Unit 18 Database Design
Extended Diploma in ICT

DATA DICTIONARIES
Last time...

- Modelling
  - ERD
    - a top down method of modelling the real life business
- Normalisation
  - a bottom up method
    - Often based on existing system (possibly paper)
- may give different results
- the designer has to decide which ones to implement
## Normalisation

<table>
<thead>
<tr>
<th>0NF</th>
<th>1NF</th>
<th>2NF</th>
<th>3NF</th>
<th>Table names</th>
</tr>
</thead>
<tbody>
<tr>
<td>List all attributes</td>
<td>Non-repeating groups, compound keys</td>
<td>attributes depend entirely on the primary key</td>
<td>Filter out attributes that depend on another attribute and not the primary key</td>
<td>Meaningful table names for each group</td>
</tr>
<tr>
<td>No calculated fields</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You should have this for the vet scenario. You should also have an ERD for the vets. You should have differences between the two sets of tables.
Today

- Data dictionaries
- Assignment 2, P2
Before you can create the database you need to decide on the parameters of the attributes.

This is done in a data dictionary.
For each table, list the attributes and their characteristics in a table

<table>
<thead>
<tr>
<th>Table Name:</th>
<th>Dog</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attribute</strong></td>
<td><strong>Data type</strong></td>
</tr>
<tr>
<td>DogID</td>
<td>Autonumber</td>
</tr>
<tr>
<td>OwnerID</td>
<td>Number</td>
</tr>
<tr>
<td>DogName</td>
<td>Text</td>
</tr>
<tr>
<td>DogDOB</td>
<td>Date/time</td>
</tr>
<tr>
<td>Living</td>
<td>Yes/No</td>
</tr>
<tr>
<td>BreedCharacteristics</td>
<td>Memo</td>
</tr>
<tr>
<td>BreedPhoto</td>
<td>OLE</td>
</tr>
</tbody>
</table>
MS Access 2013 Data types

- **Short Text** (default)
  - Use for text or combinations of text and numbers, such as addresses, or for numbers that do not require calculations, such as phone numbers, part numbers, or postal codes.
  - Stores up to 255 characters. The FieldSize property controls the maximum number of characters that can be entered.

- **Long Text**
  - Use for lengthy text and numbers, such as notes or descriptions.
  - Stores up to 65,536 characters.

- **Number**
  - Use for data to be included in mathematical calculations, except calculations involving money (use Currency type).
  - Stores 1, 2, 4, or 8 bytes; stores 16 bytes for Replication ID (GUID). The FieldSize property defines the specific Number type.
MS Access 2013 Data types

- **Date/Time**
  - Use for dates and times.
  - Stores 8 bytes.

- **Currency**
  - Use for currency values and to prevent rounding off during calculations.
  - Stores 8 bytes.

- **AutoNumber**
  - Use for unique sequential (incrementing by 1) or random numbers that are automatically inserted when a record is added.
  - Stores 4 bytes.
MS Access 2013 Data types

- Yes/No
  - Use for data that can be only one of two possible values, such as Yes/No, True/False, On/Off. Null values are not allowed.
  - Stores 1 bit.

- OLE Object
  - Use for OLE objects (such as Microsoft Word documents, Microsoft Excel spreadsheets, pictures, sounds, or other binary data) that were created in other programs using the OLE protocol.
  - Stores up to 1 gigabyte (limited by disk space).

- Hyperlink
  - Use for hyperlinks. A hyperlink can be a UNC path or a URL.
  - Stores up to 64,000 characters.
MS Access 2013 Data types

- **Attachment**
  - Any supported type of file
  - images, spreadsheet files, documents, charts, and other types of supported files, much like attachments on e-mail messages. Can also view and edit attached files, depending on how the database designer sets up the Attachment field. Attachment fields provide greater flexibility than OLE Object fields, and they use storage space more efficiently because they don't create a bitmap image of the original file.

- **Lookup Wizard**
  - Creates a field that allows you to choose a value from another table or from a list of values by using a list box or combo box.
  - Sets the data type based on the values selected in the wizard.
Other parameters

- **Length**
  - can be modified below the maximum allowed for that data type

- **Default value**
  - Decide if a default value can be entered

- **Required**
  - Decide if an entry can be left blank or not

- **Key**
  - Identify the keys
  - **Primary Key**
    - Decide if autonumber is required
  - **Foreign Key**
    - Set to number if autonumber is used.
For each table, list the attributes and their characteristics in a table

<table>
<thead>
<tr>
<th>Table Name:</th>
<th>Dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
<td>Data type</td>
</tr>
<tr>
<td>DogID</td>
<td>Autonumber</td>
</tr>
<tr>
<td>OwnerID</td>
<td>Number</td>
</tr>
<tr>
<td>DogName</td>
<td>Text</td>
</tr>
<tr>
<td>DogDOB</td>
<td>Date/time</td>
</tr>
<tr>
<td>Living</td>
<td>Yes/No</td>
</tr>
<tr>
<td>BreedCharacteristics</td>
<td>Memo</td>
</tr>
<tr>
<td>BreedPhoto</td>
<td>OLE</td>
</tr>
</tbody>
</table>
Task – Part of A2 P2

- Decide which model you are going to use for the vet’s database
- Write an explanation (one page of A4) of how you arrived at your final choice of tables and attributes. This should clearly explain:
  - how you resolved any differences between the two models
  - Whether you added attributes that weren’t in the paper record and your reasons for doing so
- Create a data dictionary for each table in this design
- A description (in structured English/pseudocode) of how any calculations will be performed in preparing the bill
Use the paper records given, along with your understanding of how a veterinary surgery operates, to design a relational database to support the required functions. A minimum of 5 tables are required.

You must submit the following items:

1. An Entity Relationship diagram
2. Details of normalisation to third normal form
3. An explanation (one page of A4) of how you arrived at your final choice of tables and attributes. This should clearly explain:
   - how you resolved any differences between the two models
   - Whether you added attributes that weren’t in the paper record and your reasons for doing so
4. A data dictionary for all the tables in your design
5. A description (in structured English/pseudocode) of how any calculations will be performed in preparing the bill