Date: _____

DBS Assignment -3

Q1)

1) $\Pi\{Country\_Name\}$(
$\sigma\{Severity\_Level = 'Critical'$ AND
Date_Reported BETWEEN '2025-01-01' AND '2025-12-31'$\}$(
(INCIDENT ⋈ {INCIDENT.Threat_ID = THREAT.Threat_ID} THREAT)
⋈ {INCIDENT.Country_ID = COUNTRY.Country_ID} COUNTRY
)
)

Explanation :- Join INCIDENT → THREAT → COUNTRY, then filter incidents in 2025 whose threat severity = 'Critical', then finally project the country names.

2) $\Pi\{Team\_Name\}$
(
$\sigma\{Resolution\_Status = 'Resolved'$ AND
Threat_Name = 'Ransomware'$\}$
((ACTION_TAKEN ⋈ {ACTION_TAKEN.Incident_ID = INCIDENT.Incident_ID} INCIDENT)
⋈ {INCIDENT.Threat_ID = THREAT.Threat_ID} THREAT
⋈ {ACTION_TAKEN.Team_ID = RESPONSE_TEAM.Team_ID}
RESPONSE_TEAM
)
)

Explanation :- Find ACTION_TAKEN rows marked 'Resolved' for incidents whose threat is 'Ransomware', Join to Respo

Date:

Explanation:- Find ACTION_TEAM rows that are marked 'Resolved' for incidents whose threat is 'Ransomware', and join to RESPONSE_TEAM, and finally return the team names.

3)

π {Country_Name} (COUNTRY)

—

π {Country_Name}

(COUNTRY $\bowtie$ {COUNTRY.Country_ID = RESPONSE_TEAM.

country_ID} RESPONSE_TEAM

)

Explanation:- Take all country names & remove those countries ~~whose names~~ that appear in RESPONSE_TEAM i.e. countries that already have a team ~~name~~. The remainder are countries without any response team.

Date: _____

4) $T_{count} \leftarrow \gamma_{\{Threat\_ID;\ COUNT^{-DISTINCT}(Country\_ID) \rightarrow num\_countries\}}$ (INCIDENT)

$\pi_{\{Threat\_Name\}}$
($\sigma_{\{num\_countries > 1\}}$
($T_{count} \bowtie_{\{T_{count}.Threat\_ID = THREAT.Threat\_ID\}}$ THREAT)
)

Explanation:- GROUP ~~Incident~~ INCIDENT by Threat_ID counting distinct Country_ID, then pick threats with count > 1, then join with THREAT to get threat names, then project the ~~threat names~~. Threat_Name.

5)

$\pi_{\{Incident\_ID, Threat\_Name, Country\_Name, Impact\_Score\}}$
($\sigma_{\{Category = 'AI\ Attack'\ AND\ Impact\_Score > 80\}}$
((INCIDENT $\bowtie_{\{INCIDENT.Threat\_ID = THREAT.Threat\_ID\}}$ THREAT)
$\bowtie_{\{INCIDENT.Country\_ID = COUNTRY.Country\_ID\}}$ COUNTRY
)
)

Explanation:- Join INCIDENT → THREAT → COUNTRY, so then select rows where threat category = 'AI Attack' and impact score > 80, and return the incident id, threat name, country name and impact score.

Date:

Q2)

1) Display the names of menu items that are currently unavailable and priced above 500.

2) Show all menu items that are either 'Beverages' priced over 300 or belong to 'Dessert' category.

3) Retrieve the name and price of all available snacks.

4) Show each available snack and its price divided by 100.

5) List suppliers who provide the item "Cappuccino".

6) Displays the names of employees who live in the same city as the cafe they work in, along with cafe names.

7) Finds employees whose salary is not equal to 50,000.

8) Identifies suppliers that have branches or listings in both Karachi & Lahore.

9) Retrieves all menu items that have never been supplied by any supplier.