

### Exercise 1

- The following relations are given (primary keys are underlined):
  - FINE(IDFine, Date, Time, ViolationType, Numberplate)
- Assume the following cardinalities:
  - $\text{card}(\text{FINE}) \approx 10^5$  tuples
  - $\text{card}(\text{Date} \geq 1/1/2005 \text{ and Date} \leq 31/12/2005 \text{ FINE}) \approx 10^5$  tuples
  - $\text{card}(\text{ViolationType}='Type10' \text{ FINE}) \approx 10^3$  tuples
  - $\text{card}(\text{ViolationType}='Type50' \text{ FINE}) \approx 9 * 10^4$  tuples

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### Query 1

```
SELECT Date, COUNT(*)
FROM FINE
WHERE Date ≥ 1/10/2005 and Date ≤ 1/12/2005
GROUP BY Date;
```

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### Query 2

```
SELECT Date, COUNT(*)
FROM FINE
WHERE Date ≥ 1/10/2005 and Date ≤ 1/12/2005
and ViolationType = 'Type50'
GROUP BY Date;
```

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### Query 3

```
SELECT Date, COUNT(*)
FROM FINE
WHERE Date ≥ 1/10/2005 and Date ≤ 1/12/2005
and ViolationType = 'Type10'
GROUP BY Date;
```

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