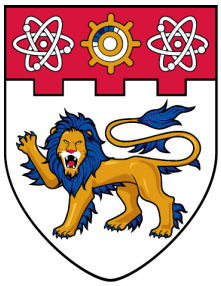

NANYANG TECHNOLOGICAL UNIVERSITY
SINGAPORE

College of Computing and Data Science

SC2006 - Software Engineering

Lab 4 Deliverables

FDAB Team 1

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1. Black Box Testing

I. AuthenticationController

Control class to test - **AuthenticationController**
The AuthenticationController class manages user authentication within the application, covering both user registration (signup) and user login.

The AuthenticationController is a crucial component responsible for managing user authentication within the application. The controller gathers the user's email address and password when they try to log in. It then verifies that the input data is correct, guaranteeing the quality and integrity of the data supplied. To authenticate the user, the controller retrieves the hashed password associated with the provided email from the database. The user's supplied password is then compared with the hashed password that was recovered. The user will be taken to the home screen if the comparison yields a match, indicating successful authentication. Information managed by the AuthenticationController in the login process includes email and password.

The AuthenticationController is also in charge of user registration. The controller will make sure that all necessary information is gathered when a new user registers for the application, verifying the accuracy and completeness of the input data. Prior to storing the user’s password in the database, the password will undergo a secure hashing process. The AuthenticationController will also generate a user ID and assign it to the newly registered user. This distinct identity turns into a crucial component for organizing and differentiating user data.

II. Equivalence Class and Boundary Value Testing

Equivalence Class Testing

A basic black-box test design technique in which test cases are designed to execute representatives from equivalence partitions. Sections of an input or output domain are known as equivalency classes, or partitions. It is expected that each member of a partition class behaves in the same way as the others. Every partition is covered at least once in the test cases.

Equivalence partitioning is the process of dividing a set (domain) into two or more disjoint sets, with each subset's members sharing a common characteristic, i.e. produces the same output, or if one value catches a bug the others probably will do, or if one value does not catch a bug, the others will probably not either. Members of other subsets do not share this characteristic. Valid equivalence classes describe valid situations and the system should handle them normally. Invalid equivalence classes describe invalid situations and the system should reject them.

Boundary Value Testing

Boundary Value Testing is an extension of equivalence partitioning and applies only when the members of an equivalence class are ordered. Its major objective is to test the input domain's limits. It examines the system's behavior at the boundaries or extremes of permissible input values.

1. Login Function
Valid Equivalence Class: Usernames and passwords with correct formats.
Invalid equivalence Class: Usernames and passwords with incorrect formats or missing information.

2. Sign up function
Valid Equivalence Class: Name, Email, Address, Contact Number, Password, Confirm Password with correct formats
Invalid Equivalence Class: Name, Email, Address, Contact Number, Password, Confirm Password with incorrect formats or missing information

III. Test Cases and Results

1. Login

Input parameters: Email and Password

No.	Test Input	Expected Output	Actual Output	Pass?
1.	**(Valid)** Email: “fdabteamone@gmail.com” **(Valid)** Password: “Password”	Successful login	Successful login	Yes
2.	**(Invalid)** Email: “” **(Valid)** Password: “Password”	Login failed. System notify “Please enter your email and password!”	Login failed. System notify “Please enter your email and password!”	Yes
3.	**(Invalid)** Email: “test123” **(Valid)** Password: “Password”	Login failed. System notify “Please include an @ in your email.”	Login failed. System notify “Please include an @ in your email.”	Yes
4.	**(Valid)** Email: “fdabteamone@gmail.com” **(Invalid)** Password: “”	Login failed. System notify “Please enter your email and password!”	Login failed. System notify “Please enter your email and password!”	Yes
5.	**(Valid)** Email: “fdabteamone@gmail.com” **(Invalid)** Password: “Pass123”	Login failed. System notify “Password length must be at least 8 characters long!”	Login failed. System notify “Password length must be at least 8 characters long!”	Yes

2. Sign up

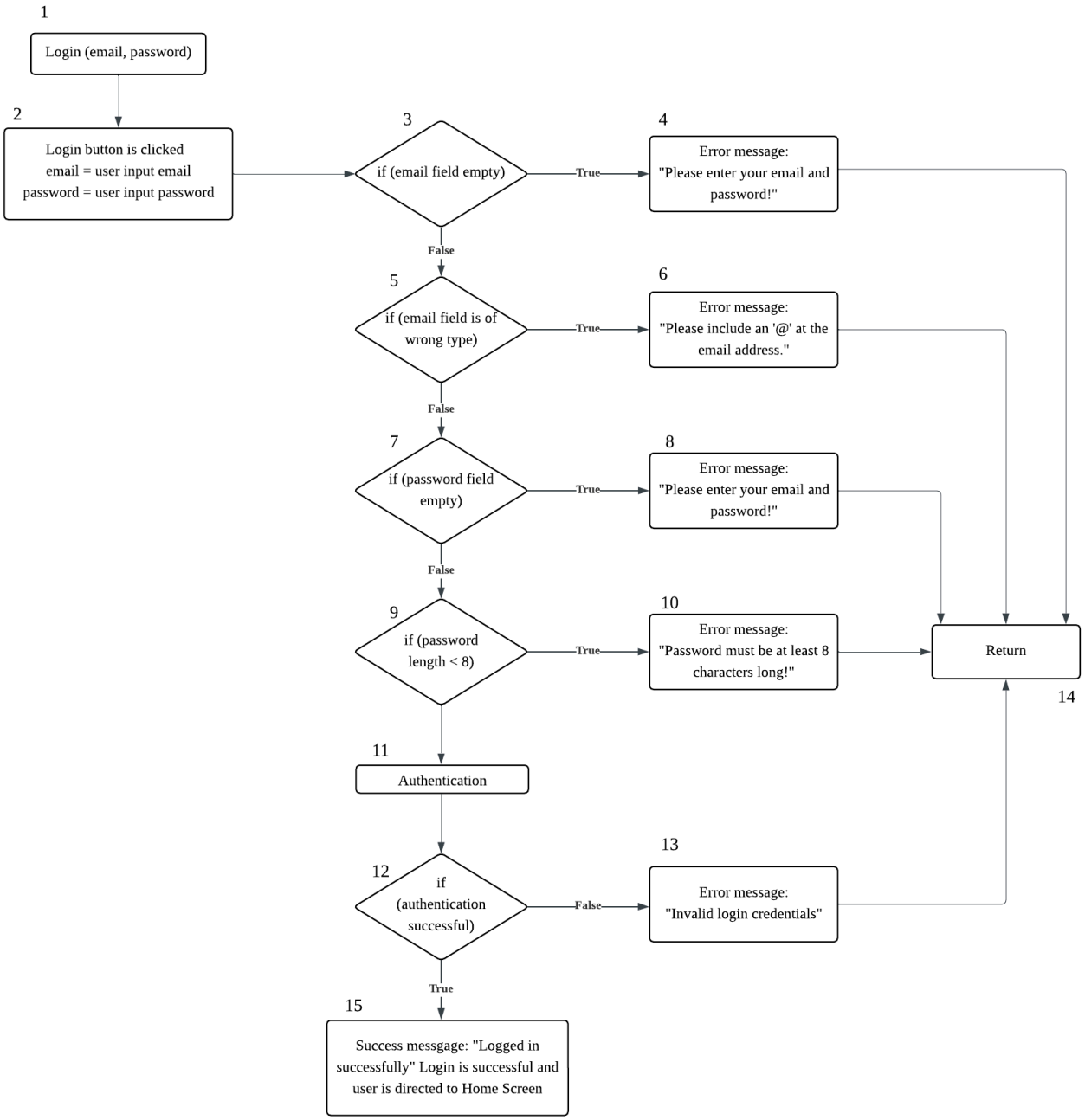
Input parameters: Username, Email, Gender, Password

No.	Test Input	Expected Output	Actual Output	Pass?
1.	**(All Valid Inputs)** Username: “fdabteamone” Email: “fdabteamone@gmail.com” Gender: Female Password: “Password” Confirm Password: “Password”	Successful signup	Successful signup	Yes
2.	**(All Valid Inputs except Username)** Username: “”	System notify “Please input all the fields”	System notify “Please input all the fields”	Yes
3.	**(All Valid Inputs except Email)** Email: “”	System notify “Please input all the fields”	System notify “Please input all the fields”	Yes
4.	**(All Valid Inputs except Gender)** Gender: “”	System notify “Please input all the fields”	System notify “Please input all the fields”	Yes
5.	**(All Valid Inputs except Password)** Password: “”	System notify “Please input all the fields”	System notify “Please input all the fields”	Yes
6.	**(All Valid Inputs except Confirm Password)** Password: “pass123”	System notify “Password length must be at least 8 characters long!”	System notify “Password length must be at least 8 characters long!”	Yes
7.	**(All Valid Inputs except Confirm Password)** Confirm Password: “”	System notify “Please input all the fields”	System notify “Please input all the fields”	Yes
8.	**(All Valid Inputs except Confirm Password)** Password: “Password” Confirm Password: “Pass”	System notify “Password and Confirm Password do not match”	System notify “Password and Confirm Password do not match”	Yes

2. White Box Testing

I. Login

I.I Control Flow Graph



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I.II Basic Path Testing

Cyclomatic complexity = |decision points| + 1 = 5 + 1 = 6

Basis Paths:

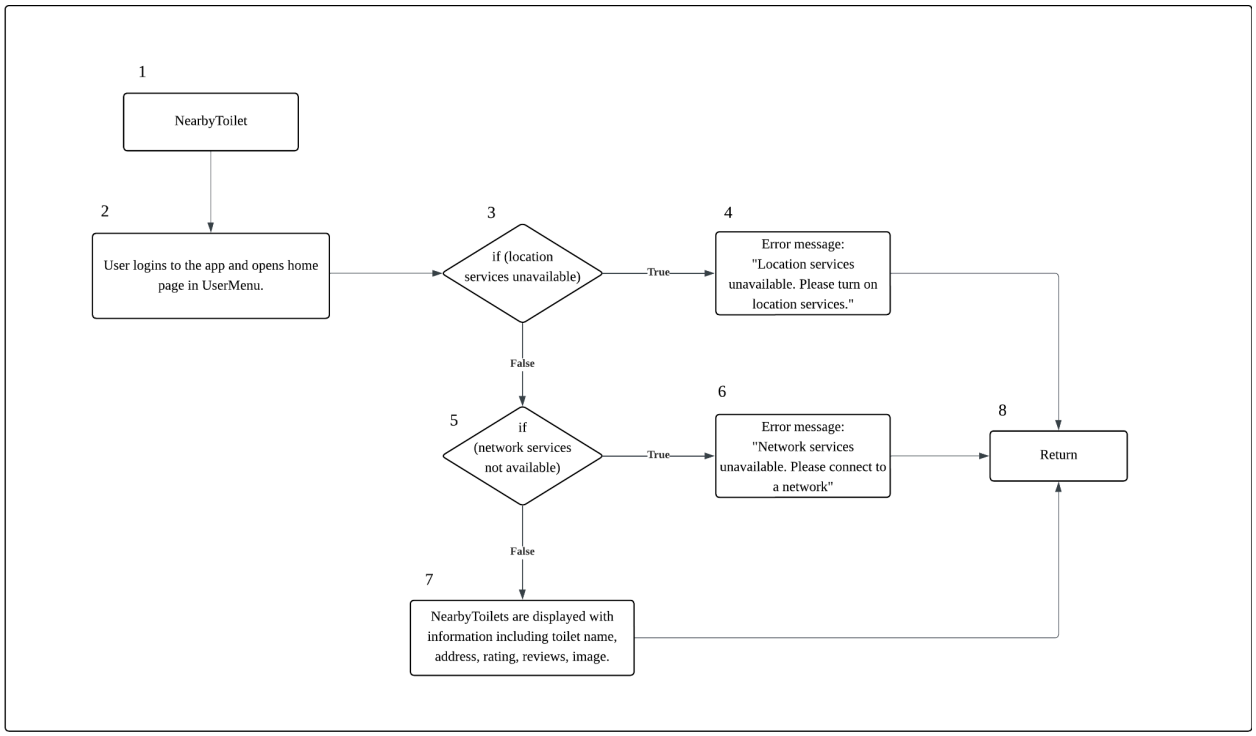
1. Baseline path: 1,2,3,5,7,9,11,12,15
2. Basis path 2: 1,2,3,4,14
3. Basis path 3: 1,2,3,5,6,14
4. Basis path 4: 1,2,3,5,7,8,14
5. Basis path 5: 1,2,3,5,7,9,10,14
6. Basis path 6: 1,2,3,5,7,9,11,12,13,14

I.III Test Cases and Results

No.	Test Input	Expected Output	Actual Output	Pass?
1.	Email: “fdabteamone@gmail.com” Password: “Password”	“Logged in successfully”	“Logged in successfully”	Yes
2.	Email: “” Password: “Password”	“Please enter your email and password!”	“Please enter your email and password!”	Yes
3.	Email: “test123” Password: “Password”	“Please include an @ in your email.”	“Please include an @ in your email.”	Yes
4.	Email: “fdabteamone@gmail.com” Password: “”	“Please enter your email and password!”	“Please enter your email and password!”	Yes
5.	Email: “fdabteamone@gmail.com” Password: “Pass123”	“Password length must be at least 8 characters long!”	“Password length must be at least 8 characters long!”	Yes
6.	Email: “fdabteamone@gmail.com” Password: “123333”	“Invalid login credentials”	“Invalid login credentials”	Yes

I. NearbyToilet

I.I Control Flow Graph



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I.II Basic Path Testing

Cyclomatic Complexity = | decision points | + 1 = 2 + 1 = 3

Basis Paths:

1. Baseline path: 1,2,3,5,7,8
2. Basis path 2: 1,2,3,4,8
3. Basis path 3: 1,2,3,5,6,8

I.III Test Cases and Results

NearbyToilet

No.	Test Input	Expected Output	Actual Output	Pass?
1.	Location services available. Network services available.	Nearby Toilets displayed successfully.	Nearby Toilets displayed successfully.	Yes
2.	Location services unavailable. Network services available.	Error message: "Location services unavailable. Please turn on location services."	Error message: "Location services unavailable. Please turn on location services."	Yes
3.	Location services available. Network services unavailable.	Error message: "Network services unavailable. Please connect to a network"	Error message: "Network services unavailable. Please connect to a network"	Yes