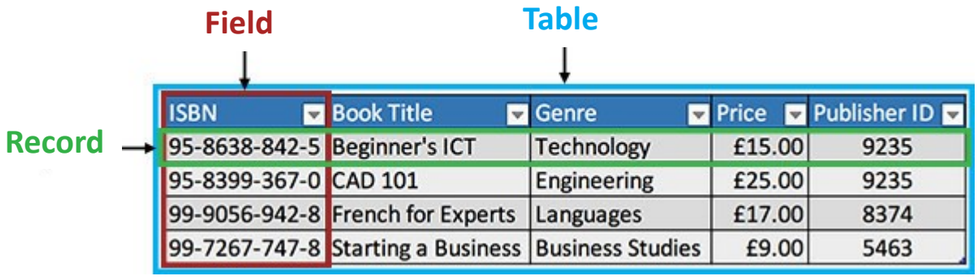
Pearson BTEC **Level 3 National Extended Certificate in Information Technology**

Unit 2: Creating Systems to Manage Information

Relational Database Terminology & Database Relationships

A database is a collection of data that is organised in a way that makes it easily accessed and maintained. We normally store data using a relational database. What this means is that we're going to store the data in more than one table and these tables will be linked together by certain fields.

Flat File Database	Flat-file databases are where all data is stored in a single table.
Relational Database	Relational databases are where the data is split across several tables.



Relational Database Structures

Table (relation)	Most of us know what a table is from using spreadsheet software. It is a grid made up of rows and columns that holds all of the data about something.
Field (attribute)	An individual piece of data in a record is known as a field, or attribute. In the previous example we said that each record for a book will store the ISBN, book title and price. Well these three things are all examples of fields. Fields appear as columns in a database table.
Record (tuple)	A row in a table is known as a record, or a tuple. A record holds all the data on a single item. For example, if we have a table to store book details for a shop, then each record is an individual book the shop sells, and it will store all the data on that individual book such as the ISBN, book title and price.

A relational database is made up of more than one table and these tables will be linked together by certain fields. Where these fields are linked, this is called a relationship. This allows us to organise our data in a much more efficient manner.

Relational Keys

Relationships between two tables are created through matching fields that appear in both tables. These fields are known as the relational keys and there are a few different kinds of key.

Primary Key	A key that has been selected to be the unique identifier of each tuple in the relation.
Foreign Key	Is a field of a table that is also a primary key in another table.
Composite Key	Is a combination of two fields that together can uniquely identify a record.

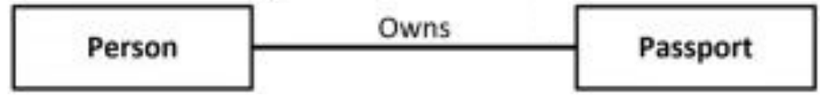
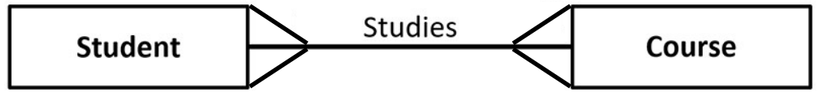
Integrity Constraints

Integrity constraints are used to ensure the accuracy and consistency of data in your relational database. The main two types of integrity constraints are:

Entity Integrity	This rule states that every table must have a primary key field and the data in that primary key field must be unique to each record.
Referential Integrity	This rule states that every foreign key value must match the primary key value of a record in another table, or must be null.

Entity Relationships

There are three different types of entity relationships that we can have. By far the most common form of entity relationship is the one-to-many relationship.

One-to-One Description	A single record of a table is related to a single record of another table. This could be the relationship between a person and their passport.
One-to-One Diagram	
One-to-Many Description	A single record of a table is related to more than one record in another table. In this relationship the foreign key would appear in the many side of the relationship. This could be the relationship between a customer and their orders.
One-to-Many Diagram	
Many-to-Many Description	More than one record of a table is related to more than one record of another table. This could be the relationship between students and their courses.
Many-to-Many Diagram	

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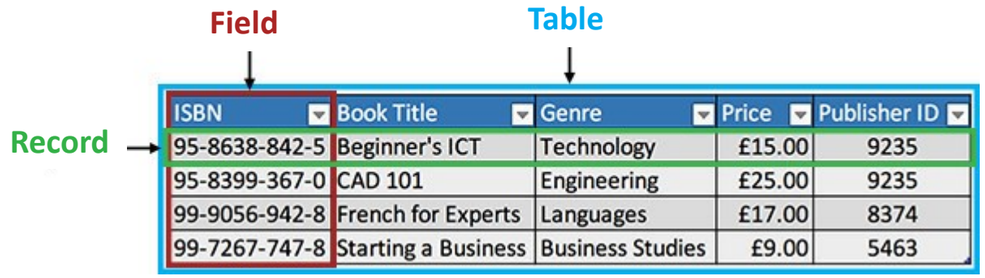
Relational Database	



Relational Database Structures

Table (relation)	
Field (attribute)	
Record (tuple)	

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Primary Key	
Foreign Key	
Composite Key	

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One-to-Many Description	
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Many-to-Many Diagram	