

publishers

Let A = name

Let B = email

Let C = phoneNums

Let D = bankNum

Let E = address_uid

Relation(A, B, C, D, E)

Functional dependency = (

$B \rightarrow ACDE$

$D \rightarrow ABCE$

$E \rightarrow ABCD$

)

Since B determines all other attributes, and D determines all other attributes, and E determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

phone_nums

Let A = publisherEmail

Let B = phoneNumber

Relation(A, B)

Functional dependency = (

$AB \rightarrow AB$

)

Since AB determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

books

Let B = ISBN

Let C = name

Let D = pages

Let E = price

Let F = quantity

Let G = publisherSharePercentage

Let H = publisherEmail

Relation(B, C, D, E, F, G, H)

Functional Dependency = (

$B \rightarrow CDEFGH$

)

Since B determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

genres

Let A = BookISBN

Let B = Genre

Relation(A, B)

Functional dependency = (

$A \rightarrow B$

)

Since A determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

author_has_book

Let A = AuthorUID

Let B = BookISBN

Relation(A, B)

Functional dependency = (

$AB \rightarrow AB$

)

Since AB determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

authors

Let A = uid

Let B = fname

Let C = name

Relation(A, B, C)

Functional Dependency = (

$A \rightarrow BC$

)

Since A determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

order_has_book

Let A = book_isbn
Let B = order_num
Let C = price_per_unit
Let D = quantity

Relation(A, B, C, D)

Functional dependency = (
 $AB \rightarrow CD$
)

Since AB determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

orders

Let A = num
Let B = date_ordered
Let C = tracking_num
Let D = bill_num
Let E = bill_expiry
Let F = bill_digit_code_3
Let G = bill_fname
Let H = bill_lname
Let I = bill_street_num
Let J = bill_street
Let K = bill_city
Let L = bill_postal_code
Let M = bill_country
Let N = ship_street_num
Let O = ship_street
Let P = ship_sity
Let Q = ship_postal_code
Let R = ship_country
Let S = user_username

Relation(A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S)

Functional Dependency = (
 $A \rightarrow BCDEFGHIJKLMNOPQRS$
 $C \rightarrow ABDEFGHIJKLMNOPQRS$
)

Since A determines all other attributes, and C can determine all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

users

Let A = username

Let B = fname

Let C = name

Let D = password

Relation(A, B, C, D)

Functional dependency = (
 $A \rightarrow BCD$
)

Since A determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

userHasAddress

Let A = address_uid

Let B = user_username

Relation(A, B)

Functional dependency = (
 $AB \rightarrow AB$
)

Since AB determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

Addresses

Let A = uid

Let B = street_num

Let C = street

Let D = city

Let E = postal_code

Let F = country

Let G = type

Let H = name

Relation(A, B, C, D, E, F, G, H)

Functional dependency = (
 $A \rightarrow BCDEFGH$
)

Since A determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF

paymentcards

Let A = num
Let B = expiry
Let C = digit_code_3
Let D = fname
Let E = lname
Let F = user_username

Relation(A, B, C, D, E, F)

Functional dependency = (
 $A \rightarrow BCDEF$
)

Since A determines all other attributes, this dependency does not violate BCNF and therefore this relation is in BCNF