Capstone Project
SQL MURDER MYSTERY

SQL Detective: AMIT PANDEY

#SQLWithIDC

Objective

- A mysterious incident has struck TechNova Inc., leaving behind scattered logs, conflicting alibis, and unanswered questions.
  As the lead data analyst, my mission is to dive into the datasets, connect every clue using SQL, and uncover who was responsible, when and where it occurred, and how the entire event unfolded.

Investigation step- 1: Identify where and when the crime happened

```
SELECT
    room AS crime_location,
    entry_time AS crime_time
FROM
    keycard_logs
WHERE
    room = 'CEO Office'
ORDER BY
    entry_time desc;
```

- Output

	crime_location	crime_time
1	CEO Office	2025-10-15 20:50:00.000

Investigation step- 2: Analyze who accessed critical areas at the time

```
SELECT
      e.employee_id,
      e.name,
      k.room,
      k.entry_time,
      k.exit_time
FROM
      employees AS e
JOIN
       keycard_logs AS k ON e.employee_id =
k.employee_id
WHERE
       room = 'CEO Office’
       AND entry_time BETWEEN '2025-10-15 20:00:00’
AND '2025-10-15 21:00:00';
```

- Output

Results | Messages

	employee_id	name	room	entry_time	exit_time
1	4	David Kumar	CEO Office	2025-10-15 20:50:00.000	2025-10-15 21:00:00.000

Investigation step- 3: Cross-check alibis with actual logs

```sql
SELECT
    e.employee_id,
    e.name,
    a.claimed_location,
    k.room AS actual_room,
    a.claim_time,
    k.entry_time,
    k.exit_time,
    CASE
        WHEN k.room IS NULL THEN 'no log available for claim_time'
        WHEN k.room = a.claimed_location THEN 'Match'
        ELSE 'Mismatch'
    END AS status
FROM employees e
JOIN alibis a ON e.employee_id = a.employee_id
LEFT JOIN keycard_logs k ON e.employee_id = k.employee_id
AND a.claim_time BETWEEN k.entry_time AND k.exit_time
ORDER BY employee_id;
```

- Output

Results | Messages

	employee_id	name	claimed_location	actual_room	claim_time	entry_time	exit_time	status
1	1	Alice Johnson	Office	NULL	2025-10-15 20:50:00.000	NULL	NULL	no log available for claim_time
2	4	David Kumar	Server Room	CEO Office	2025-10-15 20:50:00.000	2025-10-15 20:50:00.000	2025-10-15 21:00:00.000	Mismatch
3	5	Eva Brown	Marketing Office	NULL	2025-10-15 20:50:00.000	NULL	NULL	no log available for claim_time
4	6	Frank Li	Office	NULL	2025-10-15 20:50:00.000	NULL	NULL	no log available for claim_time

Investigation step- 4:
Investigate suspicious calls made around the time

```sql
SELECT
    c.call_id,
    e1.name AS caller_name,
    e2.name AS receiver_name,
    c.call_time,
    c.duration_sec
FROM
    calls AS c
JOIN
    employees AS e1
    ON c.caller_id = e1.employee_id
JOIN
    employees AS e2
    ON c.receiver_id = e2.employee_id
WHERE
    call_time BETWEEN '2025-10-15 20:00:00' AND '2025-10-15 21:00:00';
```

- Output

Results | Messages

	call_id	caller_name	receiver_name	call_time	duration_sec
1	1	David Kumar	Alice Johnson	2025-10-15 20:55:00.000	45
2	5	David Kumar	Grace Tan	2025-10-15 20:40:00.000	90

Investigation step- 5: Match evidence with movements and claims

```sql
SELECT
    ev.evidence_id,
    ev.room AS evidence_room,
    ev.description,
    CAST(ev.found_time AS TIME) AS found_time,
    e.name,
    k.room AS actual_location,
    CAST(k.entry_time AS TIME) AS entry_time,
    a.claimed_location,
    CAST(a.claim_time AS TIME) AS claim_time,
    CASE
        WHEN a.claimed_location IS NULL THEN 'alibi not available'
        WHEN a.claimed_location = k.room THEN 'Alibi match'
        ELSE 'Alibi Mismatch'
    END AS Alibi_Status
FROM
    evidence ev
JOIN
    keycard_logs k ON ev.room = k.room
JOIN
    employees e ON k.employee_id = e.employee_id
LEFT JOIN
    alibis a ON e.employee_id = a.employee_id;
```

- Output

Results | Messages

	evidence_id	evidence_room	description	found_time	name	actual_location	entry_time	claimed_location	claim_time	Alibi_Status
1	3	Server Room	Unusual access pattern	21:15:00.0000000	David Kumar	Server Room	08:50:00.0000000	Server Room	20:50:00.0000000	Alibi match
2	3	Server Room	Unusual access pattern	21:15:00.0000000	Henry Wu	Server Room	08:40:00.0000000	NULL	NULL	alibi not available
3	1	CEO Office	Fingerprint on desk	21:05:00.0000000	David Kumar	CEO Office	20:50:00.0000000	Server Room	20:50:00.0000000	Alibi Mismatch
4	2	CEO Office	Keycard swipe logs mismatch	21:10:00.0000000	David Kumar	CEO Office	20:50:00.0000000	Server Room	20:50:00.0000000	Alibi Mismatch

Investigation step- 6: Combine all findings to identify the killer

```sql
SELECT
    emp.name AS suspect,
    k.room AS actual_location,
    CAST(k.entry_time AS TIME) AS entry_time,
    CAST(k.exit_time AS TIME) AS exit_time,
    a.claimed_location,
    CAST(a.claim_time AS TIME) AS claim_time,
    evi.room AS evidence_room,
    evi.description AS evidence_found,
    CAST(evi.found_time AS TIME) AS found_time,
    CASE
        WHEN a.claimed_location IS NULL THEN 'No alibi'
        WHEN a.claimed_location = k.room THEN 'Alibi matches'
        ELSE 'Alibi mismatch'
    END AS alibi_status
FROM employees emp
JOIN keycard_logs k
    ON emp.employee_id = k.employee_id
JOIN evidence evi
    ON evi.room = k.room
    AND CAST(evi.found_time AS DATE) = CAST(k.entry_time AS DATE)
LEFT JOIN alibis a
    ON a.employee_id = emp.employee_id
    AND CAST(a.claim_time AS DATE) = CAST(k.entry_time AS DATE)
WHERE evi.room = 'CEO Office'
ORDER BY evi.found_time, emp.name;
```

- Output

Results | Messages

	suspect	actual_location	entry_time	exit_time	claimed_location	claim_time	evidence_room	evidence_found	found_time	alibi_status
1	David Kumar	CEO Office	20:50:00.0000000	21:00:00.0000000	Server Room	20:50:00.0000000	CEO Office	Fingerprint on desk	21:05:00.0000000	Alibi mismatch
2	David Kumar	CEO Office	20:50:00.0000000	21:00:00.0000000	Server Room	20:50:00.0000000	CEO Office	Keycard swipe logs mismatch	21:10:00.0000000	Alibi mismatch

Investigation findings

- The incident occurred in the CEO’s office at approximately **9:00 PM**.
- **David Kumar** accessed the CEO’s office during the critical time window.
- His stated location does **not** align with keycard and alibi records.
- He also made **two suspicious phone calls** during the same period.
- His movement data places him in both the **CEO’s office** and the **server room**, contradicting his claimed location and resulting in multiple **alibi mismatches**.
- All evidence items recovered from the CEO’s office align with the exact timeframe of his presence, making **David Kumar the primary suspect** in the investigation.

WHO IS THE MURDERER ?

- All evidence indicates that the perpetrator was present in the CEO's office at the time of the incident, provided false information about their whereabouts, made suspicious phone calls, and exhibited multiple alibi inconsistencies. Based on the complete investigation, the primary culprit is identified as ***David Kumar***.

THANK YOU!

- Please do connect me on for learning and growing together
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