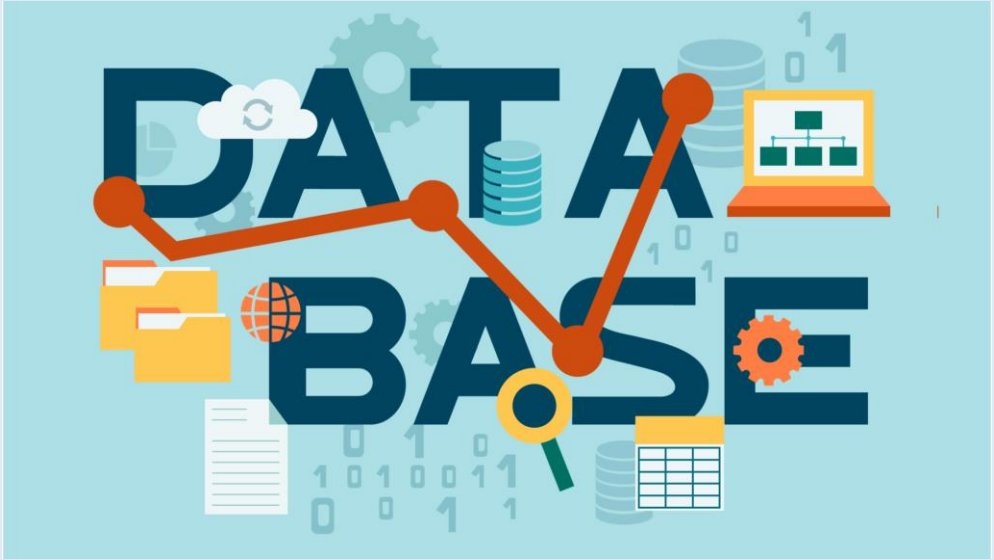
2.1 Databases Revision



Databases

Databases are a way of storing data in a logical and structured way.

This is a flat database – one table

Key field- unique

Field names – the headings

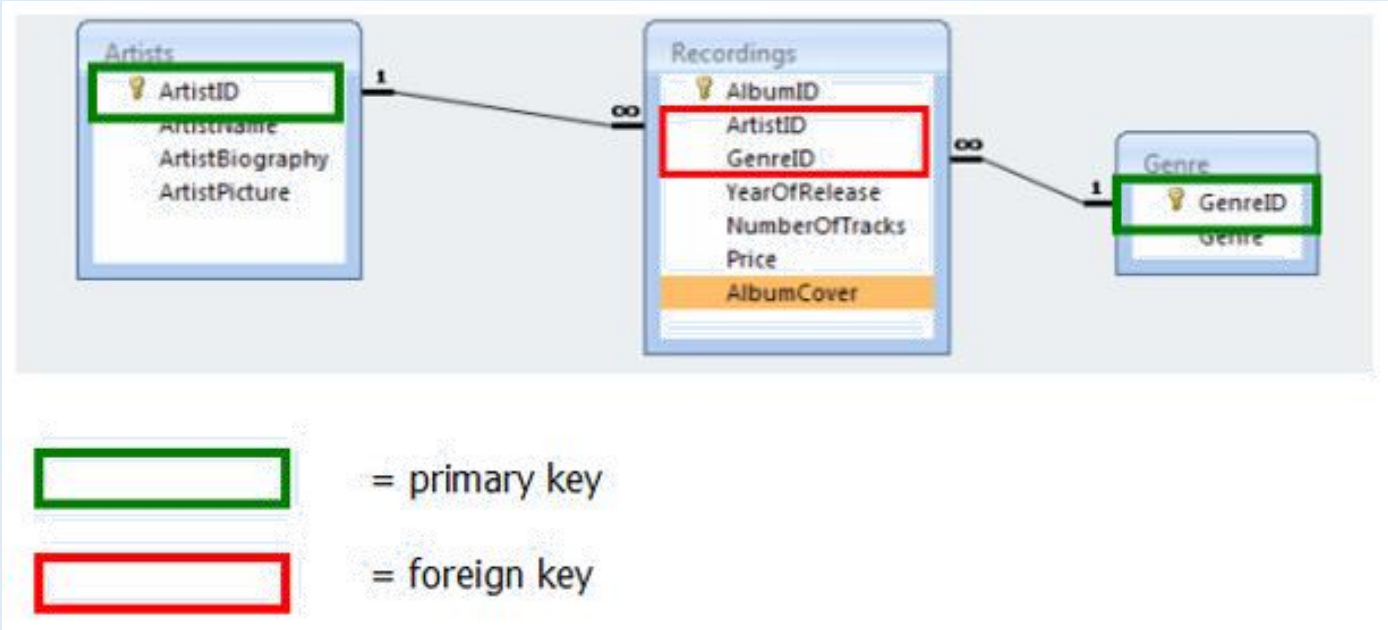
Pupil Id	Name	Date of Birth	Gender	Maths %	Welsh %
1134	Williams P	12/02/91	M	44	60
7679	Jones H	22/12/90	F	63	55
5532	Smith A	09/05/91	M	26	79
7823	Begum B	02/04/91	F	75	64
1298	Thomas A	25/09/90	M	88	73

Records – each row of data is known as a record.

Primary and Foreign Keys

Primary Key – A unique identifier. This keeps all of the records in the database unique.

Foreign Key – This is used to link tables together and create a relationship. It is a field in one table that is linked to the primary key in another table.



Advantages of Databases

- They are faster / easier to update
- Faster / easier to search
- Easier to read compared to handwriting on paper based data
- Save on physical storage space (no cabinet storage needed)
- Can use mail merge to create lots of documents quickly
- Easier to generate backups
- Easy to produce reports
- Validation to reduce data entry errors

Data Types

Alphanumeric or **Text** This allows you to type in text, numbers and symbols	Forename: James Surname: Smith Address: 73, High Street Postcode: CV34 5TR
Number This allows a whole number or a decimal number	15 21.35
Currency This automatically formats the data to have a £ or $ or Euro symbol in front of the data and also ensures there are two decimal places.	£5.75 $54.99
Date/Time This restricts data entry to 1-31 for day (28 or 30 in appropriate months) and 1-12 for month.	Long Date: 20 February 2006 Medium Date: 20-Feb-06 Short Date: 20/02/06
Autonumber This datatype will automatically increase by 1 as records are added to the database	Record 1: 1 Record 2: 2
Logical, Boolean, Yes/No The data is restricted to one of only two choices	Yes/No Male/Female

Data, Information and Knowledge

Data – raw facts and figures e.g. 24042013

Information – processed data that has meaning e.g. 24/04/2013 is my dog's birthday.

Knowledge – apply rules and make deductions from this information to produce knowledge e.g. 24/04/2013 is my dog's birthday, which means in 2023 my dog will turn 10 years old.

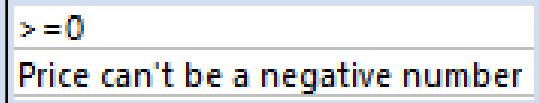
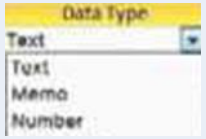
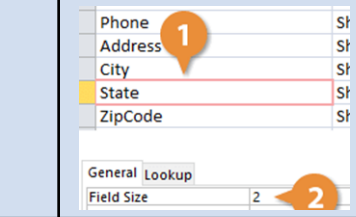
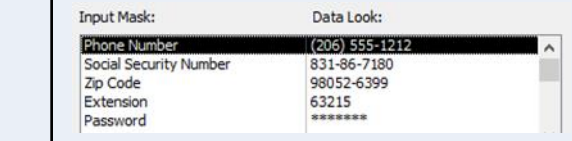
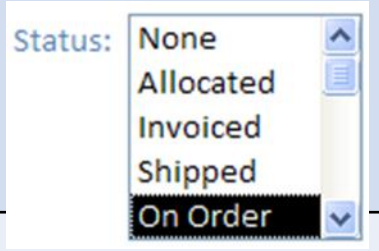
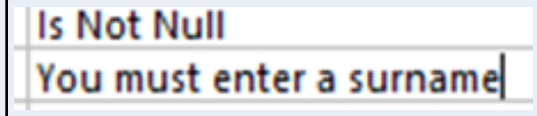
Encoding Data

This means to make the stored data shorter e.g. Male/Female becomes M/F.

Why do we need to encode data?

- Consistency of data
- Quicker to type as you are not typing in the entire word
- Save memory / storage space
- Less chance of typing in errors
- Easier to check codes using validation checks
- Faster to access data / search for data

Validation

Range Check A range check ensures that data is between an upper and lower acceptable value, within a certain range.	
Type Check A type check ensures that the data entered is of an expected type, e.g. a number or date.	
Length Check A length check ensures that the number of characters meets expectations, e.g. 8 character password.	
Format Check A format check ensures the data follows a set pattern (using an input mask).	
Drop Down Box A drop down box ensures the user can only choose a predefined option from a list, reducing the chances of spelling mistakes or unwanted responses.	
Presence Check A presence check ensures the user has at least entered something into the field, stopping them from accidentally leaving it empty.	

Search Criteria

To search a database, you need to specify the criteria to make sure you retrieve the correct results.

Every search consists of 3 parts:

Fieldname	Operator	Search Criteria
Make	=	Ford

This would look for all cars made by Ford.

Complex Search Example

This would look for all item that are **size large** that are to be **delivered** to the customer.

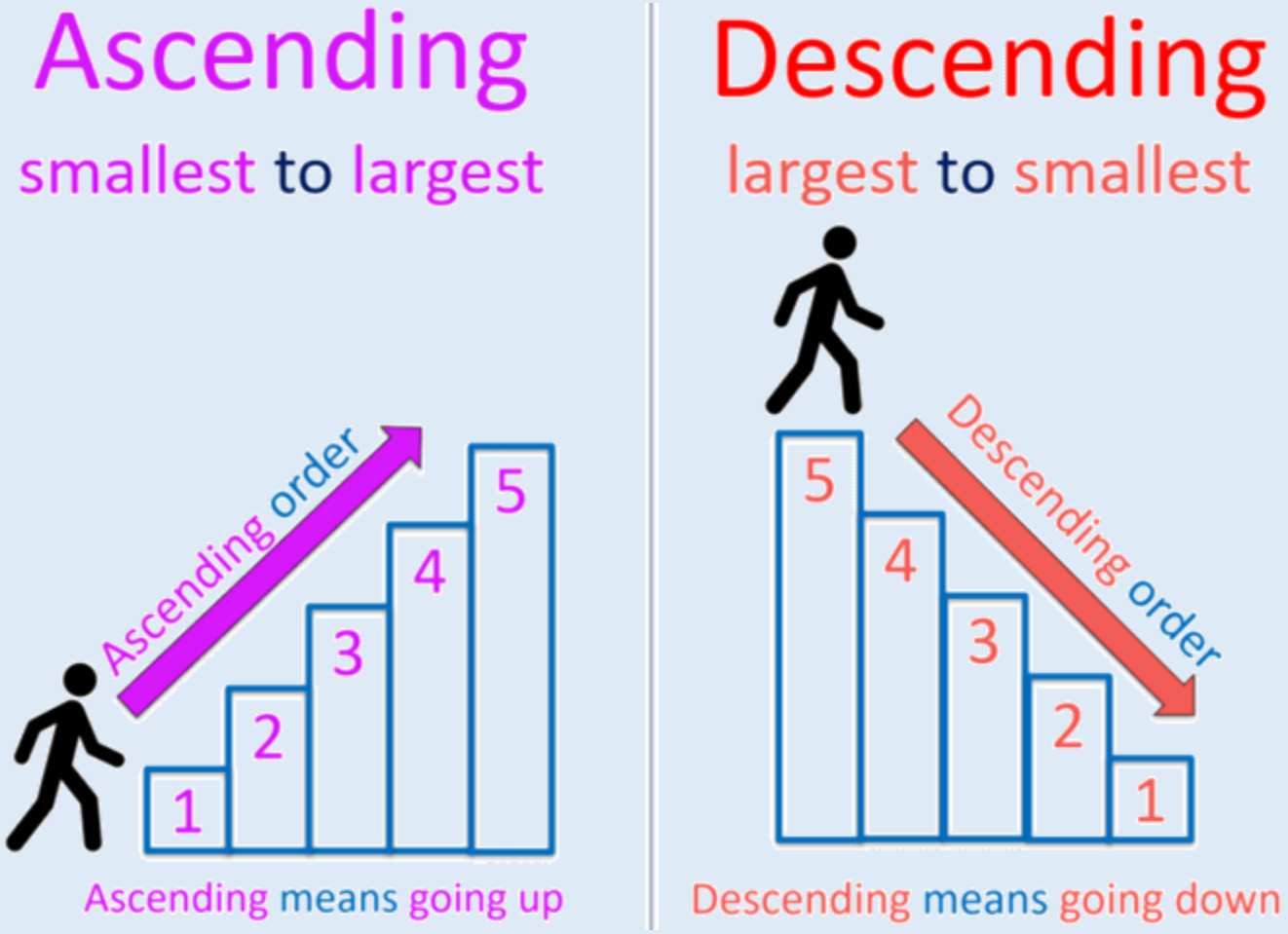
Fieldname	Operator	Search Criteria
Home Delivery	=	Yes

AND

Fieldname	Operator	Search Criteria
Size	=	Large

Sorting Data

You may want to sort you data in a particular order:



Ascending:
1-10 or A-Z

Descending:
10-1 or Z-A