BCNF Evaluation Tables

1) Company

FDS are as,

CompId → Name, Address, Tel, Mob, DOR (P.K)
Name → CompId, Add, tel, Mob, DoR (UNIQUE)

C.K = {CompId, Name}

R.H.S is S.K so Company table in BCNF

2) Product Group

FDs are as,

GroupID → GroupName, CompId
GroupName → GroupId (UNIQUE)

C.K = {GID, GroupName}

R.H.S is S.K so ProductGroup is in BCNF

3) Product Category

FDs are as,

CategoryID → CName, GroupID, CompId
CategoryName → CategoryId (UNIQUE)

C.K = {CategoryID, CategoryName}

Since R.H.S is S.K hence, ProductCategory is in BCNF

4) Stock

Fds

StockId → CompId, PrdId, StockQty, Last Upd.

CompId, PrdId → StockQuantity, LastUpdated ✓

StockId a surrogate key, whereas (CompId PrdId) is also a determinant but not P.K, making (CompId, PrdId) primary key and removing StockId from the table makes it in BCNF.

CompId, PrdId → StockQuantity, LastUpdated

5) AccountDetails

AccountDetailID → VoucherNo, Vouchertype, AcctId, Debt, Credit, CompId, date, saleId, PurchaseId ✓

i) Sale → AcctId ✗

ii) PurchaseId → AcctId ✗

iii) ActId → CompId ✗

Make (VoucherNo, Vouchertype, ActId) → Debt, Credit, Date, SaleId, PurchaseId

a composite key that removes FDs (i) & (ii).

Hence, now in BCNF

6) Inventory FDs:-

InventoryID → VoucherNo, VoucherType, PrdId, QtyIn, QtyOut, ActId + ... (All) ✓

i) PurchaseId → PrdId, CompId, ActId ✗
ii) SaleId → PrdId, CompId, ActId ✗
iii) ActId → CompId ✗

FDs i), ii), iii) don't have R.H.S as S.K so make a composite key

(VoucherNo, Voucher type, PrdId) → QtyIn, QtyOut, Entrydate, Discount, totalamount ... ✓

determines all attributes and in BCNF

7) Purchase Details

FDs are as,

✗ PurchaseDetailID → PId, PrdId, Quantity, Price

✓ PurchaseId, PrdId → Quantity, Price

It is a determinant but not C.K, remove PurchasedetailId so that (PurchaseId, PrdId) becomes primary key and afterall PurchasedetailId is unnecessary.

So it gets in BCNF

8) Sales Detail

SDId → SaleId, PrdId, Qty, Sale Price

SaleId, PrdId → Qty, SalePrice

↓ is a determinant not P.K, hence remove SDId so that (SaleId, PrdId) becomes P.K, since SDId is unnecessary, thus remove it to get the table in BCNF.

SaleId, PrdId → Qty, SalePrice

9) Users

FDs as,

UserId → UserName, Password, UserRole, CompId ✓

Username → UserId ✓

Both FD's have R.H.S as S.K so in BCNF

10) Payments

FDs as,

PaymentId → CompId, ActId, Paymenttype, Amount, CashBankID, Date, VoucherNo, Reference, SaleId PurchaseId

Since, its the C.K with R.H.S being S.K

It is in BCNF

11) Supplier Products

Fds as,

SupplierId, PrdId → {} (Pure relationship)

Hence, in BCNF

12) Sales

Fds as,

SaleId → CompId, CustomerId, TotalAmount, Discount, VoucherNo, SaleDate

C.K = {SaleId}

Since, R.H.S is S.K, hence BCNF

13) Products

PrdId → All attributes

PrdCode → PrdId (UNIQUE)

C.K = {PrdId, PrdCode}

Hence, in BCNF since R.H.S is S.K

14) Accounts

AcctId → ActName, Address, tel, Mob, Mail, CompId, ActType

Email → ActId (UNIQUE)

C.K = {Email, ActId}

Since R.H.S is S.K, hence BCNF

15) Purchases

FDs as,

PurchaseId → CompId, SupplierId, TotalAmount, VoucherNo, PurchaseDate

C.K = {PurchaseId}

Since R.H.S is S.K, hence in BCNF.