INFORMATION TECHNOLOGY
UNIVERSITY OF THE PUNJAB

Software Engineering (CE304T)

CEP: Assignment # 03

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Dated: May 12, 2024

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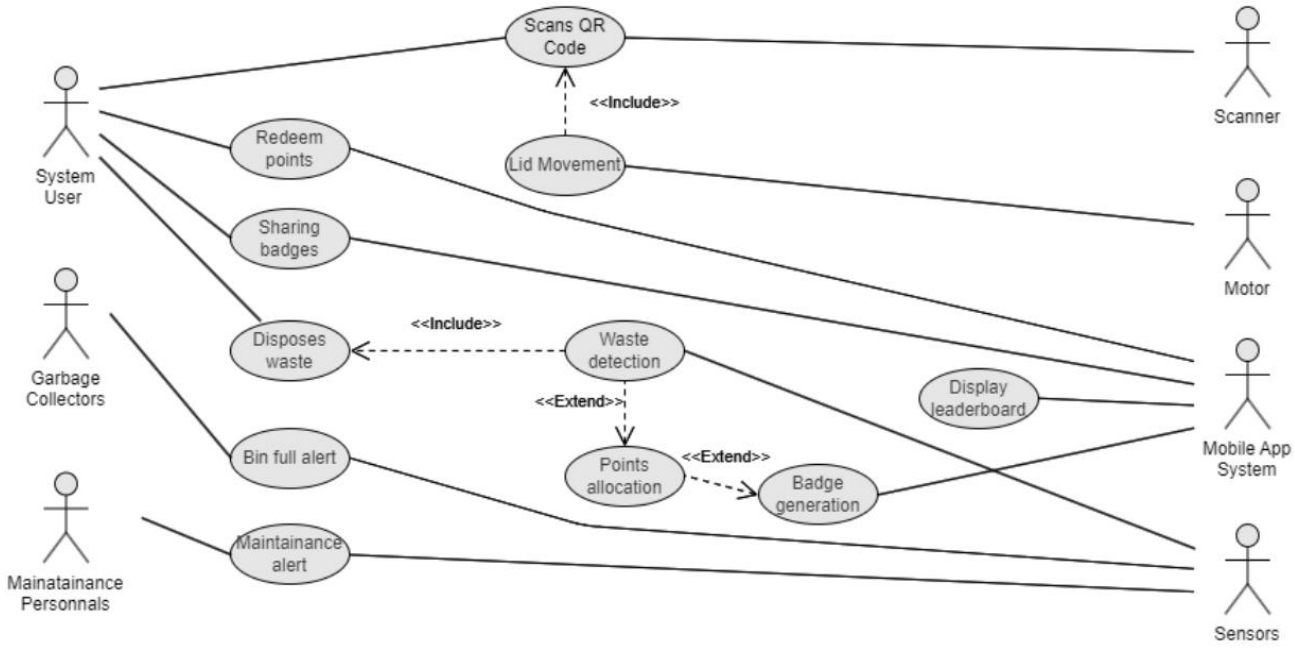
1. Use Case Diagram (Recalling)

In this assignment, we are required to make structural and dynamic models of our system that will cover all the use cases of our system TRASHCA$H.

Recalling the use case diagram:



2. Structural Model

The structural model of the system will be a detailed UML class diagram showing all the relationships between the classes.

2.1. Relationships

2.1.1. Association

- User and Mobile App (association relation; there are many users, and each user has its own app)
- App and scanner (directed association; The mobile app interacts with the Scanner class by scanning QR codes)

2.1.2. Dependency

- User uses the mobile app (dependency relation; because the user needs a mobile app to access its functionalities)
- Motor uses sensor class (dependency; sensor detects the type of trash, then lid moves accordingly)

2.1.3. Extends/Includes

- Sensors include motor class.

- When trash is detected, it extends to points allocation. (sensor to point allocation class)

2.1.4. Composition

- Badge class composes the points allocation class (if points allocation class does not exist, then badge class will also not exist)

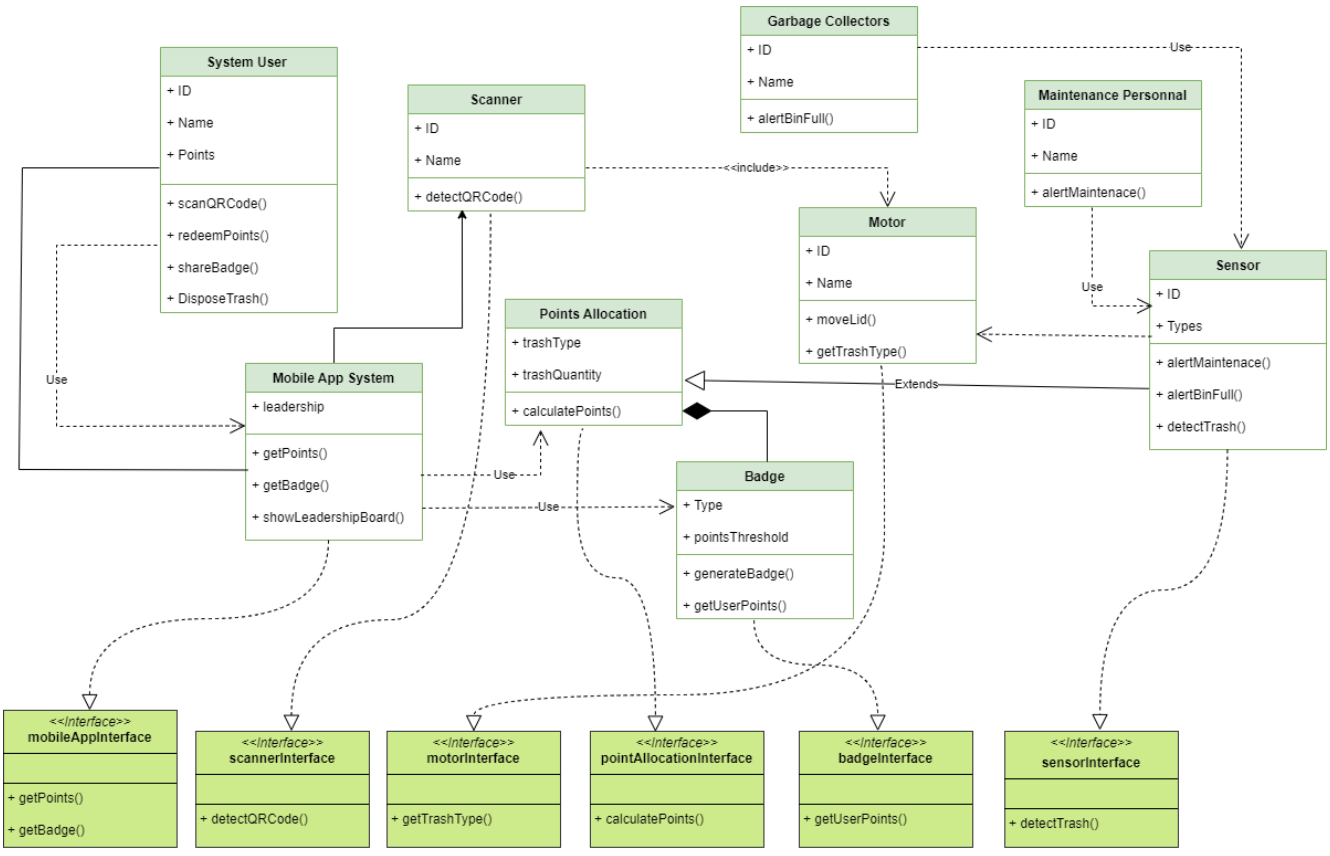
2.1.5. Uses/Use by

- Mobile app uses points allocation class (it gets points details for its leaderboard from point allocation class)
- Mobile app uses badge class (it gets the badge for its leaderboard from badge class)
- Maintenance personnel use sensor class. (Maintenance personnel is dependent on sensor class to get alerts.
- Garbage Collector uses sensor class. (Maintenance personnel is dependent on sensor class to get alerts.

2.1.6. Interfaces

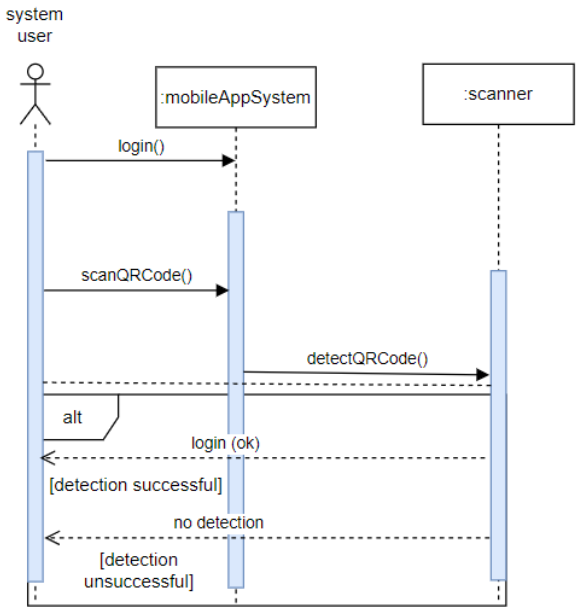
- Mobile app system, scanner, motor, point allocation, badge, and sensor class will also have their interface classes.

2.2. UML Class Diagram

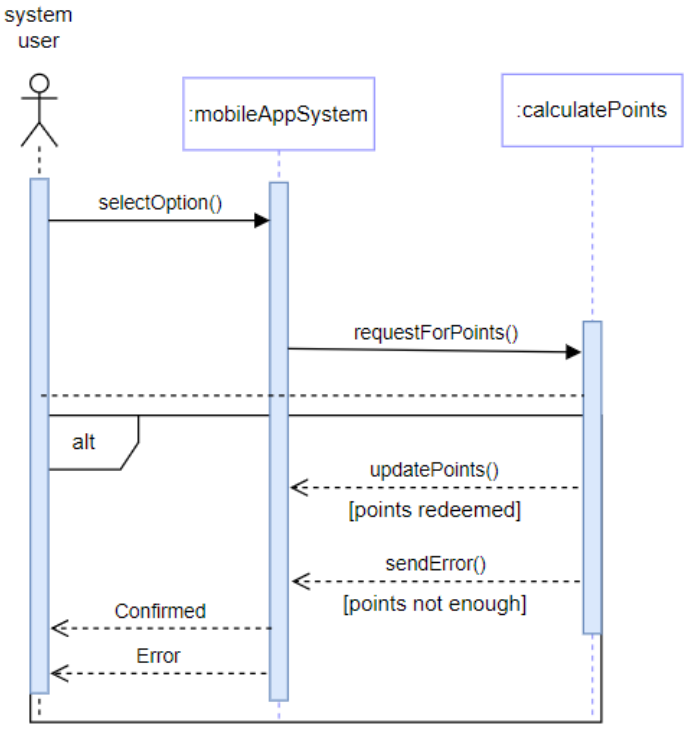


3. Dynamic Model

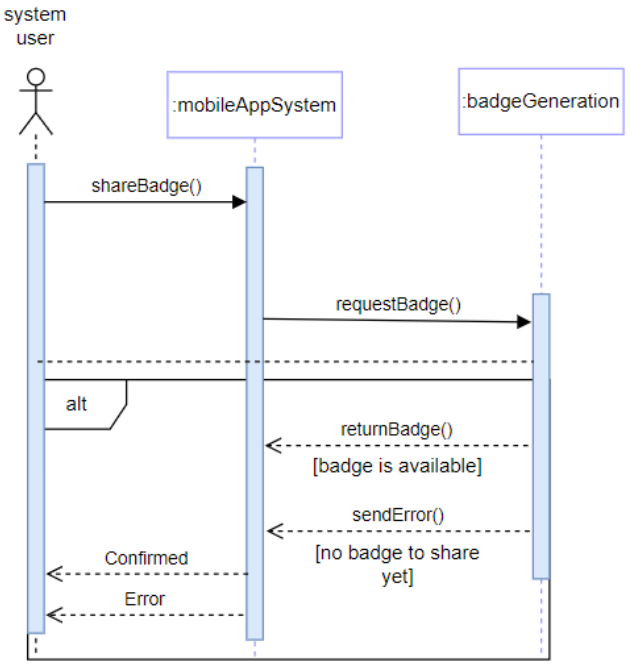
3.1. Use Case # 01: User Scans QR Code



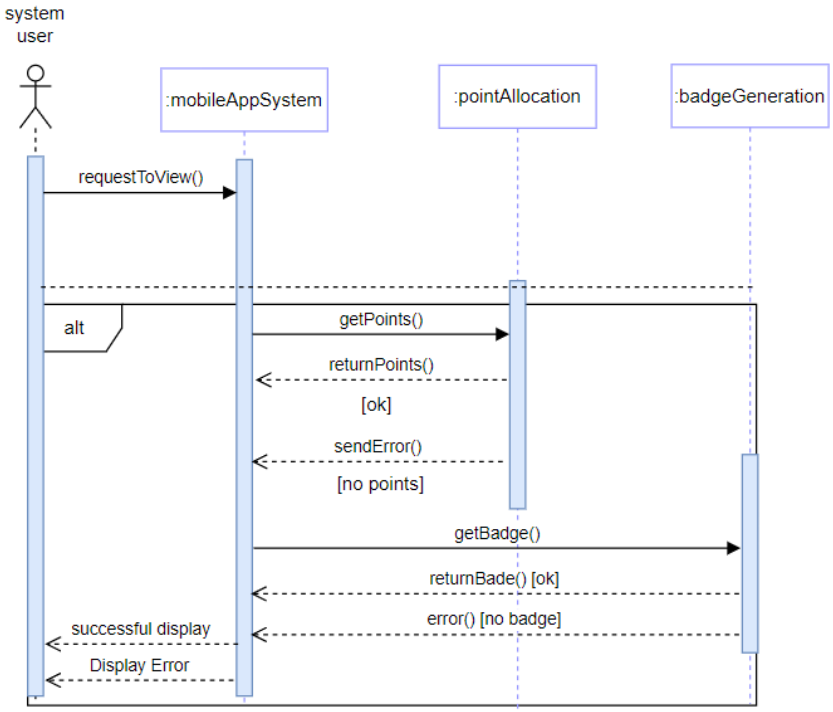
3.2. Use Case # 02: User Redeems Points



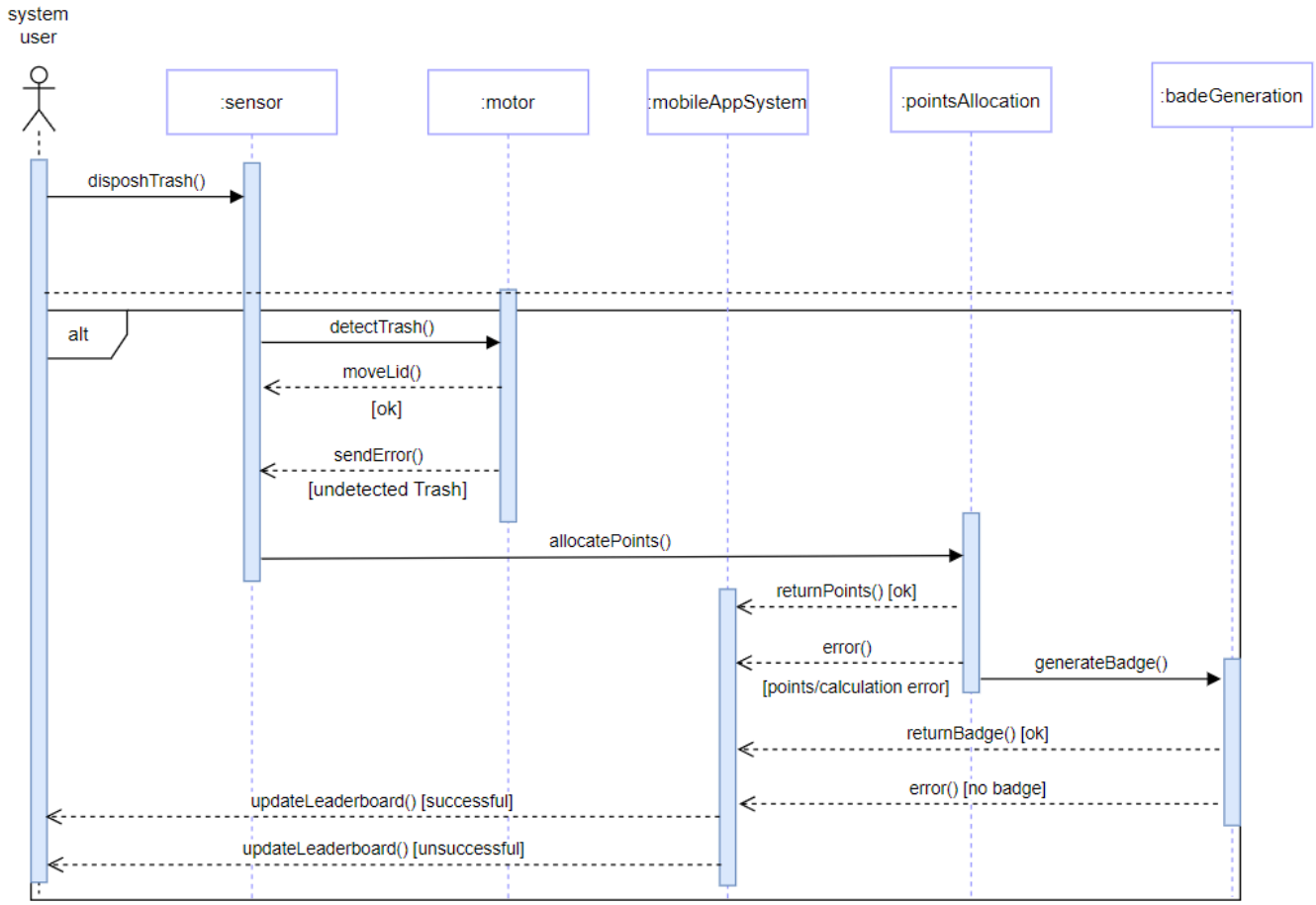
3.3. Use Case # 03: User Shares Badges



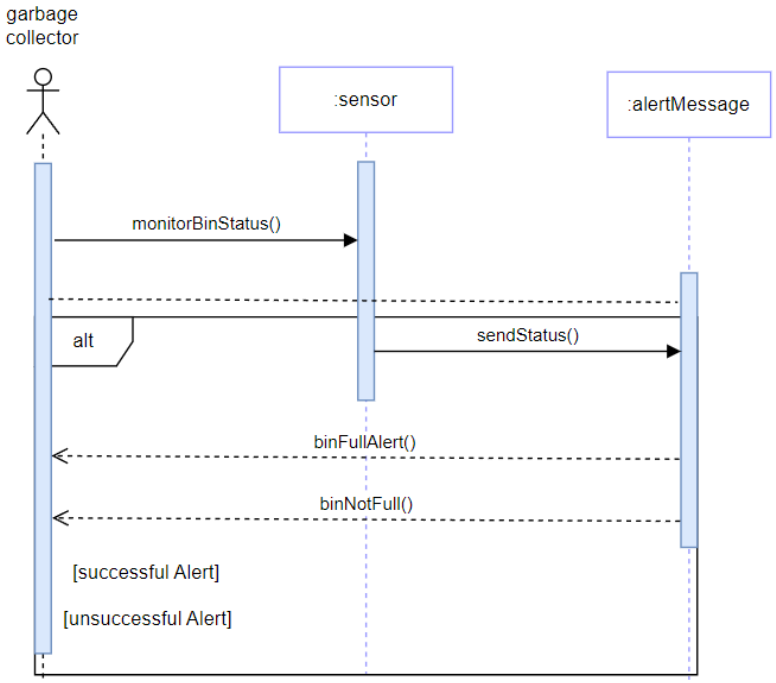
3.4. Use Case # 04: Display Leaderboard on App



3.5. Use Case # 05: Dispose Trash



3.6. Use Case # 06: Bin Full Alert to Garbage Collector



3.7. Use Case # 07: Maintenance Alert to Maintenance Personnel