



# RELATIONAL DATABASES

NORMALISATION PRACTICE

# NORMALISATION PRACTICE

- An agency called *Instantcover* supplies part-time/temporary staff to hotels throughout Scotland. The following table lists the time spent by agency staff working at two hotels.
- NIN is the national insurance number and is unique to each employee.

# NORMALISATION PRACTICE

NIN	contractNo	hoursPerWeek	eName	workDone	hotelNo	hotelLocation
113567WD	C1024	16	John Smith	Maintenance, Cleaning	H25	Edinburgh
234111XA	C1024	24	Diane Hocine	Service	H25	Edinburgh
712670YD	C1025	28	Sarah White	Supervision	H4	Glasgow
113567WD	C1025	16	John Smith	Maintenance, Painting	H4	Glasgow

**This set of data is susceptible to update anomalies. We can find examples of insertion, deletion and modification anomalies.**

NIN	contractNo	hoursPerWeek	eName	hotelNo	hotelLocation
113567WD	C1024	16	John Smith	H25	Edinburgh
234111XA	C1024	24	Diane Hocine	H25	Edinburgh
712670YD	C1025	28	Sarah White	H4	Glasgow
113567WD	C1025	16	James Stanley	H4	Glasgow

- NIN and contractNo can be candidate keys.
- To insert new data, we would need to have hotel, employee and contract details.
- If we deleted a record about John Smith it would also delete the contract details too.
- If we changed the value of an employee name, several records need to be changed.
- There are no mult-value attributes, however we can see a repeating group of data in hotelLocation.

**1NF:** removal of multivalued attributes. In this case we have no multivalued attributes so the relation is in 1NF.

**ContractWork:** (NIN, contractNo, hoursPerWeek, eName, hotelNo, hotelLocation)

**2NF:** all attributes must be totally dependent on the whole key.

hoursPerWeek is dependent on both parts of the key.

eName is only dependent on NIN.

hotelNo is only dependent on contractNo

hotelLocation is only dependent on contractNo.

Remove the attributes that are dependent only part of the key into a new relation, the part of the key they are dependent on becomes the key for the new relation.

**ContractWork:** (NIN, contractNo, hoursPerWeek)

**Employee:** (NIN, eName)

**ContractHotel:** (contractNo, hotelNo, hotelLocation)

**3NF:** remove all transitive dependencies from the relations.

hotelLocation is dependent on hotelNo

Remove the attribute that is dependent into a new relation, use the attribute it was dependent on as the key for the new relation.

**ContractWork:** (NIN, contractNo, hoursPerWeek)

**Employee:** (NIN, eName)

**Contract:** (contractNo, hotelNo)

**Hotel:** (hotelNo, hotelLocation)

This process is conducted in situations where you have existing data in forms, reports, excel sheets. It helps the process of identifying entities and attributes as well as relationships. Then you can start to draw the EER diagram.

If you start with the EER you still do the normalization process just applying it to the entities you have drawn to double check it conforms to the rules.