Users(user_id, first_name, last_name, email, username, password, join_date, current_points)

F = { user_id → first_name
user_id → last_name
user_id → email
user_id → username
user_id → password
user_id → join_date
user_id → current_point
username → user_id
email → user_id }

Candidate Keys: $(user\_id)^+ = R$ $(username)^+ = R$ $(email)^+ = R$
Primes - {user_id}, {username}, {email}
There is no BCNF violations because all dependencies are implied by superkeys

Authors(author_id, first_name, last_name, bio, birth_date, death_date, nationality)

F = { author_id → first_name
author_id → last_name
author_id → bio
author_id → birth_date
author_id → death_date
author_id → nationality }
Candidate Keys: $(author\_id)^+ = R$
Primes - {author}
There is no BCNF violations because all dependencies are implied by superkeys

Genres(genre_id, name)

F = {genre_id → name}

Candidate Keys: $(genre\_id)^+ = R$
Primes - {genre_id}
There is no BCNF violations because all dependencies are implied by superkeys

Series(series_id, name, description)

F = { series_id → name
series_id → description }

Candidate Keys: $(series\_id)^+ = R$
Primes - {series_id}

There is no BCNF violations because all dependencies are implied by superkeys

Publishers(publisher_id, name, country, city, street_number, building_number, founded_year)

F = {publisher_id → name
publisher_id → country
publisher_id → city
publisher_id → streey_number
publisher_id → building_number
publisher_id → founded_year }

Candidate Keys: $(\text{publisher\_id})^+ = R$

Primes - {publisher_id}

There is no BCNF violations because all dependencies are implied by superkeys

Books(book_id, title, description, series_id, author_id)

F = { book_id → title
book_id → description
book_id → series_id
book_id → author_id
title, series_id → book_id }

Candidate Keys: $(\text{book\_id})^+ = R$, $(\text{titles, series\_id})^+ = R$

Primes - {book_id}, {titles}, {series_id}

There is no BCNF violations because all dependencies are implied by superkeys

Awards(award_id, name, description, year_started)

F = { authod_id → name
author_id → description
author_id → year_started}

Candidate Keys: $(\text{award\_id})^+ = R$

Primes - {award_id}

There is no BCNF violations because all dependencies are implied by superkeys

Characters(character_id, name, role, description, series_id, book_id)

F = { character_id → name
character_id → role
character_id → description
character_id → series_ed
character_id → book_id }

Candidate Keys:$(character\_id)^+ = R$
Primes - {character_id}
There is no BCNF violations because all dependencies are implied by superkeys

Editions(edition_id, book_id, publisher_id, publication_date, page_count, format, language)

F = { edition_id → book_id
edition_id → publisher_id
edition_id → publication_date
edition_id → page_count
edition_id → format
edition_id → language
book_id, publisher_id, publication_date → edition_id}

Candidate Keys: $(edition\_id)^+ = R$, $(book\_id, publisher\_id, publication\_date)^+ = R$
Primes - {edition_id}, {book_id}, {publisher_id}, {publication_date}
There is no BCNF violations because all dependencies are implied by superkeys

Reviews(review_id, user_id, book_id, review_text, review_date)

F = { review_id → user_id
review_id → book_id
review_id → review_text
review_id → review_date}
user_id, review_date → review_id }

Candidate Keys: $(review\_id)^+ = R$, $(user\_id\ review\_date)^+ = R$
Primes - {review_id}, {user_id}, {review_date}
There is no BCNF violations because all dependencies are implied by superkeys

Comments(comment_id, comment_text, comment_date, user_id, review_id, parent_comment_id)

F = { comment_id → comment_text
comment_id → comment_date
comment_id → user_id
comment_id → review_id
user_id, comment_date → comment_id }

Candidate Keys: $(comment\_id)^+ = R$, $(user\_id\ comment\_date)^+ = R$
Primes - {review_id}, {user_id}, {comment_date}
There is no BCNF violations because all dependencies are implied by superkeys

Quotes(quote_id, quote_text, quote_date, book_id, user_id)

F = { quote_id → quote_text
quote_id → quote_date
quote_id → book_id
quote_id → user_id }

Candidate Keys: $(quote\_id)^+ = R$
Primes - {quote_id}
There is no BCNF violations because all dependencies are implied by superkeys

Bookshelves(shelf_id, user_id, shelf_name)

F = { shelf_id → user_id
shelf_id → shelf_name }

Candidate Keys: $(shelf\_id)^+ = R$
Primes - {shelf_id}
There is no BCNF violations because all dependencies are implied by superkeys

Challenges(challange_id, name, description, goal, duration, points)

F = { challange_id → name
challenge_id → description
challenge_id → goal
challenge_id → duration
challenge_id → points
goal, duration → challenge_id}

Candidate Keys: $(challenge\_id)^+ = R$, $(goal, duration)^+ = R$
Primes - {challenge_id}, {goal}, {duration}
There is no BCNF violations because all dependencies are implied by superkeys

Group_Discussion(group_id, name, description, max_people, participant_1, participant_2, participant_3, participant_4, participant_5, participant_6, participant_7)

F = { group_id → name
group_id → description
group_id → max_people
group_id → participant_1
group_id → participant_2
group_id → participant_3
group_id → participant_4

group_id → participant_5
group_id → participant_6
group_id → participant_7

Candidate Keys: $(group\_id)^+ = R$
Primes - {group_id}
There is no BCNF violations because all dependencies are implied by superkeys

Giveaways(giveaway_id, name, description, cost_in_points)

F = { giveaway_id → name
giveaway_id → description
giveaway_id → cost_in_points }

Candidate Keys: $(giveaway\_id)^+ = R$
Primes - {giveaway_id}
There is no BCNF violations because all dependencies are implied by superkeys

BookshelfBooks(shelf_id, book_id, status, progress, last_updated)

F = { shelf_id, book_id → status
shelf_id, book_id → progress
shelf_id, book_id → last_updated}

Candidate Keys: $(shelf\_id, book\_id)^+ = R$
Primes - {shelf_id}, {book_id}
There is no BCNF violations because all dependencies are implied by superkeys

BookGenres(book_id, genre_id)

No relations here both are independent candidate keys

BookAwards(book_id, award_id, year_won)

No relations here both are independent candidate keys

Friendships(user_id1, user_id2, friendship_date)

No relations here both are independent candidate keys

Ratings(user_id, book_id, rating, rating_date)

F = { user_id, book_id → rating
user_id, book_id → rating_date }

Candidate Keys: $(user\_id, book\_id)^+ = R$
Primes - {user_id}, {book_id}
There is no BCNF violations because all dependencies are implied by superkeys

ChallengeParticipation(user_id, challenge_id, date_joined, state)

F = { user_id, challenge_id → date_joined
user_id, challenge_id → state }

Candidate Keys: $(user\_id, challenge\_id)^+ = R$
Primes - {user_id}, {challenge_id}
There is no BCNF violations because all dependencies are implied by superkeys

GiveawayWins(user_id, giveaway_id, win_date)

F = { user_id, giveaway_id → win_date }

Candidate Keys: $(user\_id, giveaway\_id)^+ = R$
Primes - {user_id}, {giveaway_id}
There is no BCNF violations because all dependencies are implied by superkeys

BookRecommendation(user_id, book_id, reason)

F = { user_id, book_id → reason }

Candidate Keys: $(user\_id, book\_id)^+ = R$
Primes - {user_id}, {book_id}
There is no BCNF violations because all dependencies are implied by superkeys