

Original Table

cake_flavor	size	price
Chocolate Fudge	small	700
Vanilla Delight	medium	1500
Red Velvet	large	2100

1NF (First Normal Form)

- ✓ All values are atomic, no multivalued fields or repeating groups.
- ✓ **1NF is satisfied**

2NF (Second Normal Form)

- ✓ No **composite primary key** (let's assume the primary key is (cake_flavor, size)).
- ✓ Each non-key attribute (price) must be fully dependent on the whole primary key.
- ✓ price depends on both cake_flavor and size.
- ✓ **2NF is satisfied**

3NF (Third Normal Form)

- ✓ No transitive dependencies.
 - ✓ price depends only on (cake_flavor, size), and not on any other non-key attribute.
 - ✓ **3NF is satisfied**
-

BCNF (Boyce-Codd Normal Form)

- ✓ All determinants must be candidate keys.
 - ✓ The composite key (cake_flavor, size) determines price.
 - ✓ **BCNF is satisfied**
-

4NF (Fourth Normal Form)

- ✓ Check for multivalued dependencies:
 - ✓ If one flavor can come in multiple sizes **independently** of price, we may split flavor and size.
 - ✓ In current design:
 - ✓ Each (flavor, size) pair has a specific price.
 - ✓ No multivalued dependencies that violate 4NF.
 - ✓ **4NF is satisfied**
-

5NF (Fifth Normal Form)

- ✓ Would be needed **if** data is broken into multiple pieces that must be recombined via joins.
- ✓ No such complex join dependencies here.
- ✓ **5NF not needed**