Maintenance Guide – Smart Parking Management System

Purpose: Ensure future maintainers can install, update, and improve the system after project delivery.

# 1. System Architecture

- Frontend: Flutter mobile app (in /flutter\_application\_1/)  
- Backend: Flask server (app.py)  
- Database: PostgreSQL (database.py)  
- Deployment: Localhost or hosted on cloud/VPS

# 2. Prerequisites

- Python 3.8+  
- Flutter SDK (2.10 or later)  
- PostgreSQL  
- Git, pip, pub (Flutter package manager)

# 3. Installation Instructions

Backend Setup:

1. 1. Clone the repository:  
    git clone https://github.com/shadymansour9/final\_project.git  
    cd final\_project
2. 2. Install Python packages:  
    pip install -r requirements.txt
3. 3. Configure PostgreSQL connection:  
    - Update the connection string in database.py
4. 4. Start the Flask server:  
    python app.py  
    - Default runs at: http://127.0.0.1:5000

Frontend (Flutter App) Setup:

1. 1. Navigate to frontend directory:  
    cd flutter\_application\_1
2. 2. Get dependencies:  
    flutter pub get
3. 3. Run the app:  
    flutter run

# 4. Maintenance Tasks

- Add New Features: Update frontend in Flutter files or backend API routes in app.py  
- Adjust User Classification Logic: Modify the simulation or ML logic in the appropriate route  
- Export/Backup Database:  
 pg\_dump -U your\_user -d parking\_db > backup.sql  
- Update Scoring Parameters: Update default values in the simulation screen or backend route