Use Case ID:	#1		
Use Case Name:	Auto detect current location		
Created By:	Perlyn	Last Updated By:	Perlyn
Date Created:	1 September 2020	Date Last Updated:	8 September 2020

Actor:	User, Google Maps API
Description:	Use case is to detect the user's current location.
Preconditions:	User's location services must be enabled.
Postconditions:	The coordinates of the user's location must be generated.
Priority:	Highest
Frequency of Use:	Very frequent
Flow of Events:	1. The system requests to detect the location of user. 2. User should allow auto-location on his device. 3. The system uses the built in GPS system to locate the user. 4. The system calls the Google Maps API to pass in the current location of user. 5. On successful location, the system automatically generates the nearest recycling bins to the user.
Exceptions:	The user’s Wi-Fi is turned off. The system requests the user to obtain internet connection via a pop-up.
Includes:	-
Special Requirements:	User's location services must be enabled
Assumptions:	User has access to internet connection, device has built in GPS
Notes and Issues:	NA

Alternative Flows for use case #1

AF-S3: The system is unable to automatically locate the user's location

1. The system allows the User to either try auto-detection again or input his/her location manually.
2. Upon getting the user's location, the system passes the location to the Google Maps API
3. The system returns to step 5

Use Case ID:	#2		
Use Case Name:	Manually receive user's input on his location.		
Created By:	Justin	Last Updated By:	Justin
Date Created:	8 September 2020	Date Last Updated:	8 September 2020

Actor:	User, Google Maps API
Description:	Use Case is to accept the user's manually inputted location and use it to search for the nearest 10 Recycling Bins.
Preconditions:	User must opt to manually input his/her location in the Application, when searching for Recycling Bins.
Postconditions:	The System uses the manually inputted location to generate its coordinates, then to search for the nearest 10 Recycling Bins.
Priority:	High
Frequency of Use:	Frequent
Flow of Events:	1. The System attempts to auto-detect the User Location. 2. The System fails to do so and allows the User to either try auto-detection again or input his/her location manually. 3. The user opts to manually input the location, and a pop up appears allowing him to key in the postal code/location name for detection. 4. The user keys in his location and it is recognized by the System through the Google Maps API. 5. The Google Maps API helps to return the location's coordinates to the System. 6. The System uses the returned coordinates to locate the nearest 10 Recycling Bins.
Exceptions:	The user keys in an invalid address/postal code. 1. The System displays the message "This location is invalid, please try again" for 2 seconds. 2. The message reverts to "Please key in your location" where the user can retry inputting his location or cancel.
Special Requirements:	The user's inputted location must be detectable by the Google Maps API.
Assumptions:	The user has an active Data Connection.
Notes and Issues:	The user can always opt to retry auto-detection of his/her location instead of manually keying in his location or address.

Use Case ID:	#3		
Use Case Name:	Return nearest Recycling Bins.		
Created By:	Justin	Last Updated By:	Justin
Date Created:	8 September 2020	Date Last Updated:	8 September 2020

Actor:	User, Data.gov API
Description:	User case is to return the nearest Recycling Bins based on the user's location
Preconditions:	The user's location must be detected by the System.
Postconditions:	The coordinates of the Recycling Bins must be passed back as data into the System.
Priority:	Highest
Frequency of Use:	Very frequent
Flow of Events:	1. The System detects the user's location (user has allowed location services). 2. The System uses the user's location coordinates to calculate the closest bins. 3. The System returns the nearest 10 Recycling Bins (coordinates).
Exceptions:	The system is unable to locate the user's location. 1. The System displays the message "We are unable to detect your location." 2. A pop-up consisting of 3 buttons with the messages "Try Again", "Manually Input Location" and "Cancel" respectively shows up on the user's screen, prompting him to choose one option. 3. The user decides to either try auto-detection, manually input his/her location or cancel the search operation altogether.
Includes:	The Google Maps API drops pins on the Application Map, corresponding to the returned coordinates.
Assumptions:	The user has enabled his location services and has an active data connection.

Use Case ID:	#4		
Use Case Name:	Drop pins on nearest recycling bins.		
Created By:	Song Yun	Last Updated By:	Song Yun
Date Created:	8 Sept 2020	Date Last Updated:	

Actor:	Google Map API
Description:	Pins will be used to indicate the coordinates of the nearest recycling bins.
Preconditions:	Coordinates of the nearest recycling bins.
Postconditions:	Pins are displayed on the user interface .
Priority:	Highest
Frequency of Use:	Very frequent
Flow of Events:	1. The system receives the coordinates of the nearest recycling bins. 2. Google Map APIs must drop the pins at the respective coordinates on the user interface.
Exceptions:	The system returns the wrong coordinates of the drop pins.
Includes:	-
Special Requirements:	-
Assumptions:	The user has stable internet connection.
Notes and Issues:	-

Use Case ID:	#5		
Use Case Name:	Provide a warning on the type of items recyclable		
Created By:	Song Yun	Last Updated By:	Song Yun
Date Created:	8 September 2020	Date Last Updated:	8 September 2020

Actor:	User
Description:	The System will provide a list of recyclable and non-recyclable items to the user.
Preconditions:	The user's device must have an active internet connection.
Postconditions:	The System must output suggestions on the type of items that are recyclable.
Priority:	Highest
Frequency of Use:	Very frequent
Flow of Events:	1. The user clicks on 'What are Recyclables' button. 2. The System gives a warning on the type of items recyclable. 3. The System gives a button to allow user to scan items.
Exceptions:	-
Includes:	-
Special Requirements:	The System must update the list of recyclable items from NEA's list.
Assumptions:	-
Notes and Issues:	-

Use Case ID:	#6		
Use Case Name:	Scan item to determine if it is recyclable.		
Created By:	XinRui	Last Updated By:	XinRui
Date Created:	8 September 2020	Date Last Updated:	8 September 2020

Actor:	User, Machine learning model within mobile app.
Description:	User will place the potential recyclable within camera view, and the Machine Learning model within the mobile app will determine whether the item is recyclable.
Preconditions:	The user must accept system’s permission to use device’s camera.
Postconditions:	The system returns the item type and determines if it is recyclable.
Priority:	High
Frequency of Use:	Frequent (When the user wishes to clarify whether the item is recyclable.
Flow of Events:	1. The user clicks on "verify recyclable" button. 2. The system requests for user’s permission to access device camera. 3. The system scans the item and calls the Flutter photo recognition system. 4. The system gets the item type from the photo recognition system and returns it to the user and alerts user if item is recyclable.
Exceptions:	1. The user declines permissions to use his/her camera. 2. The Machine Learning model is unable to give a high confidence prediction.
Assumptions:	The item presented is similar to our Machine Learning model's training images.