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DAY - 6

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SWIPE >>>

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Challenge: Data Vault Breach Lists & Tuples Unlock Protocol

You're a data analyst at XCellence Analytics, and your team is building an internal AI tool to process encrypted logs stored in legacy formats. These logs use Lists and Tuples as their core structures. A breach simulation was initiated to test the tool's resilience — and you've been chosen to solve the challenges first.

Your task? Decode, manipulate, and optimize the data structures to pass the security audit. Ready?

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Unstructured Access Logs – List Operations

You receive a list of mixed-format access logs:
logs = ['LOGIN', 202, 17.3, 'ERROR', True, [401, 'RETRY'], 'LOGIN', 202]

Tasks:

1. Sub-Log Analysis

Extract the string 'RETRY' from the nested structure using proper indexing.

2. Log Correction

Replace the string 'ERROR' with 'RECOVERED'.

3. Duplicate Sweep

Remove the first occurrence of the status code 202 using list operations.

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4. Timestamp Injection

Insert the integer 2025 at index 2 to simulate a new timestamp.

5. Frequency Check

Count how many times 'LOGIN' appears in the logs.

6. Merge Patch Files

You have a new patch log:
patch_logs = ['REBOOT', 'AUTH']
First: Use .append() to add patch_logs to logs and observe the structure.
Then: Reset logs, and use .extend() instead. Note the difference.

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Immutable Archives – Tuple Operations

Archived error messages are stored in a secure, immutable format
error_tuple = ('CRITICAL', 500, 19.5, False, 'CRITICAL', 500)

Tasks:

1. Error Indexing
Retrieve the index of the first 'CRITICAL' tag.

2. Incident Counting
Count how many times 500 appears in the tuple.

3. Merge Archive Records
Combine with a second tuple:
additional = ('RETRY', 304)
into a new tuple merged.

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4. Tamper Attempt

Attempt to overwrite index 2 with 'MODIFIED' using a try-except block. Capture and print the exception.

5. Deletion Simulation

Delete the tuple error_tuple and try accessing it afterward. (Explain why an error is expected.)

Mutable Elements Inside Tuples

Your security audit team flags this structure:
audit_log = ([10, 20, 30], 'FIREWALL', (1, 2))
Can you modify audit_log[0][1] = 99?
What does this behavior reveal about mutability inside an otherwise immutable structure?

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Now It's Your Turn!

Drop your answers
in the comments!