PDF Document Outline: Smart Dustbin Management Backend Services

1. **Introduction**
    - Brief overview of the Smart Dustbin Management system and its purpose.
    - High-level architecture (if applicable - e.g., microservices, monolithic).
    - Purpose of this document: to detail the backend services.
2. **Core Services**
    - **Bin Data Management Service**
        - Description: Handles the collection, storage, and retrieval of data from smart bins.
        - Functions:
            - Data ingestion from MQTT (or other sources).
            - Data validation and transformation.
            - Storage in the database.
            - API endpoints for retrieving bin data (e.g., current fill level, history).
        - Relevant Code: `bin.py`, `generate_bin_data.py`
    - **Suburb Data Management Service**
        - Description: Manages data related to the suburb, including houses, streets, and locations.
        - Functions:
            - Storage and retrieval of suburb-related entities.
            - Relationships between entities (e.g., house belongs to street).
            - Potentially, geospatial queries.
        - Relevant Code: `location.py`, `driveway.py`, `house.py`, `street.py`, `suburb.py`, `generate_suburb_data.py`
    - **MQTT Communication Service**
        - Description: Handles communication with the MQTT broker for both publishing and subscribing to data.
        - Functions:
            - Publishing data to specific topics.
            - Subscribing to topics to receive updates.
            - Message formatting and handling.
        - Relevant Code: `publish_suburb_data.py`, `subscriber.py` (and potentially `publisher.py` if you have a separate general publisher)
    - **PDF List Generation Service**
        - Description: Generates PDF documents for reporting and data export.
        - Functions:
            - Retrieving data from the database.
            - Formatting data into a readable PDF format.
            - Generating reports on demand.
        - Relevant Code: (This would be a new service/module we'd define, but it's outlined in the previous PDF)
3. **Data Models**
    - Briefly describe the main data models and their attributes. (This could reference the `Suburb Model Python Classes Documentation.pdf` if you want to include that as an appendix or separate document).
    - Examples:

        - Bin: `bin_id`, `location`, `fill_level`, `status`, `timestamp`
        - House: `address`, `location`, `property_id`
        - Street: `street_name`, `suburb_name`
4. **APIs (if defined)**
    - If you've started defining any API endpoints (e.g., REST API for accessing data), list them here with their methods (GET, POST, etc.) and purpose.
5. **Technologies Used**
    - Python
    - paho-mqtt
    - (Any database you're using - e.g., PostgreSQL, MongoDB)
    - (Any web framework - e.g., Flask, Django)
    - (PDF generation library - e.g., ReportLab)
6. **Future Services**
    - Mention any services you plan to add in the future (e.g., user authentication, data analytics, mapping/visualization).