# License Plate Recognition System User Guide

## 1. Overview

The License Plate Recognition System is a Python-based application that utilizes the Plate Recognizer API to detect and recognize license plates from images. The system can:

* Process single or multiple images
* Extract license plate numbers, vehicle make, and model information
* Save results in both Excel and JSON formats
* Handle retries for failed recognition attempts
* Process random subsets of images for testing

## 2. Installation & Setup

### Prerequisites

Python Version: Python 3.x

Required Python packages:

* requests
* opencv-python (cv2)
* pandas
* IPython (optional, for notebook support)

### Directory Structure

Project Root:

* Selected\_images/ - Directory for input images
* output/ - Directory for processed results
* test\_results/ - Directory for test outputs
* evaluation/ - Directory for evaluation results
* PlateRecognizer.py - Main Python script
* PlateRecognizer.ipynb - Jupyter notebook version

## Setup Steps

1. Install Python 3.x from python.org
2. Install required packages using pip: pip install -r requirements.txt
3. Create the following directories in your project root:

* selected\_images/ (for input images)
* output/
* test\_results/
* evaluation/

1. Place your license plate images in the selected\_images/ directory
2. Ensure you have a valid PlateRecognizer API token (You would require a paid subscription as the normal subscription only provides license plate and not make and model)

## 3. Running the System

### Running the Python Script

1. Open a terminal/command prompt
2. Navigate to your project directory
3. Run the script: python PlateRecognizer.py

## 4. Available Functions

1. **Process All Images**

* Processes all images in the selected\_images/ directory
* Excel & JSON results are saved in the All\_results/ directory, if not specified
* Usage: process\_all\_images()

1. **Process Random Images**

* Processes a specified number of random images (through num\_images)
* Results are saved in the Subset\_results/ directory
* Usage: process\_random\_images()

1. **Process Single Image**

* Processes a single image with retry mechanism
* Usage: process\_single\_image()

1. **Test Single Image**

* Tests license plate recognition on a single image
* Results are saved in the test\_results/ directory
* Usage: test\_single\_image()

## Possible Errors & Troubleshooting

## Common Issues and Solutions

## API Connection Errors

* Error: "Error: [status\_code] [error message]"
* Solution:
  + Check your internet connection
  + Verify the API token is valid
  + Ensure the API endpoint is accessible

## Image Processing Errors

* Error: "No plate detected"
* Solution:
  + Ensure images are clear and well-lit
  + Check if the license plate is visible and not obstructed
  + Verify image format (supports .jpg, .jpeg, .png)

1. **File System Errors**

* Error: "Directory not found" or "File not found"
* Solution:
  + Verify all required directories exist
  + Check file permissions
  + Ensure correct file paths are used

1. **Memory Errors**

* Error: "Directory not found" or "File not found"
* Solution:
  + Verify all required directories exist
  + Check file permissions
  + Ensure correct file paths are used

## Best Practices

* Keep images in the supported formats (.jpg, .jpeg, .png)
* Ensure images are of good quality and well-lit
* Process images in batches if dealing with large numbers
* Regularly backup your results
* Monitor API usage to avoid rate limits

## Support

This guide provides a comprehensive overview of the License Plate Recognition System. For additional support or specific issues, please contact the development team or refer to the Plate Recognizer API documentation.