • Any Numbers from 4 to 26	• Any Number from 0 to 3 • Any Number from 21 to 100	Exists only in filter for polytechnic courses
ARTS Score	• NULL • Any Numbers from 4 to 20	• Any Number from 0 to 3 • Any Number from 21 to 100	Exist only in filter for junior colleges
SCI Score	• NULL • Any Numbers from 4 to 20	• Any Number from 0 to 3 • Any Number from 21 to 100	
COMM Score	• NULL • Any Numbers from 4 to 20	• Any Number from 0 to 3 • Any Number from 21 to 100	
BACC Score	• NULL • Any Numbers from 4 to 20	• Any Number from 0 to 3 • Any Number from 21 to 100	

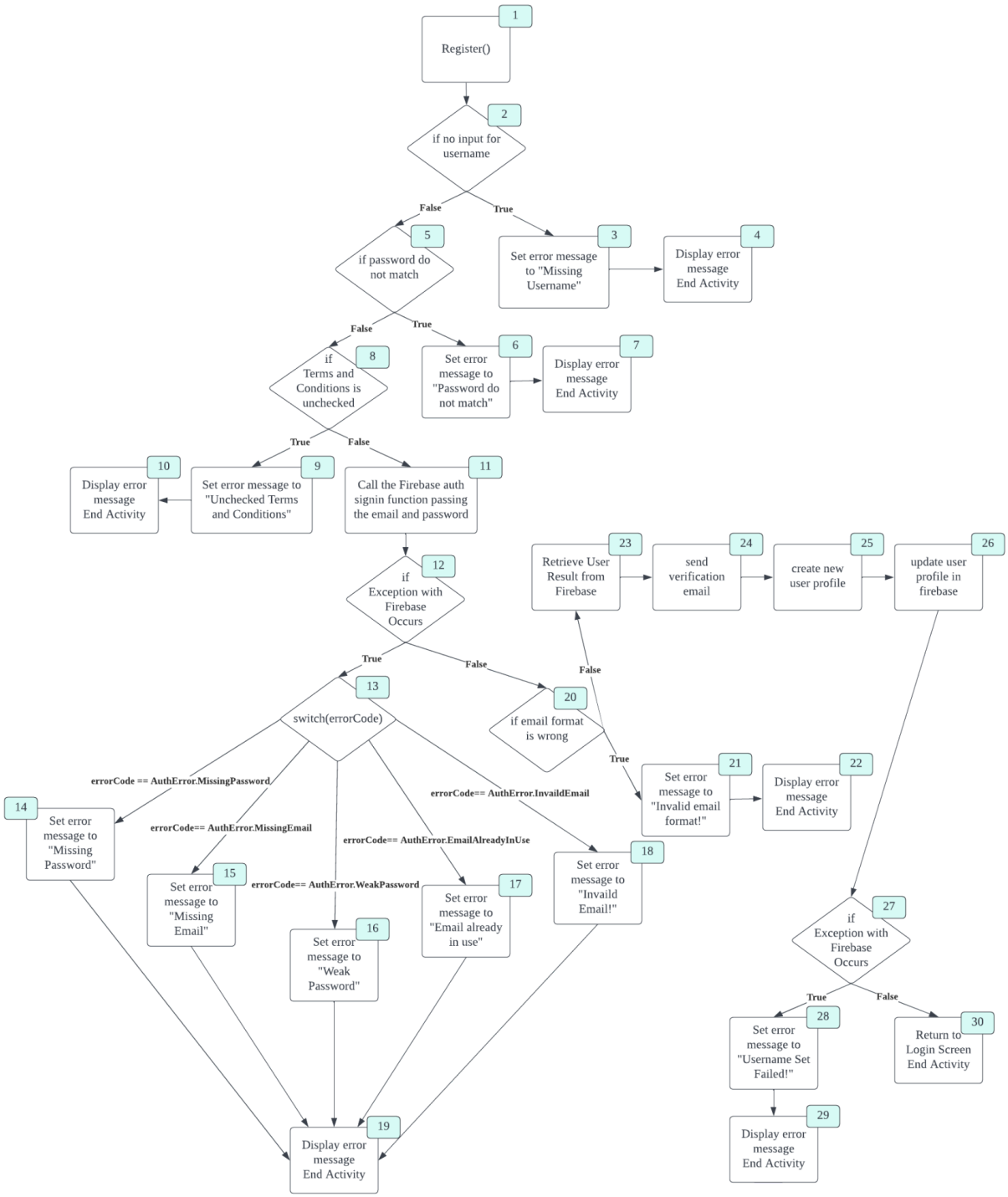
Final Test Cases:

	Search	Polytechnic Score (ELR2B2)	Junior College Score (ARTS, SCI, COMM, BACC)
Valid	Dunman, NULL	4, 26	4, 20
Invalid	123	0, 3, 27, 100, 101	0, 3, 31, 100, 101

#	Input							Ouput	
	Search	ELR2B2	ARTS Score	SCI Score	COMM Score	BACC Score	Expected	Actual	Approval
1	Dunman	-	-	-	-	-	Result = True	Result = True	Y
2	123	-	-	-	-	-	Result = False (No Result)	Result = False (No Result)	Y
3	NULL	-	-	-	-	-	Result = True	Result = True	Y
4	NULL	-1	NULL	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
5	NULL	0	NULL	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
6	NULL	3	NULL	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
7	NULL	4	NULL	NULL	NULL	NULL	Result = True	Result = True	Y
8	NULL	26	NULL	NULL	NULL	NULL	Result = True	Result = True	Y
9	NULL	27	NULL	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
10	NULL	100	NULL	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
11	NULL	101	NULL	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
12	NULL	-	NULL	NULL	NULL	NULL	Result = True	Result = True	Y
13	NULL	-	-1	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
14	NULL	-	0	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
15	NULL	-	3	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
16	NULL	-	4	NULL	NULL	NULL	Result = True	Result = True	Y
17	NULL	-	20	NULL	NULL	NULL	Result = True	Result = True	Y
18	NULL	-	21	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
19	NULL	-	100	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
20	NULL	-	101	NULL	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
21	NULL	-	NULL	NULL	NULL	NULL	Result = True	Result = True	Y
22	NULL	-	NULL	-1	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
23	NULL	-	NULL	0	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
24	NULL	-	NULL	3	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
25	NULL	-	NULL	4	NULL	NULL	Result = True	Result = True	Y
26	NULL	-	NULL	20	NULL	NULL	Result = True	Result = True	Y
27	NULL	-	NULL	21	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
28	NULL	-	NULL	100	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
29	NULL	-	NULL	101	NULL	NULL	Result = False (No Result)	Result = False (No Result)	Y
30	NULL	-	NULL	NULL	NULL	NULL	Result = True	Result = True	Y
31	NULL	-	NULL	NULL	-1	NULL	Result = False (No Result)	Result = False (No Result)	Y
32	NULL	-	NULL	NULL	0	NULL	Result = False (No Result)	Result = False (No Result)	Y
33	NULL	-	NULL	NULL	3	NULL	Result = False (No Result)	Result = False (No Result)	Y
34	NULL	-	NULL	NULL	4	NULL	Result = True	Result = True	Y
35	NULL	-	NULL	NULL	20	NULL	Result = True	Result = True	Y
36	NULL	-	NULL	NULL	21	NULL	Result = False (No Result)	Result = False (No Result)	Y
37	NULL	-	NULL	NULL	100	NULL	Result = False (No Result)	Result = False (No Result)	Y
38	NULL	-	NULL	NULL	101	NULL	Result = False (No Result)	Result = False (No Result)	Y
39	NULL	-	NULL	NULL	NULL	NULL	Result = True	Result = True	Y
40	NULL	-	NULL	NULL	NULL	-1	Result = False (No Result)	Result = False (No Result)	Y
41	NULL	-	NULL	NULL	NULL	0	Result = False (No Result)	Result = False (No Result)	Y
42	NULL	-	NULL	NULL	NULL	3	Result = False (No Result)	Result = False (No Result)	Y
43	NULL	-	NULL	NULL	NULL	4	Result = True	Result = True	Y
44	NULL	-	NULL	NULL	NULL	20	Result = True	Result = True	Y
45	NULL	-	NULL	NULL	NULL	21	Result = False (No Result)	Result = False (No Result)	Y
46	NULL	-	NULL	NULL	NULL	100	Result = False (No Result)	Result = False (No Result)	Y
47	NULL	-	NULL	NULL	NULL	101	Result = False (No Result)	Result = False (No Result)	Y

3. White Box Testing

3.1. Register() in AuthManager



Basis:

a) 1, 2, 5, 8, 11, 12, 20, 23, 24, 25, 26, 27, 30
b) 1, 2, 3, 4
c) 1, 2, 5, 6, 7
d) 1, 2, 5, 8, 9, 10
e) 1, 2, 5, 8, 11, 12, 13, 14, 19
f) 1, 2, 5, 8, 11, 12, 13, 15, 19
g) 1, 2, 5, 8, 11, 12, 13, 16, 19
h) 1, 2, 5, 8, 11, 12, 13, 17, 19
i) 1, 2, 5, 8, 11, 12, 20, 23, 24, 25, 26, 27, 30
j) 1, 2, 5, 8, 11, 12, 20, 21, 22
k) 1, 2, 5, 8, 11, 12, 20, 23, 24, 25, 26, 27, 28, 29 **

** - Basis Path K cannot be tested using input parameters. Thus, it will be removed from the test cases.

Test Cases:

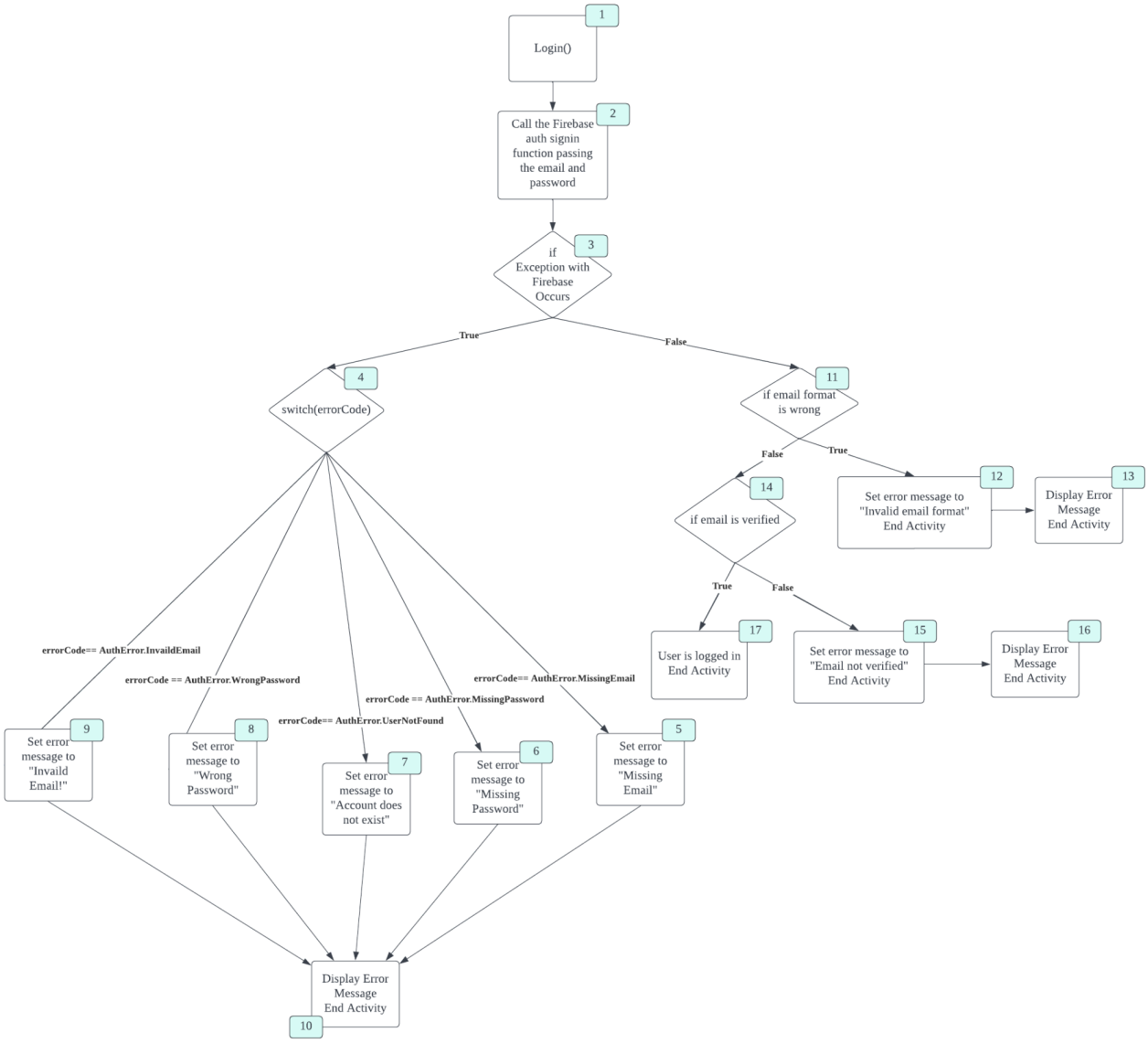
a) User registers a new account after filing in all parameters and with an email that was never used before
b) User registers a new account but forgets to key in a username
c) User mistypes in the second password
d) User forgets to check the box for the terms and conditions
e) User forgets to enter a password
f) User forgets to enter an email
g) User enters “aaa” as their password
h) User creates a new account with an email that has an account linked to it
i) User enters “bbb” as their email
j) User enters “a@a.com” as their email

Execution Paths:

a) 1, 2, 5, 8, 11, 12, 20, 21, 22, 23, 24, 27
b) 1, 2, 3, 4
c) 1, 2, 5, 6, 7
d) 1, 2, 5, 8, 9, 10
e) 1, 2, 5, 8, 11, 12, 13, 14, 19
f) 1, 2, 5, 8, 11, 12, 13, 15, 19
g) 1, 2, 5, 8, 11, 12, 13, 16, 19
h) 1, 2, 5, 8, 11, 12, 13, 17, 19
i) 1, 2, 5, 8, 11, 12, 13, 18, 19
j) 1, 2, 5, 8, 11, 12, 20, 21, 22, 23, 24, 25, 26

Cyclomatic Complexity: [Conditions + 1] = 6 + (5 - 1) + 1 = 11
Special Note: The decision node representing the switch case is not counted as 1, instead it is counted as (k - 1) where k is the number of arrows leaving the decision node. In this case, there are 5 arrows pointing out of the particular decision node. Thus, k = 5.

3.2. Login() in AuthManager



Basis:

a) 1, 2, 3, 11, 14, 17
b) 1, 2, 3, 4, 5, 10
c) 1, 2, 3, 4, 6, 10
d) 1, 2, 3, 4, 7, 10
e) 1, 2, 3, 4, 8, 10
f) 1, 2, 3, 4, 9, 10
g) 1, 2, 3, 11, 12, 13
h) 1, 2, 3, 11, 14, 15, 16

Test Cases:

a) User logins in with a verified email and the corresponding password for the account
b) User forgets to enter an email
c) User forgets to enter a password
d) User logins in with an email that has never been used to create an account
e) User mistypes the password
f) User enters “aaa” as their email
g) User enters “b@b.com” as their email
h) User logins in with an unverified email

Execution Paths:

a) 1, 2, 3, 11, 14, 17
b) 1, 2, 3, 4, 5, 10
c) 1, 2, 3, 4, 6, 10
d) 1, 2, 3, 4, 7, 10
e) 1, 2, 3, 4, 8, 10
f) 1, 2, 3, 4, 9, 10
g) 1, 2, 3, 11, 12, 13
h) 1, 2, 3, 11, 14, 15, 16

Cyclomatic Complexity: [Conditions + 1] = 3 + (5 - 1) + 1 = 8
Special Note: The decision node representing the switch case is not counted as 1, instead it is counted as (k - 1) where k is the number of arrows leaving the decision node. In this case, there are 5 arrows pointing out of the particular decision node. Thus, k = 5.