OCR Computer Science AS Level

1.3.1 Databases

Concise Notes

Specification:

1.3.2 a)

- Relational Database
- Flat File
- Primary Keys, Foreign Keys, Secondary Keys
- Entity relationship modelling

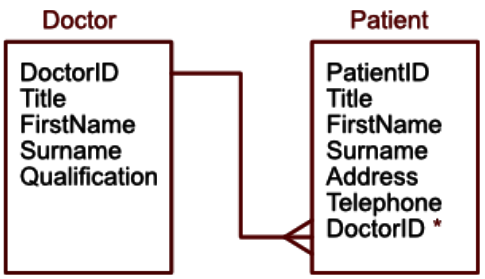
1.3.2 b)

- Methods of capturing, selecting, managing, and exchanging data

Relational Database

Relational Databases

- A relational database is one which uses different tables for different entities.
- An entity is an item of interest about which information is stored.
- The diagram on the right shows a relational database connecting two tables.



(1)

Flat File

- A flat file database consists of a single file.
- The flat file will most likely be based around a single entity and its attributes.
- Attributes are the categories about which data is collected.
- Flat files are typically written out in the following way:

Entity1(Attribute1, Attribute2, Attribute3 …)

- For the example in the table below, the description would be laid out as:

Car(CarID, Age, Price)

Car		
CarID	**Age**	**Price**
Car1	5 years	£1,500
Car2	2 years	£2,400

(2)

Primary Key

- The unique identifier which is different for each object added to the database.
- In example (2), the unique identifier is the CarID.
- In example (1), the primary key for the doctor table is DoctorID and the primary key for the patient table is PatientID.

Foreign Key

- A foreign key is the attribute which links two tables together.
- In example (1), DoctorID is the foriegn key, as it exists.

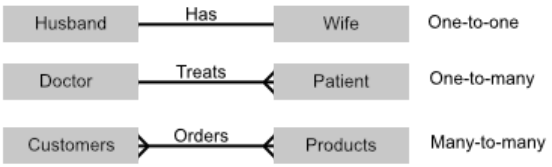
Secondary Key

- A secondary key is used to enable a database to be searched quickly
- In example (1), a secondary index (secondary key) can be set up on the Surname attribute.

- This will allow the table to be sorted on this attribute.

Entity Relationship Modelling

- One-to-one: Each entity can only be linked to one other entity.
- One-to-many: One table can be associated with many other tables.
- Many-to-many: One entity can be associated with many other entities and the same applies the other way round
- The image shows how this is represented diagrammatically.



Handling Data

Capturing Data

- Data needs to be input into the database and there are various ways of doing this.
- The chosen method is always dependent on the context.
- Data may need to be manually entered or scanned using methods such as Magnetic Ink Character Recognition (MICR) which is used with cheques.

Selecting and Managing Data

- Selecting the correct data is an important part of data preprocessing.
- This could involve only selecting data that fits a certain criteria.
- Collected data can be managed using SQL to sort, restructure and select certain sections.

Exchanging Data

- Exchanging data is the process of transferring the data that has been collected.
- One common example of this is EDI (Electronic Data Interchange).