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1. APP summary and document's structure map

Real-time parking availability system for SUU Electronic Learning Center, monitoring Lots 14, 17, 18, and 19. This application provides users with live parking information based on their permit type (Student, Staff, or Visitor).

System files:

- Client Application (parking_app_UPDATED.py) - Desktop GUI for users
- Server Application (parking_server.py) - Flask-based REST API
- Admin Web Interface (admin.html) - Browser-based parking management
- Data Storage (parking_data.json) - Persistent parking state

```
└── templates/admin.html
└── docs/Stage2_Implementation_Report.docx
└── docs/test_results.txt
└── docs/Manual_Testing.mp4
└── parking_app_UPDATED.py  (all classes)
└── parking_server.py  (Flask server)
└── parking_data.json
└── test_parking_app.py  (15 tests)
└── README.docx
```

2. Installation environment request and install steps

2.1 Installation environment:

- Python 3.7 or higher
- Web browser (Chrome, Firefox, Edge, or Safari)
- Required Python packages: Flask, Flask-CORS, Tkinter

2.2 Install steps:

Unzip the project folder to your desired location

Start the Server First: parking_server.py

Open Admin Interface: <http://localhost:5000>

⚠️ IMPORTANT:

- DO NOT open admin.html directly from file explorer!

Run the Client Application: python parking_app_UPDATED.py

3. Functions

3.1 Admin panel <http://localhost:5000>

- Features:
 - Click individual space numbers to toggle occupied/unoccupied
 - Click CLEAR ALL/ RANDOMIZE/ FILL ALL buttons to toggle block occupied/unoccupied

3.2 Server and client app communication

Open both admin panel and client-side app to see their communication:

Click the occupation in admin panel then see the update of the parking lots information in the client-side app

3.3 User app experience

In client app, switch the Student, Staff and Visitor button to see the parking lots No. changes.

Click the "Refresh" button to see the manual refresh update the parking lots information

3.4 Video provided to show functions

Filename: Manual_Testing.mp4

Location: docs/Manual_Testing.mp4