Lecture-21
SSK

Decomposition

Lending-schema = (branch-name, branch-city, assets, customer-name, loan-number, amount)

→ Branch-customer-schema = (branch-name, branch-city, assets, customer-name)

→ customer-loan-schema = (customer-name, loan-number, amount)

branch-customer

branch-name	branch-city	assets	customer-name
Downtown	Brooklyn	9000000	Jones
Redwood	Palo Alto	2100000	Smith
Perrybridge	Horseneck	1700000	Hayes
Downtown	Brooklyn	9000000	Jackson
Miamss	Horseneck	4000000	Jones
Round Hill	Horseneck	8000000	Turner

customer-loan

customer-name	loan-number	amount
Jones	L-17	1000
Smith	L-23	2000
Hayes	L-15	1500
Jackson	L-14	1500
Jones	L-93	500
Turner	L-11	900

branch-customer ⋈ customer-loan → natural join / by default equi-join (one of the attribute is common)

branch-name	branch-city	assets	customer-name	loan-number	amount
Downtown	Brooklyn	9000000	Jones	L-17	1000
Downtown	Brooklyn	9000000	Jones	L-93	500

one of these tuples is fake!

→ spurious tuples

Lossy decomposition - when spurious tuples are formed on decomposing a relational schema.
Lossless decomposition - when the original schema can be reconstructed after decomposition.
Dependency preserving decomposition - We have to preserve all the functional dependencies and try to retain as many dependencies as possible.

Lossless decomposition & dependency preserving decomposition are important for a redundancy-free schema for 3NF normalization.