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(ESTD-1995)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

CRIME PREDICTION USING A MACHINE LEARNING ALGORITHM

TESTING:

1. Data Loading and Preprocessing

- **Test Case 1:** Verify that 'crime_data.csv' is loaded successfully without errors.

- **Test Case 2:** Confirm that the dataset contains the required columns ('Year', 'City', 'Type').

- **Test Case 3:** Ensure that missing values are handled properly (e.g., dropna() works).

2. Model Training and Saving

- **Test Case 4:** Check that each model in the models dictionary trains successfully without errors.

- **Test Case 5:** Verify that labeled encoders (le_location, le_target) are fitted correctly.

- **Test Case 6:** Confirm that models are saved (joblib.dump) and can be loaded later.

3. Prediction Functionality

- **Test Case 7:** Send a POST request to /predict with valid 'date' (YYYY-MM-DD format) and 'location' and verify a prediction is returned.

- **Test Case 8:** Send the same request with an invalid date format and check for proper error handling.

- **Test Case 9:** Send a request with a non-existent location and verify error handling.

4. Web Page Rendering

- **Test Case 10:** Access the homepage (/) and check that all locations are listed correctly.

- **Test Case 11:** After prediction, check that the result.html displays predictions and the filtered table.

5. Error and Edge Cases

- **Test Case 12:** Simulate missing or corrupt model files and verify that the application handles errors gracefully.

- **Test Case 13:** Provide a date outside the dataset range and verify how the system responds.

- **Test Case 14:** Submit empty input or missing form data and check for appropriate error messages.