- FU1

  $R_1(ID, name/lastname, Phone, username)$ (١ سؤال)

  ID → name, lastname, Phone, username ①

  !لكن username → name, lastname ②

  Phone → username ③

  Key → ID   → BCNF → ① ✓   ②، ③ ✗

  آخرين سؤال ٢و → $R_1.userInfo$ (username, name, lastname) ✓

            $R_1.Account$ (ID, Phone, username) ✓

  ③ ⤷ $R_1.contantuser$ (Phone, username)

           $R_1.Accout$ (ID, Phone) ✓

- FU2 $R_2.Contact$ (ID, userID, ChatID)

  ⤷ ID → 1, 2

  ChatID, userID → ID

  Key = ID, (Chat, user ID)

  All BCNF! ✓

- FU3. Chat → Chat(ID, first ID, seconduserID)

                (FID)   (SID)

  FU → ID → FID, SID

  All BCNF   ID = Key

- Chat message →

     Key = ID

  ID → All other attr

  text → TimeStamp

  Chat   ID, user ID → text, Timestamp   [not BCNF

  ⤷ $R_{texttime}$ (text, timestamp)   ✓

  $R_{chatmessage}$ (ID, userID, ChatID, text) ✓

FD4
  Group ⟶
          ID ⟶ name   All BCNF ✓

FD5   Group Users ⟶
          ID ⟶ GroupID, userID   All BCNF ✓

FD6   Group message ⟶
     ID ⟶ Group ID, userID, text, Timestamp

     text ⟶ Timestamp ⟶ not BCNF

     ⟶ R Groups text time (text , Timestamp)

        R (ID , Group ID, userID, text)
          Group message

Relationها کی سمت ⟶ more Join !!!
کویری تر راست

              Join and redundancy
                  trade off