Assignment 4: Normalization

Problem 1) A → D, AE → H, DF → BC, E → C, H → E

1. **A->AD:**
   If A->A and A->D, then A->AD (union)

2. **A->DH:** Cannot

3. **AED->C:**
   If AE->H and H->E, then AE->E (transitivity)
   If AE->E and E->C, then AE->C (transitivity)
   If AE->C, then AED->DC (augmentation)
   If AED->DC, then AED->D and AED->C (decomposition)

4. **DH->C:**
   If H->E and E->C, then H->C (union)
   If H->C, then DH->DC (augmentation)
   If DH->DC, then DH->D and DH->C (decomposition)

5. **ADF->E:** Cannot

Problem 2)

1) Original table is in 1NF:
   Primary keys: NIN, contractNo

NIN	contractNo	hoursPerWeek	eName	hotelNo	hotelLocation

2) The table in 2NF:
   Primary keys: NIN, contractNo

NIN	eName

contractNo	hotelNo	hotelLocation

NIN	contractNo	hoursPerWeek

3) The table in 3NF, BCNF:
   Primary keys: NIN, contractNo, hotelNo

NIN	eName

contractNo	hotelNo

hotelNo	hotelLocation

NIN	contractNo	housePerWeek

Problem 3)

1) Table in 1NF:
   Primark key: staffNo, apptDate, apptTime

staffNo	apptDate	apptTime	dentistName	patientNo	patientName	surgeryNo

2) Table in 2NF:
   Primark key: staffNo, apptDate, apptTime

staffNo	apptDate	apptTime	patientNo	patientName

staffNo	dentistName

staffNo	appDate	surgeryNo

3) Table in 3NF, BCNF:
   Primary key: staffNo, apptDate, apptTime, patientNo
   Foreign key: patientNo

staffNo	apptDate	apptTime	patientNo

patientNo	patientName

staffNo	dentistName

staffNo	appDate	surgeryNo