

Chapter 8 Student Book Answers

8.1 What you should already know

- 1 Suggestions to discuss include
 - School database
 - Database of births
 - Examination board entries
 - Doctors records
 - Social media records, for example Facebook users

- 2 a) Suggestions include:
 - Access
 - Oracle
 - dBase
 - MySQL
 - Filemaker
 b) storage space not wasted, reduction in redundant data stored, consistent data, independent data.

- 3 a) See glossary

 b) See Section 8.1 – key terms

 c) A normalised relational database is a data base in 3NF, where entities do not contain repeated groups of attributes, any non-key attributes depend upon the primary key and are independent, there are no partial dependencies, and the table contains no non-key dependencies.

Activity 8A

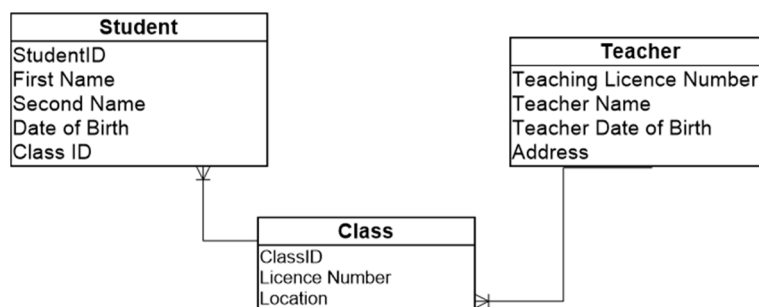
Staff Name and staff number are stored twice so there is redundant data.

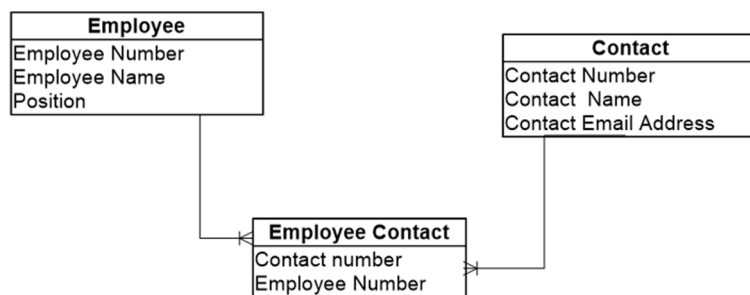
Data could be inconsistent if the staff number was altered in the payroll file and not the sales file or vice versa.

The data is not independent, for example, the fields are stored in a different order and in the payroll file the first name and second name are stored in different fields, but in the sales program they are stored together in the same field.

Activity 8B

Attributes for the table Teacher: teaching licence number, date of birth, address





E-R Diagram

Activity 8E

- 1 a) i) See Section 8.1.1
ii) See Section 8.1.2

b)

- i) Normalisation is the process of organising data to be stored in a database into two or more tables and relationships between the tables, so that data redundancy is minimised.
- ii) Normalisation is carried out by the following:
- **First Normal Form (1NF)** – ensuring that entities do not contain repeated groups of attributes.
 - **Second Normal Form (2NF)** – ensuring that entities are in 1NF and any non-key attributes depend upon the primary key. There are no partial dependencies.
 - **Third Normal Form (3NF)** – ensuring that entities are in 2NF and all non-key attributes are independent. The table contains no non-key dependencies.

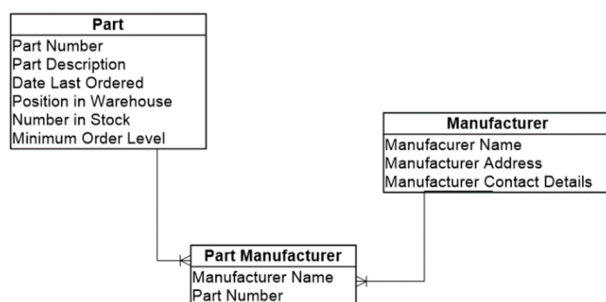
2 a)

Part (Part Number, Part Description, Date Last Ordered, Number in Stock, Minimum Order Level, Position in Warehouse)

Manufacturer (Manufacturer Name, Manufacturer Address, Manufacturer Contact Details)

Part Manufacturer (Part Number, Manufacturer Name)

b)



8.2 What you should already know

- 1 a) Depends on student, probably MySQL or Access
b) Suggestions include parts database, school database, employee database
- 2 a) Back-up is a copy of a file in case the original is destroyed or corrupted.
b) Access rights are the permissions given to database users to access, modify or delete data.
c) Back-up ensures that if data is destroyed or corrupted it can be replaced; access rights help to prevent unauthorised access to data.

Activity 8F

- 1 a) See Section 8.2.1
- b) See Section 8.2.1 last paragraph
- 2 a) See Section 8.2.1 and 8.2.2
- b) The use of access rights to limit what can be seen or changed:
 - Administrators would have full access rights to everything.
 - Teachers may be able to see most items but only change details about themselves and their pupils.
 - Pupils may only have the right to see data about themselves but not change it.

8.3 What you should already know

1

Field:	TeacherName	SubjectName	
Table:	TEACHER	SUBJECT	
Sort:			
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Criteria:			
or:			

2

Field:	FirstName	SecondName	ClassID
Table:	STUDENT	STUDENT	STUDENT
Sort:		Ascending	
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Criteria:			"7A"
or:			

3

Field:	FirstName	SecondName	SubjectName
Table:	STUDENT	STUDENT	STUDENTSUBJECT
Sort:			Ascending
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			
or:			

Activity 8G

```
CREATE TABLE Teacher(
    TeacherName CHARACTER,
    Address CHARACTER,
    TeacherDateOfBirth DATE);
ALTER TABLE Teacher ADD PRIMARY KEY (LicenceNumber);
ALTER TABLE Class ADD FOREIGN KEY LicenceNumber REFERENCES Teacher (LicenceNumber);
```

Activity 8H

```
SELECT STUDENT.FirstName, STUDENT.SecondName, STUDENTSUBJECT.SubjectName
FROM STUDENT INNER JOIN STUDENTSUBJECT ON STUDENT.StudentID = STUDENTSUBJECT.StudentID
ORDER BY STUDENTSUBJECT.SubjectName;
```

Activity 8I

```
SELECT COUNT (STUDENTSUBJECT.ExamMark)
FROM STUDENTSUBJECT;
```

```
SELECT AVG (STUDENTSUBJECT.ExamMark)
FROM STUDENTSUBJECT;
```

8.4 End of chapter questions

1 a) ProgDev table has repeated group of attributes.

b)

FirstName	Team
Alice	WC
Charles	PC
Ahmed	QR

FirstName	ProgramName	NoOfDays	Customer
Alice	TV control	3	SKM
Alice	Ice alert	2	WZP
Alice	Digital camera	6	HNC
Charles	Oil flow	1	GEB
Charles	Rescue pack	8	BGF
Ahmed	TV control	2	SKM
Ahmed	Accounts	8	ARC
Ahmed	Digital camera	4	HNC
Ahmed	Test Pack	3	GKN

- i) The primary key of the Programmer table is FirstName. This links to FirstName (foreign key) in Program.
- ii) There is a non-key dependency Customer is dependent on ProgramName, (which is not the primary key of the Program table).
- iii) Programmer (FirstName, Team)
 ProgramWorkDone (FirstName, ProgramName, NoOfDays)
 Program (ProgramName, Customer)

2 a)

- i)** Database Management System
- ii)** Issue usernames and passwords to stop unauthorised access to the data. Set access rights so only relevant staff can edit certain parts of the data.
- iii)** Setup search criteria to find the data that matches the criteria set
- iv)** By storing data in (separate) linked tables data redundancy is reduced/data duplication is controlled. Compatibility/data integrity issues are reduced as data only needs to be updated once/is only stored once. Unwanted or accidental deletion of linked data is prevented as the DBMS will flag an error.

b) i) The Primary Key in CLASS is ClassID. The Foreign Key of CLASS-GROUP is ClassID.

ii) Many-to-one

iii)

```
SELECT StudentID, FirstName
FROM STUDENT
WHERE TutorGroup = "10B" // WHERE (TutorGroup = "10B")
ORDER BY LastName ASC;
```

iv)

```
SELECT STUDENT.LastName
FROM STUDENT, CLASS-GROUP
WHERE ClassID = "CS1" // WHERE (ClassID = "CS1") AND CLASS-
GROUP.StudentID = STUDENT.StudentID;
```