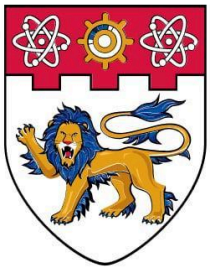


NANYANG TECHNOLOGICAL UNIVERSITY
SINGAPORE

SC2006 – Software Engineering
Lab 1 Deliverables

Lab Group	SDAB
Team Name	BuzzTracker
Members	Keysha Chua Xin Sze Choo Wei Boon Leong Joey Parameswaran Sethu Rugma Tang Zhenwei

1. Documentation of functional and non-functional requirements

A. Functional Requirements:

1. User must be able to create an account
    - 1.1. System must provide an account registration form where user needs to enter their details such as preferred username, email address and password.
    - 1.2. System must validate the inputs to check that all fields are filled correctly.
    - 1.3. System must display error messages for invalid input (eg, passwords do not match, username is already taken)
    - 1.4. After the sign up process, system must redirect user to login page.

2. System must display real-time dengue cases stats
    - 2.1. System must retrieve dengue cases stats from NEA

3. System must display the tips on how to avoid breeding of mosquitoes (B-L-O-C-K and Self-Protection)

4. System must track if the user has dengue in a database
    - 4.1. User must be able to report if they have dengue
        - 4.1.1. System must record the user's frequently visited locations if the user has dengue
    - 4.2. User must be able to input their dengue symptoms
    - 4.3. System must provide guidance on how to recover from dengue and a list of chas clinics that are near them.

5. System must display if the user has dengue and the user's dengue case detail, if any

6. System must be able to send infection risk notifications
    - 6.1. System must send a notification if the user has entered a dengue cluster
    - 6.2. System must send a notification if there are over 5 dengue cases within 200 metres of the user

7. System must be able to visualise dengue hotspots, breeding sites, and clinics in a map
    - 7.1. System must visualise the dengue clusters in heatmap (reference: https://www.nea.gov.sg/dengue-zika/dengue/dengue-clusters)
        - 7.1.1. System must aggregate the clustering data from NEA and system database

7.2. System must visualise the locations and areas of mosquito breeding sites in dots with areas (reference: https://www.nea.gov.sg/dengue-zika/Aedes)
    7.2.1. System must retrieve mosquito breeding habitats data from NEA
7.3. System must visualise the locations of clinics/hospitals in dots/pins
    7.3.1. System must retrieve locations of CHAS clinics and filter out clinics in the Medical category from the list
    7.3.2. System must retrieve locations of acute hospitals from HealthHub

B. Non-Functional Requirements

1. Performance

1.1. Application must be able to load within 3 seconds
1.2. Application should be able to handle multiple user request simultaneously

2. Reliability

2.1. Application must be up 99.9% of the time
2.2. Application should only perform maintenance during off peak hours

2. Data Dictionary:

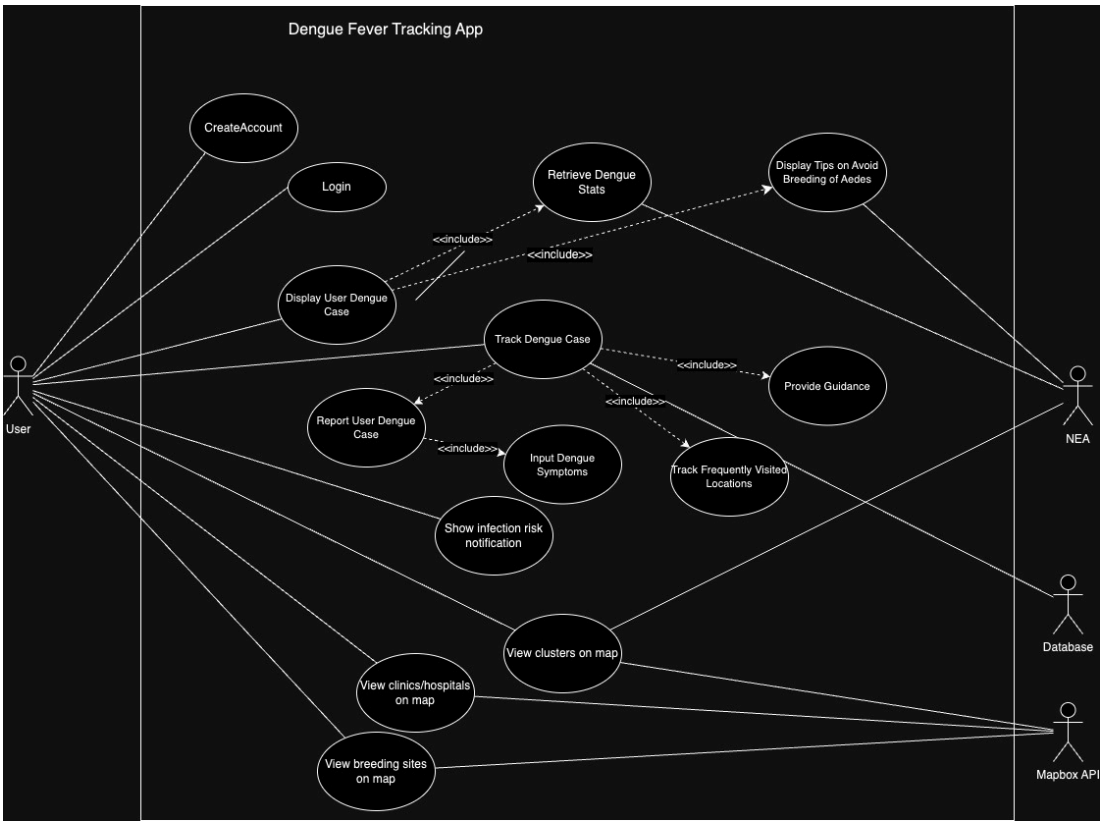
Term	Definition
Dengue	It is a disease that is specifically spread to humans through the bite of an infected mosquito which can cause multiple complications such as joint pain, fever and more.
Dengue Case	A situation where a user has been infected with the dengue virus
Dengue Case Stats	Statistical data by NEA showing number of reported dengue cases
Dengue Cluster	An area where a large number of cases have been reported indicating a possible outbreak of the virus

Tip	The users will be provided useful suggestions to combat the dengue issue.
Guidance	The users will be guided on the necessary steps to undertake via the application.
User	The person who uses the application which includes the general public and healthcare workers.
Hotspot	A geographical location where there is a high density of dengue cases.
Breeding Sites	Location where mosquito breeds and lays eggs
Database	The database stores and organises the recorded data for the dengue status of the user
Notification	The notification will be sent from the application to alert the user if the dengue cases were to reach a specific threshold
Clinic	The clinic is where people will receive medical treatment for the virus
Map	The map is of a visual representation to view specific locations
CHAS clinics	Clinics participating in the Community Health Assist Scheme (CHAS), where subsidised healthcare services are provided.
Heatmap	A visual representation of the intensity of dengue cases by denoting them with colour gradients.
Acute Hospitals	Hospitals that can provide emergency care and whose locations are provided in the application for users who need immediate treatment.
User Registration	The process of creating an account in the application so that users will be able to receive notifications and alerts about the dengue clusters nearby.
User Authentication	Verifying process to ensure that the user's personal data and information remains secured in the application.
Performance	The speed and efficiency of the system with which it can retrieve and display data and information.
Symptom	It is a health indicator where the user may make a report when having conditions such as joint pain and more.

National Environment Agency (NEA)	The NEA is a government agency which is accountable for providing information regarding dengue's mosquito breeding sites, clusters and cases within Singapore.
Break, Life, Overturn, Change, Keep (B-L-O-C-K)	It helps the user to prevent the mosquitoes from breeding with the assistance of B-L-O-C-K.

3. Initial Use Case Model, consisting of Use Case diagram and Use Case descriptions

A. Use Case Diagram



B. Use Case Description

1. For Functional Requirements #1

1.1. User Registration

Use Case ID:	1.1		
Use Case Name:	User Registration		
Created By:	Keysha	Last Updated By:	Choo Wei Boon
Date Created:	9/9/2024	Date Last Updated:	9/9/2024

Actor:	User
Description:	To allow users to create an account in BuzzTracker
Preconditions:	None
Postconditions:	None
Priority:	High
Frequency of Use:	Frequent
Flow of Events:	1. The system prompts User to enter their Username, Email Address and Password. 2. The User enters the information needed and clicks on “Sign up”. 3. An account is created for the User.
Alternative Flows:	1.AF.2. 1. If User clicks on “Login here” instead, they get redirected to the Login page.
Exceptions:	1.AF.2. 1. If User clicks on “Login here” instead, they get redirected to the Login page.
Includes:	NIL
Special Requirements:	NIL
Assumptions:	Assumes that User does not have an existing account.
Notes and Issues:	NIL

1.2. User Login

Use Case ID:	1.2		
Use Case Name:	User Login		
Created By:	Keysha	Last Updated By:	
Date Created:	9/9/2024	Date Last Updated:	

Actor:	User
Description:	To allow users to login to their own account on BuzzTracker using their username and password.
Preconditions:	None
Postconditions:	User is logged in into BuzzTracker and is at the homepage of the application.
Priority:	High
Frequency of Use:	Frequent
Flow of Events:	1. The system prompts User to enter their Username and Password. 2. The User enters the information needed and clicks on “Login”.
Alternative Flows:	None
Exceptions:	1.EX.2. 1. If Username and Password does not match, an error message “Username and Password does not match” would be displayed.
Includes:	NIL
Special Requirements:	The system needs to validate user credentials.
Assumptions:	Assumes that User already has an existing account.
Notes and Issues:	NIL

2. Functional Requirements #2

Use Case ID:	2		
Use Case Name:	View Breeding Sites on Map		
Created By:	Choo Wei Boon	Last Updated By:	Choo Wei Boon
Date Created:	9/9/2024	Date Last Updated:	9/9/2024

Actor:	User
Description:	To allow users to visualize and explore dengue breeding sites on a map using the Mapbox API.
Preconditions:	1. The system has successfully connected to the Mapbox API and retrieved the necessary map data. 2. The system has access to a dataset of dengue breeding site locations.
Postconditions:	1. The user has been presented with a map highlighting the severity of dengue cases in each cluster.
Priority:	High
Frequency of Use:	Frequent
Flow of Events:	1. The system starts, and the user navigates to the "Explore" section. 2. The system initializes the Mapbox map centred on the user's location. 3. The system fetches the dataset of dengue breeding site locations. 4. The system iterates through the breeding site data and adds markers to the Mapbox map. 5. User interaction: The user can interact with the map by: 5.1 Zooming in or out to view different levels of detail. 5.2 Panning the map to explore different areas. 5.3 Clicking on a breeding site marker to view more information (e.g. address and number of cases).
Alternative Flows:	2.AF.2. 1. If user's location is not provided, center the map on Singapore
Exceptions:	2.EX.2. 1. If the system encounters errors while communicating with the Mapbox API, it should handle them gracefully, by displaying an error message or retrying the request. 2.EX.3. 1. If the API fails to retrieve data or if there are no current dengue cases, the app should display a message informing the user.
Includes:	NIL

Special Requirements:	NIL
Assumptions:	Assumes that users will have a reliable internet connection to access the app and retrieve data from the API.
Notes and Issues:	NIL

3. Functional Requirements #3

Use Case ID:	3		
Use Case Name:	View Clinics/Hospitals on Map		
Created By:	Choo Wei Boon	Last Updated By:	Choo Wei Boon
Date Created:	9/9/2024	Date Last Updated:	9/9/2024

Actor:	User
Description:	To allow users to visualize and explore the locations of clinics and hospitals on a map using the Mapbox API.
Preconditions:	1. The system has successfully connected to the Mapbox API and retrieved the necessary map data. 2. The system has access to a dataset of clinic and hospital locations.
Postconditions:	1. The user has been presented with a map showing the locations of clinics and hospitals.
Priority:	High
Frequency of Use:	Frequent
Flow of Events:	1. The system starts, and the user navigates to the "Explore" section. 2. The system initializes the Mapbox map centred on the user's location. 3. The system fetches the dataset of clinic and hospital locations. 4. The system iterates through the clinic/hospital data and adds markers of the locations to the Mapbox map. 5. The user can interact with the map by: 5.1. Zooming in or out to view different levels of detail. 5.2. Panning the map to explore different areas. 5.3. Clicking on a clinic/hospital marker to view more information (e.g. address, contact details and opening hours).
Alternative Flows:	3.AF.2. 1. If user's location is not provided, center the map on Singapore. 2. If the user searches for a specific clinic/hospital, center the map on the clinic/hospital.
Exceptions:	3.EX.2. 1. If the system encounters errors while communicating with the Mapbox API, it should handle them gracefully, by displaying an error message or retrying the request. 2. If there are no clinics/hospitals in the current map view, the system should inform the user.

Includes:	NIL
Special Requirements:	NIL
Assumptions:	Assumes that users will have a reliable internet connection to access the app and retrieve data from the API.
Notes and Issues:	NIL

4. Functional Requirements #4

Use Case ID:	4		
Use Case Name:	Track Dengue Case		
Created By:	Tang Zhenwei	Last Updated By:	
Date Created:	8/9/2024	Date Last Updated:	

Actor:	User
Description:	User tracks their own dengue case, symptoms, and frequently visited locations using this use case and system will provide guidance on what to do next.
Preconditions:	1. User has been successfully authenticated.
Postconditions:	1. User dengue case, symptoms, and frequently visited locations has been recorded in database. 2. System has provided guidance on what to do next.
Priority:	Medium
Frequency of Use:	Twice a month ~
Flow of Events:	1. The system uses the included use case Report User Dengue Case to record user's dengue case in database. 2. If the user has dengue case, the system uses the included use case Track Frequently Visited Locations to record user's frequently visited sites in database. 3. On completion of recording the user's dengue case, the system uses the Provide Guidance use case to provide user with latest guidance on what to do next.
Alternative Flows:	4.AF.2. 1. If the user does not have a dengue case, the system goes to normal flow step 3.
Exceptions:	4.EX.1. 1. If the user indicates they have a dengue case but did not tick any symptoms, raise an error to input their dengue symptoms again. 4.EX.2. 1. If there's an exception in recording to database, prompt the user to submit again.
Includes:	4.1. Report User Dengue Case, 4.1.1. Input Dengue Symptoms, 4.2. Track Frequently Visited Locations, 4.3. Provide Guidance
Special Requirements:	User Authentication
Assumptions:	System is able to track user location either by background GPS or user input.

Notes and Issues:	

4.1. Report User Dengue Case

Use Case ID:	4.1		
Use Case Name:	Report User Dengue Case		
Created By:	Tang Zhenwei	Last Updated By:	
Date Created:	8/9/2024	Date Last Updated:	

Actor:	User
Description:	User indicates whether they have a dengue case.
Preconditions:	1. User has started and did not exit from the Track Dengue Case use case flow.
Postconditions:	1. User has indicated whether they have a dengue case.
Priority:	Medium
Frequency of Use:	Twice a month ~
Flow of Events:	1. User indicates whether they have a dengue case. 2. If the user has a dengue case, the system uses the included Input Dengue Symptom use case to record user's symptoms in database.
Alternative Flows:	4.1.AF.2. 1. If the user does not have a dengue case, exit from this use case.
Exceptions:	
Includes:	4.1.1. Input Dengue Symptoms
Special Requirements:	
Assumptions:	This use case is not directly useable by any entity and can only be used if invoked by use case 4. Track Dengue Case.
Notes and Issues:	

4.1.1. Input Dengue Symptoms

Use Case ID:	4.1.1		
Use Case Name:	Input Dengue Symptoms		
Created By:	Tang Zhenwei	Last Updated By:	
Date Created:	8/9/2024	Date Last Updated:	

Actor:	User
Description:	User inputs their dengue symptoms to be recorded in database.
Preconditions:	1. User has started and did not exit from the Track Dengue Case use case flow.
Postconditions:	1. User has ticked at least one symptom.
Priority:	Medium
Frequency of Use:	Once a month ~
Flow of Events:	1. User ticks their symptoms from a list of dengue fever symptoms. 2. User clicks the Close/Done button to complete the input of user dengue symptoms.
Alternative Flows:	4.1.1.AF.2. 1. If the user did not tick any symptoms, prompt the user to choose to re-check their input or exit this use case. 2. If the user chooses to re-check their input, highlight that user must tick at least one symptom and go to normal flow step 1. 4.1.1.AF.2.2. 1. If the user chooses to exit this use case, exit this use case.
Exceptions:	
Includes:	
Special Requirements:	
Assumptions:	This use case is not directly useable by any entity and can only be used if invoked by use case 3.1. Report User Dengue Case.
Notes and Issues:	

4.2. Track Frequently Visited Locations

Use Case ID:	4.2		
Use Case Name:	Track Frequently Visited Locations		
Created By:	Tang Zhenwei	Last Updated By:	
Date Created:	8/9/2024	Date Last Updated:	

Actor:	User
Description:	User inputs their frequently visited locations
Preconditions:	1. User has started and did not exit from the Track Dengue Case use case flow. 2. User has indicated they have a dengue fever in the Report User Dengue Case use case.
Postconditions:	1. User has input their frequently visited sites, if any.
Priority:	Medium
Frequency of Use:	Once a month ~
Flow of Events:	1. User inputs a list of locations where they have frequently visited since they had the dengue fever. 2. User clicks the Close/Done button to complete the input.
Alternative Flows:	4.2.AF.2. 1. If the user did not enter any locations, prompt the user to choose to re-check their input or exit this use case. 2. If the user chooses to re-check their input, go to normal flow step 1. 4.1.1.AF.2.2. 1. If the user chooses to exit this use case, exit this use case.
Exceptions:	
Includes:	
Special Requirements:	
Assumptions:	This use case is not directly useable by any entity and can only be used if invoked by use case 4. Track Dengue Case.
Notes and Issues:	

4.3. Provide Guidance

Use Case ID:	4.3		
Use Case Name:	Provide Guidance		
Created By:	Tang Zhenwei	Last Updated By:	
Date Created:	8/9/2024	Date Last Updated:	

Actor:	User
Description:	System provides guidance on the actions that the user can take
Preconditions:	1. User has started and did not exit from the Track Dengue Case use case flow. 2. User's dengue case has been recorded in database.
Postconditions:	
Priority:	Low
Frequency of Use:	Twice a month ~
Flow of Events:	1. If the user indicated they have a dengue fever in the Report User Dengue Case use case, system provides the user with actions to assist in getting well, e.g. to use View clinics/hospitals on map use case.
Alternative Flows:	4.3.AF.1. 1. If the user indicated they don't have a dengue fever, system provides the user with actions to protect themselves, e.g. to use Display Tips on Avoid Breeding of Aedes use case.
Exceptions:	
Includes:	
Special Requirements:	
Assumptions:	This use case is not directly useable by any entity and can only be used if invoked by use case 4. Track Dengue Case.
Notes and Issues:	

5. Functional Requirements #5

Use Case ID:	5		
Use Case Name:	Display User Dengue Case		
Created By:	Tang Zhenwei	Last Updated By:	
Date Created:	8/9/2024	Date Last Updated:	

Actor:	User
Description:	Shows whether the user has a dengue fever and relevant details, i.e., symptoms and frequently visited locations, according to the latest user dengue case in database.
Preconditions:	1. User has been successfully authenticated.
Postconditions:	1. User dengue case, symptoms, and frequently visited locations has been retrieved from database.
Priority:	Medium
Frequency of Use:	Four times a week
Flow of Events:	1. System retrieves the latest user dengue case from database. 2. System displays whether the user has a dengue fever. 3. If the user has a dengue fever, display the symptoms and frequently visited locations.
Alternative Flows:	5.AF.3. 1. If the user doesn't have a dengue fever, use the included Display Tips on Avoid Breeding of Aedes use case to instruct the user how to prevent being infected.
Exceptions:	
Includes:	4. Display Tips on Avoid Breeding of Aedes
Special Requirements:	User Authentication
Assumptions:	
Notes and Issues:	

6. Functional Requirements #6

Use Case ID:	6		
Use Case Name:	View Clusters on Map		
Created By:	Choo Wei Boon	Last Updated By:	Choo Wei Boon
Date Created:	9/9/2024	Date Last Updated:	9/9/2024

Actor:	User
Description:	To allow users to visualize and explore the locations of dengue clusters on a map using the Mapbox API.
Preconditions:	1. The system has successfully connected to the Mapbox API and retrieved the necessary map data. 2. The system has access to a dataset of dengue cluster locations.
Postconditions:	1. The user has been presented with a map showing the locations of dengue clusters.
Priority:	High
Frequency of Use:	Frequent
Flow of Events:	1. The system starts, and the user navigates to the "Explore" section. 2. The system initializes the Mapbox map centred on the user's location. 3. The system fetches the dataset of dengue cluster locations. 4. The system iterates through the dengue cluster data and adds markers of the clusters to the Mapbox map. 5. User interaction: The user can interact with the map by: 5.1. Zooming in or out to view different levels of detail. 5.2. Panning the map to explore different areas. 5.3. Clicking on a dengue cluster marker to view more information (e.g. number of cases and addresses).
Alternative Flows:	6.AF.2. 1. If user's location is not provided, center the map on Singapore.
Exceptions:	6.EX.2. 1. If the system encounters errors while communicating with the Mapbox API, it should handle them gracefully, by displaying an error message or retrying the request. 6.EX.3. 1. If the system fails to retrieve dengue cluster data, it should display an appropriate error message.

Includes:	NIL
Special Requirements:	NIL
Assumptions:	Assumes that users will have a reliable internet connection to access the app and retrieve data from the API.
Notes and Issues:	NIL

7. Functional Requirements #7

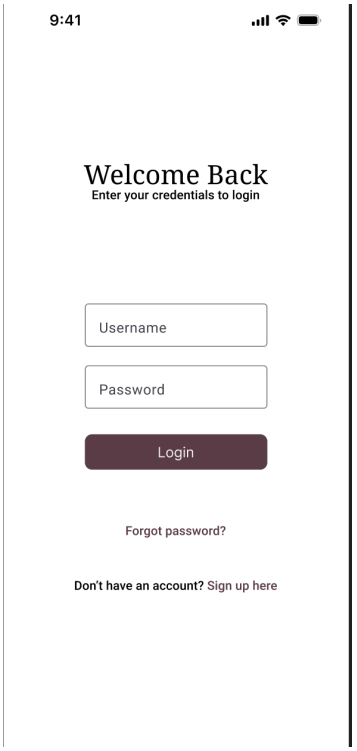
Use Case ID:	7		
Use Case Name:	Show Infection Risk Notification		
Created By:	Choo Wei Boon	Last Updated By:	Choo Wei Boon
Date Created:	9/9/2024	Date Last Updated:	9/9/2024

Actor:	User, System
Description:	To send push notifications to users when they are within 200 meters of a dengue cluster with more than 5 cases.
Preconditions:	1. The user has granted the system permission to access their location. 2. The system has successfully connected to the push notification service. 3. The system has access to a dataset of dengue cluster locations and case counts.
Postconditions:	1. The user has received a push notification alerting them of the potential infection risk.
Priority:	High
Frequency of Use:	Occasionally
Flow of Events:	1. The user grants the system permission to access their location. 2. The system starts tracking the user's location in the background. 3. The system fetches the latest dengue cluster data, including their locations and case counts. 4. The system compares the user's current location with the locations of dengue clusters. 5. If the user is within 200 meters of a dengue cluster with more than 5 cases, the system sends a push notification to the user. 6. The push notification service delivers the notification to the user's device.
Alternative Flows:	NIL
Exceptions:	7.EX.3. 1. If the system fails to retrieve the latest dengue cluster data: 1.1. The system displays an error message indicating that it couldn't retrieve dengue cluster information. 1.2. The system provides options for the user to retry data retrieval or disable notifications temporarily.
Includes:	NIL

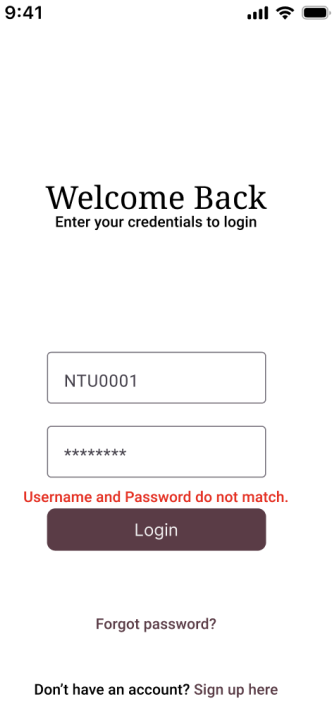
Special Requirements:	NIL
Assumptions:	Assumes that users will have a reliable internet connection to access the app and retrieve data from the API.
Notes and Issues:	NIL

4. UI Mockups

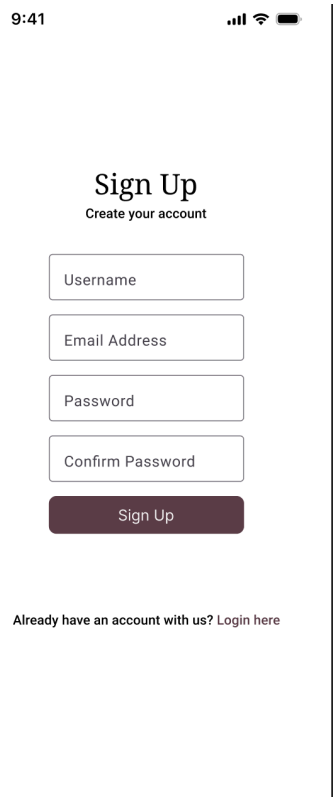
4.1.1. Login Page



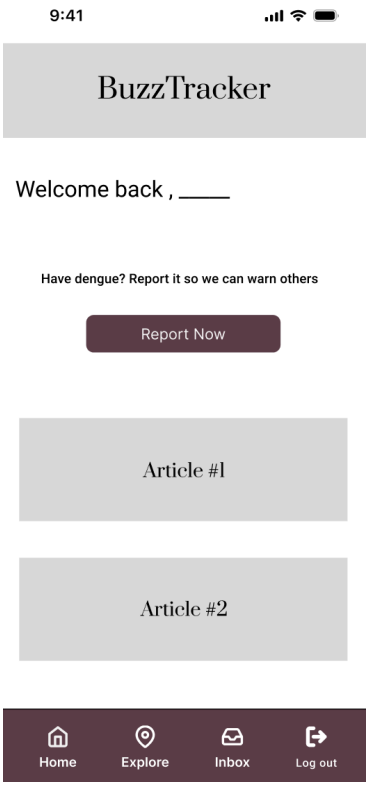
4.1.2. Login Fail



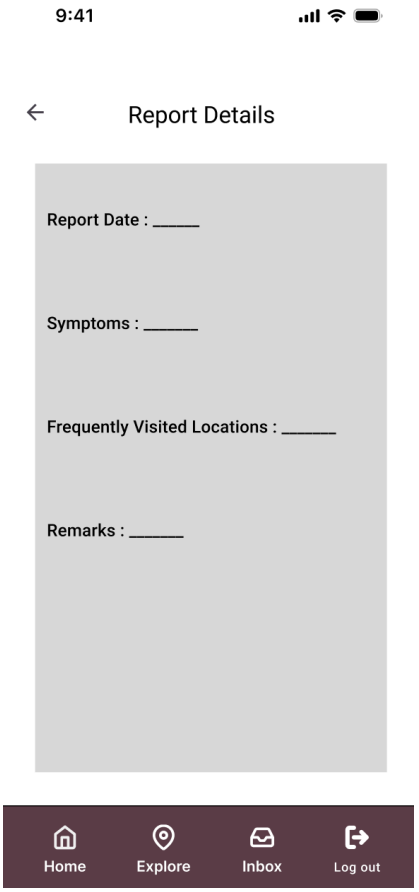
4.2. Sign up


9:41
Sign Up
Create your account
Username
Email Address
Password
Confirm Password
Sign Up
Already have an account with us? Login here

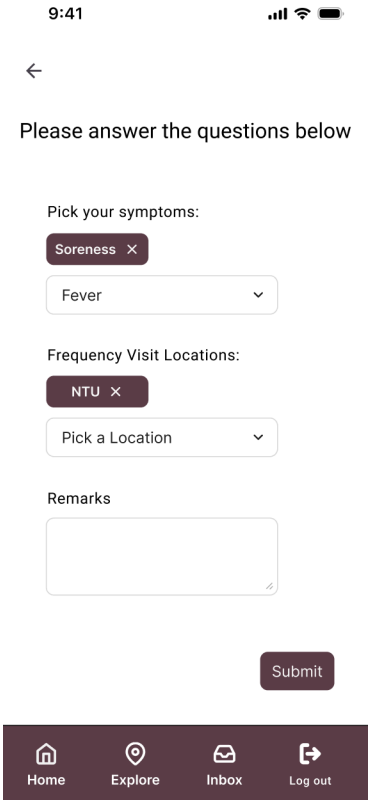
4.3. Home Page

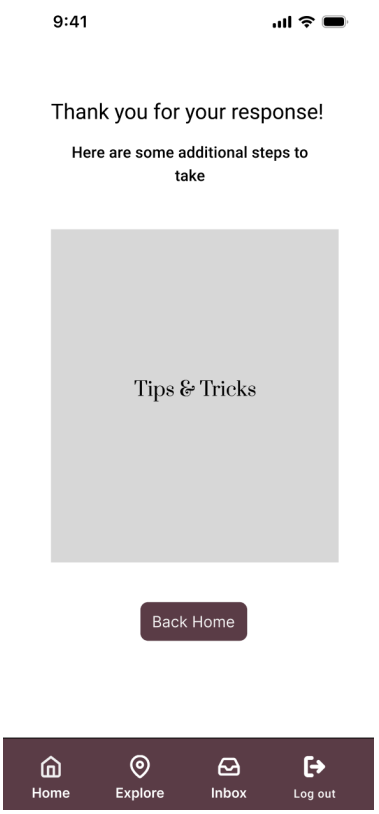

9:41
BuzzTracker
Welcome back , _____
Have dengue? Report it so we can warn others
Report Now
Article #1
Article #2
Home
Explore
Inbox
Log out

4.3.1. View Report Dengue Status + Details

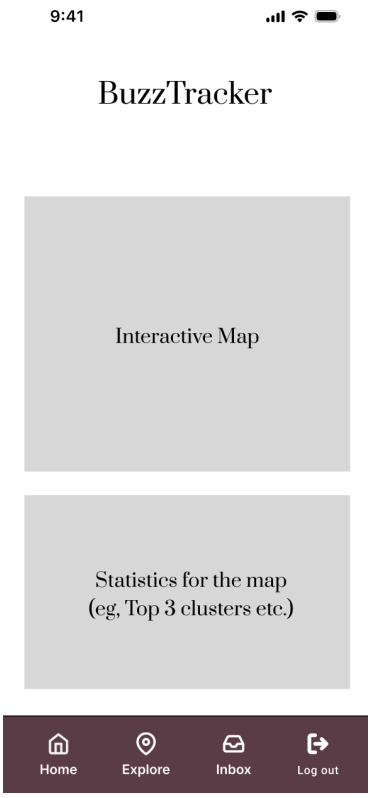


4.3.2. Report Dengue Status + Thank you for response & Guidance





4.4. Explore Page



4.5. Inbox


9:41
Many cases detected in your area
Read the latest news ....
Home
Explore
Inbox
Log out