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

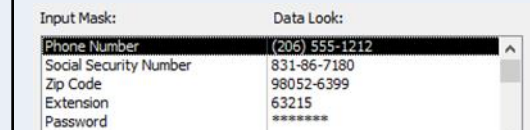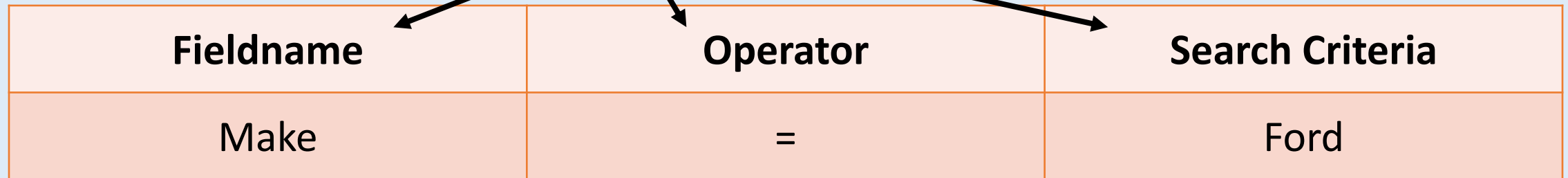|	
Range Check A range check ensures that data is between an upper and lower acceptable value, within a certain range.	>=0 Price can't be a negative number
Type Check A type check ensures that the data entered is of an expected type, e.g. a number or date.	Data Type Text Text Memo Number
Length Check A length check ensures that the number of characters meets expectations, e.g. 8 character password.	Phone Sh Address ① Sh City Sh State Sh ZipCode Sh General Lookup Field Size 2 ②
Format Check A format check ensures the data follows a set pattern (using an input mask).	Input Mask: Data Look: Phone Number (206) 555-1212 Social Security Number 831-86-7180 Zip Code 98052-6399 Extension 63215 Password *******
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.	Status: None Allocated Invoiced Shipped On Order
Presence Check A presence check ensures the user has at least entered something into the field, stopping them from accidentally leaving it empty.	Is Not Null You must enter a surname
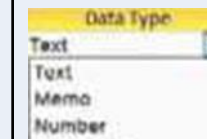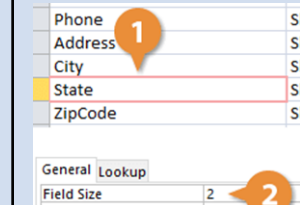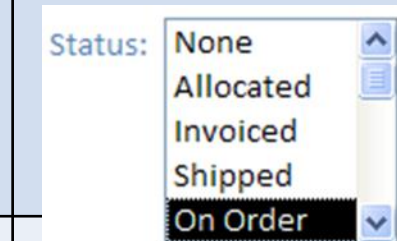
Search Criteria

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:
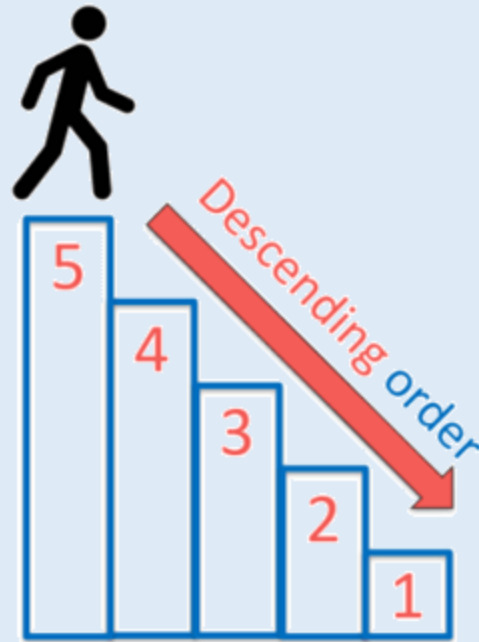
Ascending:
1-10 or A-Z

Descending:
10-1 or Z-A

Mail Merge

Mail merge is a word processing feature that allows users to personalise letters with names and addresses from a database.
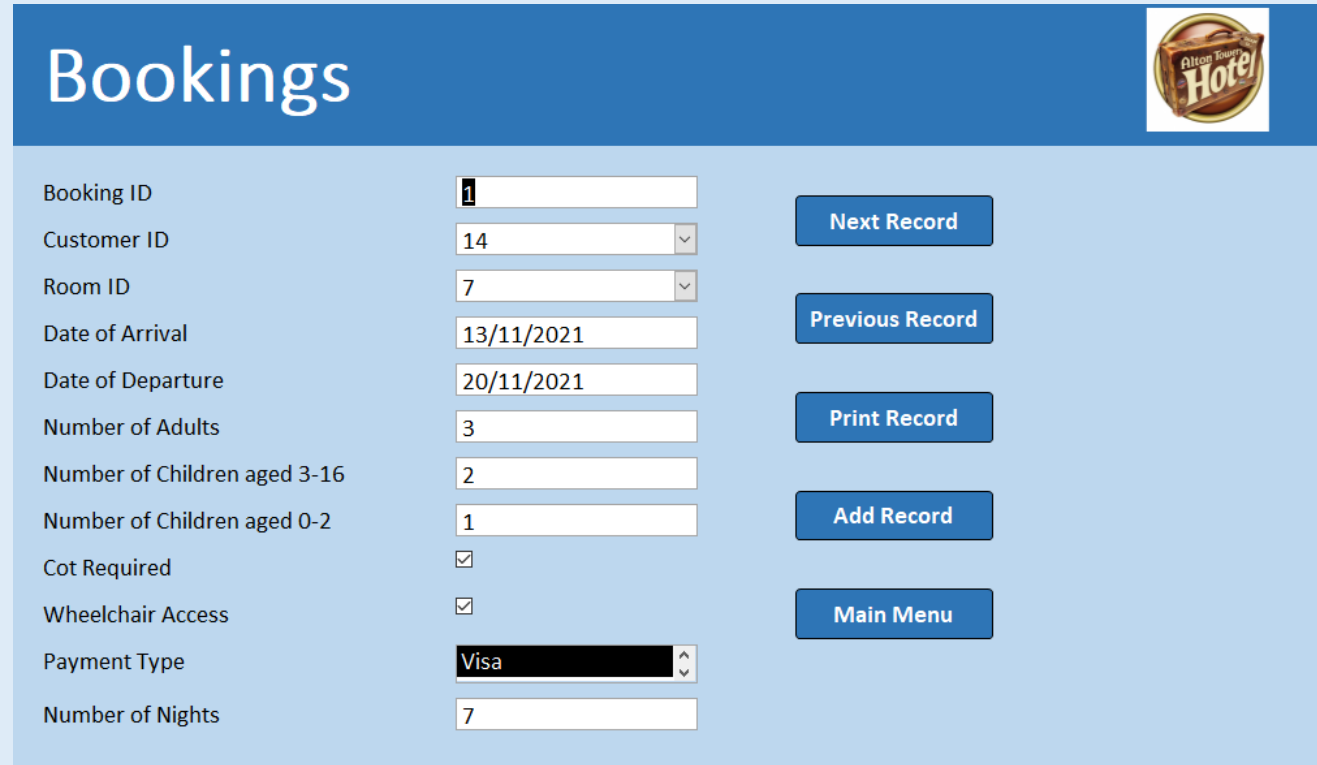
Advantages	Disadvantages
One standard letter can be written and sent to all customers without having to manually add each name and address.	Letters can lack the personal touch.
The letter can be personalised - it looks as though the letter has been written to the individual person.	The database that provides the information for the mail merge letter must be kept up to date if it is going to be useful.
It's a very fast way to produce hundreds of personalised letters.	

Forms

Forms make entering data into a database simple.

It allows the user to focus on entering one record at a time without distraction from other data.

It can make the user carry out other tasks such as printing specific records.