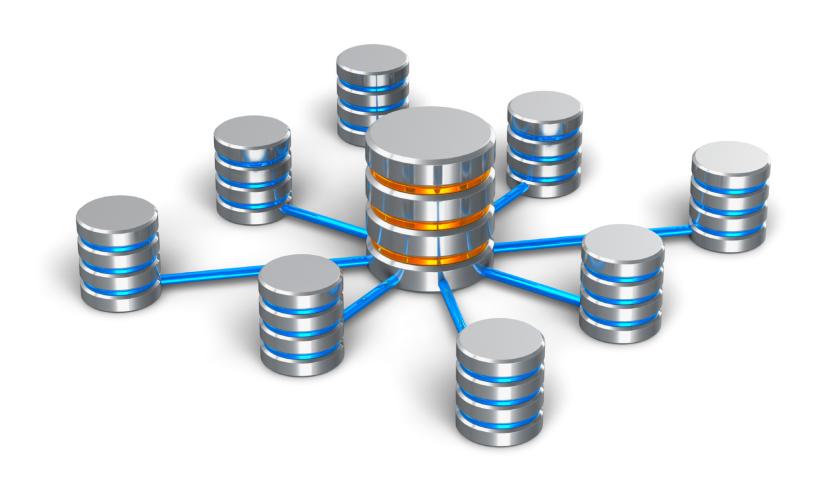
# CSE 180 - Midterm II Review



Dev November 9 2023, Section 6? 7?

## Aggregates

• COUNT, SUM, MAX, MIN, AVG

```
SELECT COUNT(*) FROM Subscribers;

SELECT COUNT(DISTINCT subscriberPhone) FROM Subscriptions;

SELECT COUNT(*) FROM Subscriptions WHERE subscriptionMode='D';

SELECT MAX(subscriptionInterval) FROM subscriptions;

SELECT AVG(rate) FROM SubscriptionKinds;
```

#### GROUP BY

- With a GROUP BY, any field in SELECT must be in the GROUP BY
- All other fields can only be aggregates
- GROUP BY usually eliminates duplicates
- NULLs are **NOT** ignored

SELECT subscriptionMode, COUNT(\*), AVG(rate)
FROM SubscriptionKinds
GROUP BY subscriptionMode;

#### HAVING

- Condition for the GROUP BY
- WHERE cannot be used here

SELECT articleAuthor, COUNT(\*) AS NumArticles
FROM articles
GROUP BY articleAuthor
HAVING COUNT(\*) > 1;

## INSERT, UPDATE, and DELETE

INSERT INTO

DELETE FROM 
WHERE <condition>

INSERT INTO 
SELECT ...

UPDATE 
SET <values>
WHERE <condition>

#### TRANSACTIONS

- Atomicity
- Consistency
- Isolation
- Durability

### ISOLATION LEVELS

**Table 13.1. Transaction Isolation Levels** 

Isolation Level	Dirty Read	Nonrepeatable Read	Phantom Read	Serialization Anomaly
Read uncommitted	Allowed, but not in PG	Possible	Possible	Possible
Read committed	Not possible	Possible	Possible	Possible
Repeatable read	Not possible	Not possible	Allowed, but not in PG	Possible
Serializable	Not possible	Not possible	Not possible	Not possible

## Views

- Short-hand/encapsulation:
- Re-use:
- Authorization:
- Logical data independence:
- What happens when a view is deleted?
- Can you update a view?
- What is a materialized view?

CREATE VIEW <name> AS SELECT...

### Indexes

- Why?
- How are queries impacted if indexes are dropped?
- Why not index everything?
- Advantages of indexing keys?

CREATE INDEX <name> ON Table(fields);

## Constraints

Actions on foreign key

RESTRICT

CASCADE

SET NULL

NOT NULL UNIQUE

FOREIGN KEY(key)

REFERENCES Table(name)

ON DELETE SET NULL

ON UPDATE CASCADE

#### CHECK

- CHECK (attribute <comparison> value)
- What is the difference between CHECK and FOREIGN KEY?