Higher Computing Science

Database Design: Exercise 1 Cardinality & ER

Exercise 1 – Answers

1. *(a)* One-to-one

   (b) Many-to-many

   (c) One-to-many

   (d) Many-to-many

   (e) One-to-many

2. *(a)* Entities: Shop and Worker
   Cardinality: One-to-many

   (b) Entities: Manager and Department
   Cardinality: One-to-one

   (c) Entities: Resort and Hotel
   Cardinality: One-to-many

   (d) Entities: Team and Player
   Cardinality: One-to-many

   (e) Entities: Lecturer and Course
   Cardinality: One-to-one

   (f) Entities: Flight and Airport
   Cardinality: Many-to-many

   (g) Entities: Order and Product
   Cardinality: Many-to-many

   (h) Entities: Customer and Order
   Cardinality: One-to-many

3. *(a)* One-to-many

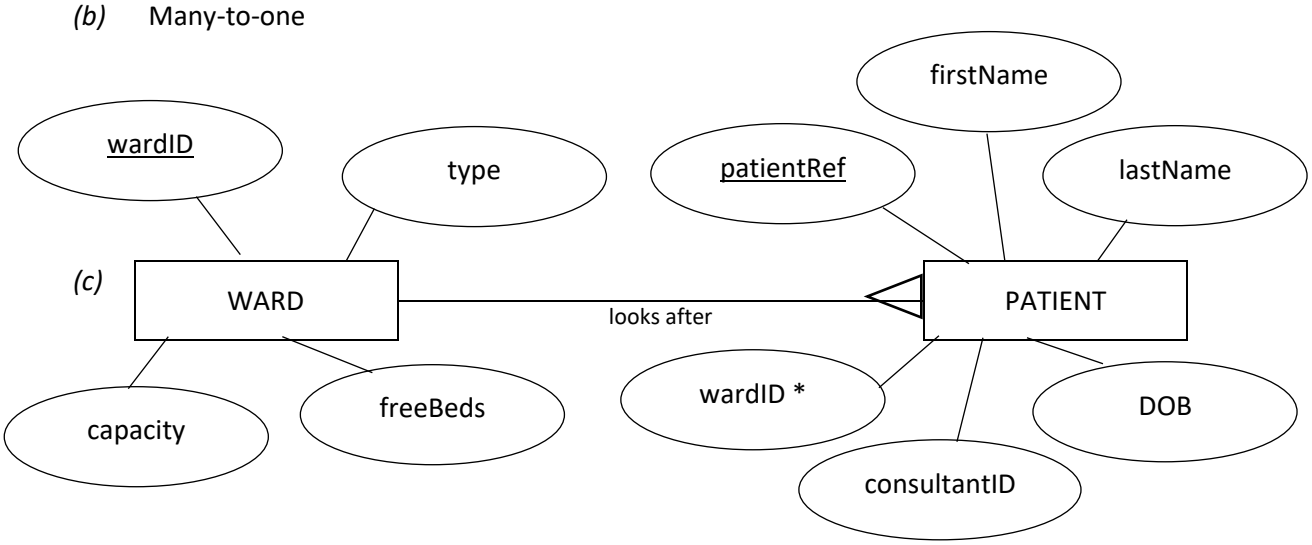
   (b) Each degree is studied by many students and each student studies many degrees.

4. *(a)* For example:

WARD Entity	**PATIENT Entity**
wardID	patientRef
type	firstName
capacity	lastName
freeBeds	DOB
	consultantID
	wardID *

(b) Many-to-one

(c)



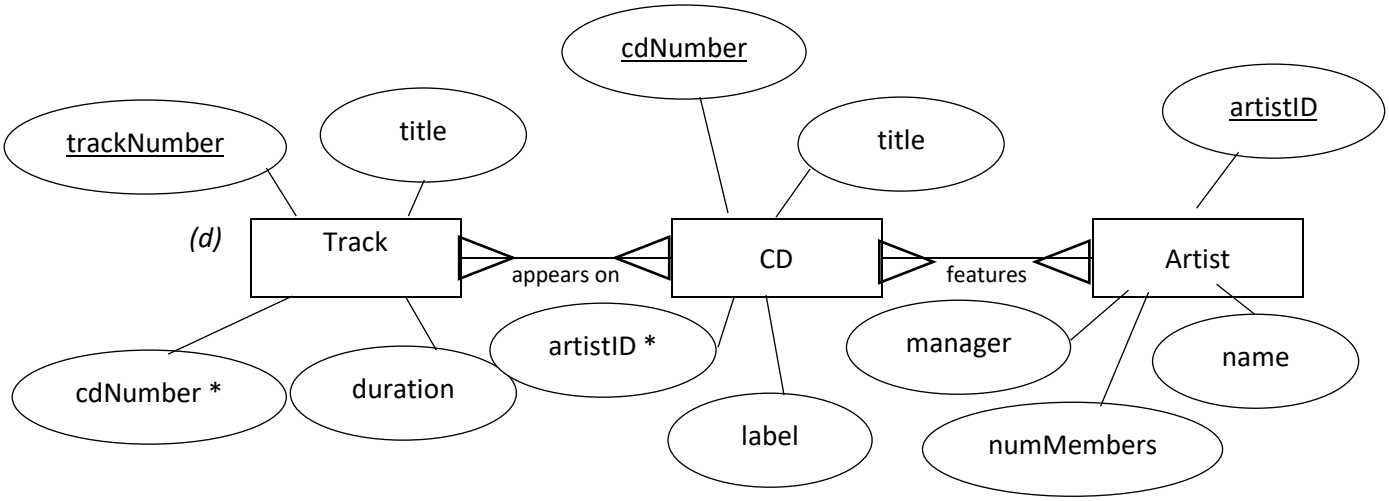
5. *(a)* For example:

CD Entity	**Track Entity**	**Artist Entity**
cdNumber	trackNumber	artistID
title	cdNumber *	name
label	title	numMembers
artisitID *	duration	manager

(b) Many-to-many

(c) Many-to-many

(d)



6. *(a)* **Patient: Consultant** is a one-to-many relationship
Consultant: MedicalTopic is a one-to-many relationship

(b) **Patient: Consultant**
Each patient is treated by one consultant and each consultant treats many patients.
Consultant: MedicalTopic
Each consultant specialises in one medical topic and each medical topic is the specialism of many consultants.

7. *(a)* **Engineer: Project** is a many-to-many relationship
Project: Manager is a one-to-many relationship

(b) **Engineer: Project**
Each engineer works on many projects and each project has many engineers working on it.
Project: Manager
Each project is managed by one manager and each manager manages many projects.