Minimal FDs & Normalization Proofs

# Team-5 (DBMS-4)

# Stock-Management App

**MINIMAL FDs-:**

TABLE 1 : UserInfo Table-

USERID->Name

USERID->PAN NO.

USERID->DOB

USERID->EMAILID

USERID->PHONE NO.

TABLE 2: Watchlist Table-

WATCHLIST ID ->USERID

WATCHLIST ID->WATCHLIST NAME

WATCHLIST ID->WATCHCREATIONDATE

TABLE 3: Portfolio Table-

PORTFOLIO ID -> USERID

PORTFOLIO ID->CREATION DATE

PORTFOLIO ID->NAME

PORTFOLIO ID->TRANSACTION ID

TABLE 4: Transaction Table-

TRANSACTION ID->QUANTITY

TRANSACTION ID->TRANSACTION TYPE

TRANSACTION ID->BUYING PRICE

TRANSACTION ID->TRANSACTION DATE

TRANSACTION ID->STOCKNAME

TRANSACTION ID->Exchange

TABLE 5: Stock Table-

{STOCKNAME, Exchange} ->FaceValue

{STOCKNAME, Exchange} ->COMPANY NAME

{STOCKNAME, Exchange} ->SECTOR ID

TABLE 6: Sector Table-

SECTOR ID ->SECTOR NAME

TABLE 7 : Price Table-

{STOCKNAME, Exchange, Date} –> Opening Price

{STOCKNAME, Exchange, Date} –> Closing Price

{STOCKNAME, Exchange, Date} ->Capitalization

TABLE 8: Watchlist Table-

WATCHLIST ID->STOCKNAME

WATCHLIST ID->EXCHANGE

**Proving BCNF-:**

TO PROVE- All the relations are in BCNF

For a relation to be in BCNF,

FD X->Y must have X to be super key or candidate key

**FOR TABLE 1-**

LET X BE USERID

Y BE {Name, PAN NO., DOB, EMAIL ID, PHONE NO., WATCHLIST}

AS USERID-> {Name, PAN NO., DOB, EMAIL ID, PHONE NO., WATCHLIST}

ALSO, USERID is primary key of TABLE 1

THEREFORE, WE CAN SAY THAT TABLE 1 IS IN BCNF.

**FOR TABLE 2-**

LET X BE WATCHLIST ID

Y BE {WATCHLIST NAME, WATCHLISTCREATIONDATE}

AS WATCHLIST ID-> {WATCHLIST NAME, WATCHLISTCREATIONDATE}

ALSO, WATCHLIST ID is primary key of TABLE 2

THEREFORE, WE CAN SAY THAT TABLE 2 IS IN BCNF

**FOR TABLE 3-**

LET X BE PORTFOLIO ID

Y BE {NAME, CREATIONDATE, QUANTITY}

AS PORTFOLIO ID -> {NAME, CREATIONDATE, QUANTITY}

ALSO, PORTFOLIO ID is primary key of TABLE 3

THEREFORE, WE CAN SAY THAT TABLE 3 IS IN BCNF

**FOR TABLE 4-**

LET X BE TRANSCATION ID

Y BE {STOCKNAME, TRANSCATION TYPE, TRANSCATION DATE, QUANTITY, BUYING PRICE, Exchange}

AS TRANSCATION ID -> {STOCKNAME, TRANSCATION TYPE, TRANSCATION DATE, QUANTITY, BUYING PRICE, Exchange}

ALSO, TRANSCATION ID is primary key of TABLE 4

THEREFORE, WE CAN SAY THAT TABLE 4 IS IN BCNF

**FOR TABLE 5-**

LET X BE {STOCKNAME, Exchange}

Y BE {COMPANY NAME, FaceValue, SECTOR ID}

AS {STOCKNAME, Exchange}-> {COMPANY NAME, FaceValue, SECTOR ID}

ALSO, {STOCKNAME, Exchange} is key of TABLE 5

THEREFORE, WE CAN SAY THAT TABLE 5 IS IN BCNF

**FOR TABLE 6-**

LET X BE SECTOR ID

Y BE SECTOR NAME

AS SECTOR ID -> SECTOR NAME

ALSO, SECTOR ID is Primary key of TABLE 6

THEREFORE, WE CAN SAY THAT TABLE 6 IS IN BCNF

**FOR TABLE 7-**

LET X BE {STOCKNAME, Exchange, Date}

Y BE {Opening Price, Closing Price, Capitalization}

AS {STOCKNAME, Exchange, Date}-> {Opening Price, Closing Price, Capitalization}

ALSO, {STOCKNAME, Exchange, Date} is the key of TABLE 7

THEREFORE, WE CAN SAY THAT TABLE 7 IS IN BCNF

**FOR TABLE 8-**

LET X BE WATCHLIST ID (SubKey of the primary key)

Y BE { STOCKNAME, EXCHANGE }

AS WATCHLIST ID-> { STOCKNAME, EXCHANGE }

ALSO, WATCHLIST ID is Candidate key of TABLE 5

THEREFORE, WE CAN SAY THAT TABLE 5 IS IN BCNF