PROJECT 5: LICENSE PLATE DETECTION

Group 5

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Project 5: Senegalese License Plate Detection

Vehicle License Plate Recognition System

Problem Statement

Develop a pure Python program that detects Senegalese license plates in any text string using specified format patterns.

Plate Formats

- XY-abcd-T or XY abcd T
- XY-abcd-ZT or XY abcd ZT

Where: X, Y, Z, T $\rightarrow$ Letters (A–Z) a, b, c, d $\rightarrow$ Digits (0–9)

Rules

Additional Rules

- Matching is **case-insensitive**
- Plates must be **normalized to uppercase** and written in canonical form: `XY-ABCD-T` or `XY-ABCD-ZT`
- Allow either `-` or a single space as separator (e.g. `XY 1234 T` or `xy-1234-zt`)
- Do **not match substrings** embedded in longer alphanumeric tokens

Logic and Approach

- The program reads any text input and scans it **character by character**.
- When a letter is found, it considers **the letter + the next 9 characters** as a possible plate candidate.
- The `is_plate()` function verifies whether this candidate matches the structure of a Senegalese plate.
- If valid, the plate is then normalized to ensure the correct use of dashes (-) instead of spaces.
- The detection ensures that the plate is separated from other words by space or punctuation.

Function Breakdown

1. **is_plate(candidate)**
   - Validates the structure of the plate:
     Recognize: XY-abcd-T, XY-abcd-TZ, XY abcd T, XY-abcd-TZ as valid plates.
   - Checks for correct placement of letters, digits, and separators.
   - Returns a tuple `(True, uppercase plate)` if valid, or `False` otherwise.
2. **normalize(plate)**
   - Converts all spaces in valid plate to dashes for consistency.
   - Returns a normalized plate string.

Function Breakdown

3. detection(text)

- Scans text to find valid plates.
- Ensures that detected plates are not part of another word: e.g.: This plateXY-1234-ZT is not valid
- Returns a list of normalized plates found in the text.

4. main()

- Provides an interactive console interface.
- Allows users to input text repeatedly.
- Displays detected plate numbers in uppercase.
- Ends when the user types q.

Example

Example Output

```
 Welcome, enter text to test (or 'q' to quit):
Yesterday I saw DK 4321 T and ZG-1234-ZT.
The text contains 2 Senegalese plate numbers:
['DK-4321-T', 'ZG-1234-ZT']
```

Summary

- The project was implemented in pure Python without external libraries.
- The program is strict, efficient, and case-insensitive.
- All detected plates are normalized and clearly formatted.

End of Presentation