

Normalisation Exercises ANSWERS

In these exercises, rather than drawing a table for a relation I will use a notation of: relation-name{attribute list}. IE the relation name is stated then a list of attributes is put inside brackets. Any attributes which are part of the primary keys are underlines

1. Choose a key and write the dependencies for the following GRADES relation:

- GRADES (Student ID, Course#, Semester#, Grade)
- Student_id, course# semester# → grade

2. What normal form is the following relation in:

- STORE_ITEM (SKU, PromotionID, Vendor, Style, Price)
- SKU, PromotionID → Vendor, Style, Price
- SKU → Vendor, Style

First normal form – vendor and style only needs SKU

3. Normalize the above relation into the next higher normal form

Store_item(SKU, Promotion ID, Price)

Vendor_Item(SKU, Vendor, Style)

4. What normal form is the following relation in (only H,I can act as the key):

- STUFF (H, I, J, K, L, M, N, O)
- H, I → J, K, L
- J → M
- K → N
- L → O

2NF – transitive dependencies exist

5. Consider the following relation:

- Shipping (ShipName, ShipType, VoyageID, Cargo, Port, Date) Hint: Date is the date the ship arrives in the given Port
- With the functional dependencies:
 - ShipName → ShipType
 - VoyageID → ShipName, Cargo
 - ShipName, Date → VoyageID, Port

- (a) Identify the primary keys.

ShipName, VoyageID

- (b) Normalize to 3NF

Ship(ShipName, ShipType)

Voyage(VoyageID, ShipName, Cargo)

Location(ShipName, Date, VoyageID, Port)

6. What normal form is this table? A course occurrence is a single offering of a course

Course Occ	Course Title	Start	Finish	Person Id	Surname	First name	Phone
IN605001-10.01(Forth)	Databases 2	15/02/2010	25/06/2010	1171334	Brown	Sidney	(09) 476 1652
IN605001-10.01(Forth)	Databases 2	15/02/2010	25/06/2010	1171334	Brown	Sidney	(021) 113 1230
IN605001-10.01(Forth)	Databases 2	15/02/2010	25/06/2010	1171334	Brown	Sidney	(08) 470 6253
IN605001-10.01(Forth)	Databases 2	15/02/2010	25/06/2010	1171334	Brown	Sidney	(08) 472 1111
IN605001-10.01(Forth)	Databases 2	15/02/2010	25/06/2010	1958346	Campbell	Jennifer	(03) 476 5892

7. Convert this table to Third Normal Form

Course(CourseId, CourseTitle)

Occurrence(CourseOccId, Start, Finish)

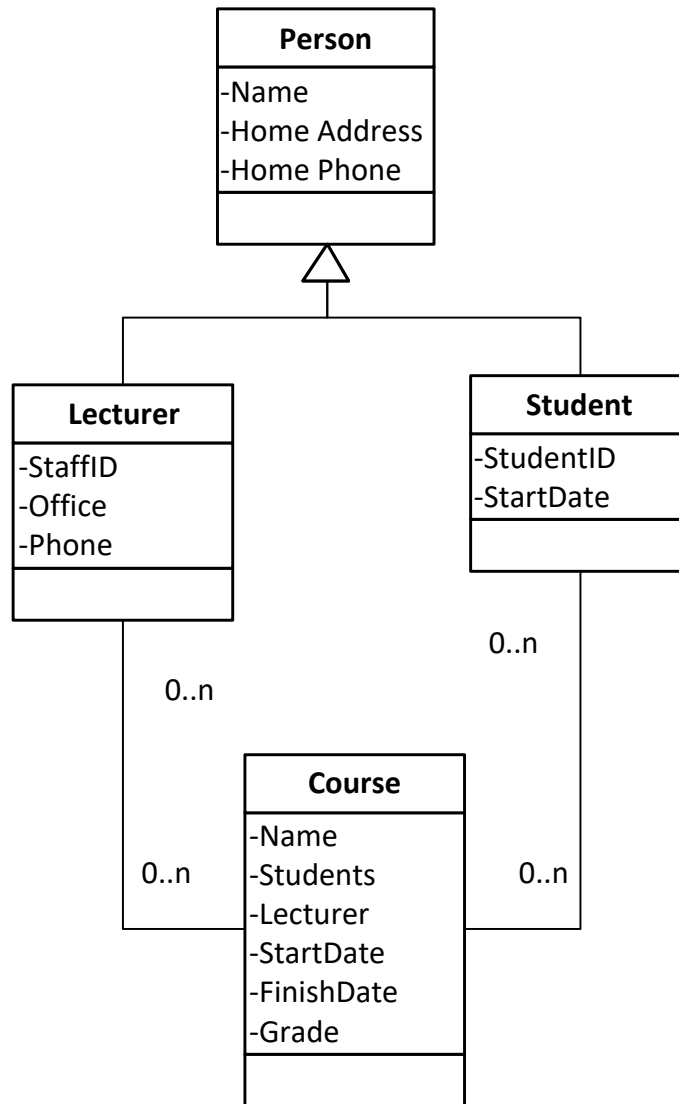
Person(PersonId, Surname, FirstName)

Phone(PersonId, PhoneNumber)

OccurrenceCourse(CourseOccId, CourseId)

OccurrencePerson(CourseOccId, PersonId)

8. Convert this conceptual model into a Third Normal Form logical model. Add any attribute you think would be sensible.



Expand address table and include home phone (multiple students could have same address).

Expand Office table and include phone number (office has phone number).

Expand course table holding course id and name.

Introduce CourseOccurrence table with start and finish.

Introduce associative tables LecturerCourseOccurrence and StudentCourseOccurrence. Move Grade into StudentCourseOccurrence.