Module 3: Database Query Analysis

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Q: How many total applications were submitted for the Fall 2025 term?

Answer:
30 applications

Logic: Counts all rows where the term starts with 'Fall 2025'.

SQL:
```
SELECT COUNT(*) FROM applicants WHERE term LIKE 'Fall 2025%';
```

Q: What percentage of all applicants are international (non-American)?

Answer:
44.24%

Logic: Calculates the ratio of applicants who are not 'American' or 'Other' against the total count.

SQL:
```
SELECT ROUND(100.0 * COUNT(*) / (SELECT COUNT(*) FROM applicants), 2) FROM applicants WHERE
us_or_international NOT IN ('American', 'Other');
```

Q: What are the average GPA and GRE scores (Quant, Verbal, AW) across the entire dataset?

Answer:
GPA: 3.80 | GRE Quant: 279.68 | GRE Verbal: 161.24 | GRE AW: 4.20

Logic: Computes the average for GPA and all GRE sections, rounding to 2 decimal places.

SQL:
```
SELECT ROUND(AVG(gpa)::numeric, 2), ROUND(AVG(gre)::numeric, 2), ROUND(AVG(gre_v)::numeric, 2),
ROUND(AVG(gre_aw)::numeric, 2) FROM applicants;
```

Q: What is the average GPA of American students who applied for Fall 2025?

Answer:
3.78

Logic: Filters for American students in Fall 2025 and averages their GPA.

SQL:
```
SELECT ROUND(AVG(gpa)::numeric, 2) FROM applicants WHERE us_or_international = 'American' AND term
LIKE 'Fall 2025%';
```

Q: What is the overall acceptance rate for the Fall 2025 term?

Answer:
50.00%

Logic: Divides the number of 'Accepted' students by the total number of applicants for Fall 2025.

SQL:
```
SELECT ROUND(100.0 * COUNT(*) / NULLIF((SELECT COUNT(*) FROM applicants WHERE term LIKE 'Fall
2025%'), 0), 2) FROM applicants WHERE status = 'Accepted' AND term LIKE 'Fall 2025%';
```

Q: What is the average GPA of students who were accepted for Fall 2025?

Answer:
3.77

Logic: Averages the GPA only for students with 'Accepted' status in Fall 2025.

SQL:
```
SELECT ROUND(AVG(gpa)::numeric, 2) FROM applicants WHERE status = 'Accepted' AND term LIKE 'Fall 2025%';
```

Q: How many applicants for a Masters in Computer Science applied to Johns Hopkins (JHU)?

Answer:
1 applicants

Logic: Filters for JHU (using wildcards) and Masters CS programs.

SQL:
```
SELECT COUNT(*) FROM applicants WHERE (university ILIKE '%JHU%' OR university ILIKE '%Johns Hopkins%') AND degree = 'Masters' AND program ILIKE '%Computer Science%';
```

Q: Using original fields: How many CS PhD applicants were accepted to Georgetown, MIT, Stanford, or CMU in 2025?

Answer:
0 applicants

Logic: Counts accepted CS PhDs at 4 specific schools using the raw 'university' field.

SQL:
```
SELECT COUNT(*) FROM applicants WHERE EXTRACT(YEAR FROM date_added) = 2025 AND status = 'Accepted' AND university IN ('Georgetown University', 'MIT', 'Stanford University', 'Carnegie Mellon University') AND degree = 'PhD' AND program ILIKE '%Computer Science%';
```

Q: Using LLM fields: How many CS PhD applicants were accepted to Georgetown, MIT, Stanford, or CMU in 2025?

Answer:
0 applicants

Logic: Same as Q8 but uses the standardized 'llm_generated_university' field to catch variations.

SQL:
```
SELECT COUNT(*) FROM applicants WHERE EXTRACT(YEAR FROM date_added) = 2025 AND status = 'Accepted' AND llm_generated_university IN ('Georgetown University', 'MIT', 'Stanford University', 'Carnegie Mellon University') AND degree = 'PhD' AND llm_generated_program ILIKE '%Computer Science%';
```

Q: Extra Q1: Which academic program has the highest volume of application entries?

Answer:
Clinical Psychology (352 applications)

Logic: Groups by program name and sorts descending to find the most popular one.

SQL:
```
SELECT llm_generated_program, COUNT(*) as count FROM applicants GROUP BY 1 ORDER BY 2 DESC LIMIT 1;
```

Q: Extra Q2: How does the average GRE Quantitative score compare between PhD and Masters applicants?

Answer:

Masters: 268.53 | PhD: 283.84

Logic: Groups by degree type to compare average GRE scores side-by-side.

SQL:

```
SELECT degree, ROUND(AVG(gre)::numeric, 2) as avg_q FROM applicants WHERE degree IN ('PhD', 'Masters') GROUP BY 1;
```