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LECTURE 09:
INTRODUCTION TO MS ACCESS

Choose a job you love, and you will never have to work a day in your life.
Confucius

LEARNING OUTCOMES

After the completion of the lecture and mastering the lecture materials, students should be able to

1. explain Microsoft Access as a relational database management system.
2. explain structure of Microsoft Access
3. apply Microsoft Access (Table, Searching, Sorting, Indexing, Asdding, Editing and Deleting Records)

LECTURE OUTLINE

I. INTRODUCTION
1. Definition
2. Databse Use

II. MS ACCESS USE
1. Starting MS Access
2. The Navigation Pane
3. Using An Existing Table
4. Searching for a Particular Record
5. Sorting
6. Indexes
7. Adding, Editing and Deleting Records

I. INTRODUCTION

1. Definition
- **Microsoft Access** is an information management tool that helps store information for reference, reporting, and analysis.
- Microsoft Access is a relational database management system (which allows you to link together data stored in more than one table).
- A database is a computer program for storing information in an easily retrievable form.
- A database is used mainly to store text and numbers (for example, the Library catalogue , which includes the author, title, class number and accession number for each book).

- **Microsoft Access** helps you analyze large amounts of information, and manage related data more efficiently than **Microsoft** Excel or other spreadsheet applications.
- Most modern databases also allow the storage of other types of information such as dates, hyperlinks, pictures and sounds.

2. Database Use
- A database is also used to select information quickly and easily (for example, a list of the books written by a particular author or those on a certain subject).
- Finally, it may allow you to produce printed summaries (reports) of the information selected.
- When setting up a database, it is important to plan its use in advance.

- Among the things which should be considered, if the database to be used by other people in particular, are:
  - What information you will need to store.
  - What information you want to get out.
  - Who the data is intended for and how other users will use it.
  - Whether you want to restrict access to parts of the data to some users only.
  - Who is allowed to add or change data.

II. MS ACCESS USE

1. Starting MS Access

- First of all, create a folder (e.g. Excer), and put a database (**example2013.accdb**) to be used for exercise.
- Open Access 2013, it may start from the Windows **Start** button and choose **All Programs**, then select **Microsoft Office 2013** then **Access 2013**.
- On entering Access, **a screen shows available templates** which have been designed to help create databases.
  - Further templates can be searched at Office.com. These templates can be quite helpful for particular applications, but you nearly always have to tailor the database produced to your own requirements.

- You can also either create a new blank database (without help) or open an existing one.
- In this course you are going to use an existing database, to see how it is set up and how it can be used.
- Steps to follow to see **example2013** are:
  1. Click on **Open Other Files** (or simply press **<Ctrl o>**) then click on **Computer** and **[Browse]**.
  2. An *Open* window appears –click on **Computer** then *double click* on **Data (D:)** to **[Open]** it.
  3. *Double click* on the folder called **Training** to open it.
  4. Click on **example2013.accdb** from the list which appears and press **<Enter>** or click on **[Open]**.
- *Note: The data of exercise (example2013) does not refer to real people.* You may need to **[Enable Content]** to use it.

2. The Navigation Pane

- In the next screen, a *Navigation Pane* appears on the left. This controls navigation within a particular database.
- A database is made up of several *objects*, grouped into a single file.
- This database has been set up to show *All Access Objects* which currently exist in this database, but there are other types of object as well which do not currently appear.
- The full list is:
    - **Tables** - hold the raw data.
    - **Queries** - extract part of the raw data to produce *dynasets* - dynamic sets of data which can change each time the query is run (to reflect any changes to the data in the tables).

- **Forms** - user-friendly layouts to display data on the screen (either in a table or from a query)
- **Reports** - output files, ready for printing.
- **Pages** - for creating/editing WWW pages.
- **Macros** - lists of commands to perform particular functions.
- **Modules** - programs which expert users write in a programming language called Access Basic to perform tailor-made functions not generally available.

● The objects are accessed from the *Navigation Pane*. As you use the different objects, the tabs on the *Ribbon* change appropriately.

1. Click on a double arrow on the right to show or hide the objects in a particular group
2. Click on the single arrow at the top of the *Navigation Pane* to view further display options.

3. Using An Existing Table

● The table, named *students*, contains data relating to imaginary students in a fictitious department in the University, but it could equally be members of a club or just information about your friends and relatives.

● Begin by investigating the table with the following command:

1. Select the **students** table then press **<Enter>** (or *double click* with the mouse) to open it.

● A new pane opens on the right showing the data set out in a table.

- This method of display (known as *Datasheet View*) shows the data in columns and rows, similar to a spreadsheet.

● There are a number of entries (*records*), one for each student, which each take up one line (row) of the table.

- For each student, various items of data are recorded in columns - each column contains one variable (or *field*).

- On the top of the table is a tab, which provides easy access when you have more than one object open. named *students.*

- Immediately below the data is a *grey horizontal bar*, which shows you are positioned at Record 1 (of 390).

Record: I◄ ◄ [1 of 390] ► ►I ►▦
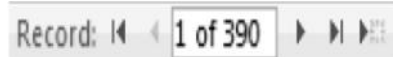
- The *current record* has a slightly darker background, while the column on the far left is yellow-orange (the *current field* has a coloured border).

- The indicator can be moved down to the next record (2 in this case) by clicking on the right arrow on the grey bar.

- The next button to the right takes you to the end of the table.
  - click on this and you should be at Record 390.
  - Matching buttons on the left take you back a single record and back to Record 1

- The arrow keys on the keyboard can be used to move the display up and down.
  - The scroll bar down the right edge of the table window moves the display up and down.
  - Another scroll bar is provided at the foot of the window for moving to the left and right when the records extend over more than one screen.
  - To move from field to field across a record, use the ***<right arrow>*** and ***<left arrow>*** keys or **<Tab>** and **<Shift Tab>**.
  - The **<End>** key takes you to the last field, the **<Home>** key to the first.

- The **\<Page Up\>** and **\<Page Down\>** take you up and down a screen, while **\<Ctrl Home\>** and **\<Ctrl End\>** take you to the first field of the top record and final field of the last record, respectively.

- To see exactly what each record contains and how it has been set up:

  2. Click on the **[View]** button (first on the **HOME** tab) – a *TABLE TOOLS DESIGN* tab is added to the *Ribbon.*

- The *Table Design* pane lists the field names, indicates their data types and also shows the *field properties*. The screen appears as below:
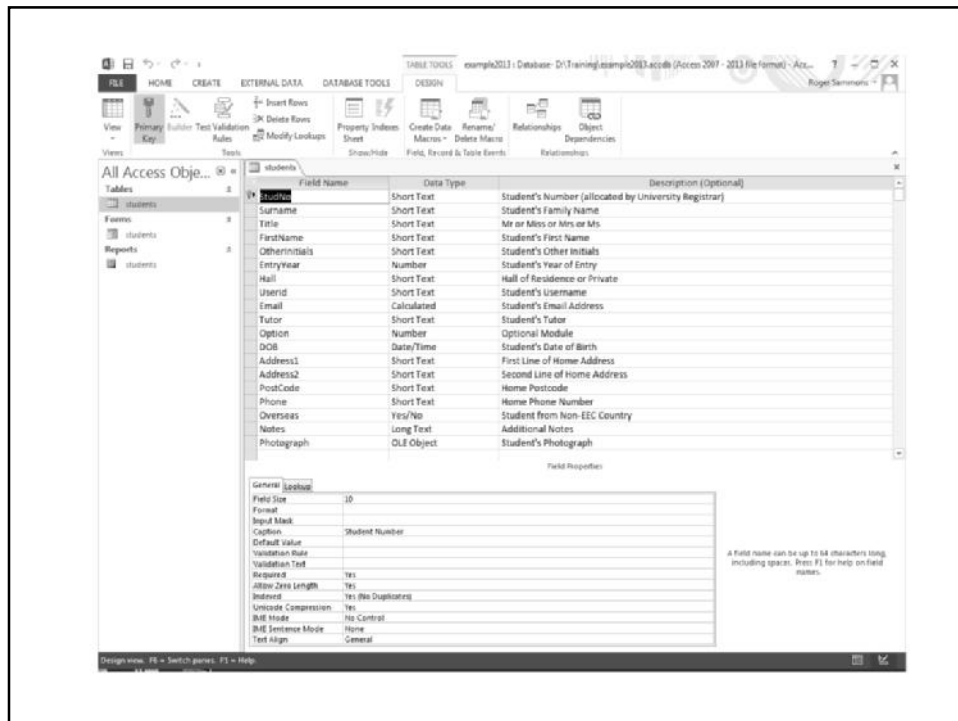
- The fields (and properties) are as follows:
  - **StudNo**: A *short text* field containing each student's personal id, as allocated by the University Registrar's Office.
  - Short text fields are the commonest type of fields and can be used to store any characters (letters, punctuation, numbers etc). Numbers should be stored as *text* if not being used in calculations.
  - This field is set up to hold up to 10 characters and a *Caption* is used to expand the field name. This number uniquely identifies each student - the *Required* property has been set to **Yes** and *Indexed* is set to **Yes (No Duplicates)**.
  - This field has also been used to set up a *Primary Key*.

  3. Press **<down arrow>** to move to the next field (then repeat this for each field): M
     - **Surname**: A *short text* field containing the Family Name of each student. This field is required, can hold up to 25 characters and is *Indexed* as **Yes (Duplicates OK).**

  - **Surname**: A *short text* field containing the Family Name of each student. This field is required, can hold up to 25 characters and is *Indexed* as **Yes (Duplicates OK).**
  - **Title**: Another *short text* field, but this is for up to 4 characters. The possible values (Mr/Mrs/Miss/Ms) and can set up a *Validation Rule* to check that the data entered is correct - if it is not, the *Validation Text* is displayed. A *Default Value* (Mr) has also been set.
  - **FirstName**: Another *short text* field for student's first name - up to 20 characters.
  - **OtherInitials**: A *short text* field for any other initials - up to 6 characters.
  - **EntryYear**: A *number* field recording the student's year of entry. Numbers can be stored using different field sizes; here, an *integer* is used - see the Appendix for a full explanation. This could also be stored as a *text* or *date/time* field, depending on how it is to be used. The *Default Value* is set to the current year using built-in *Functions*.

- **EntryYear**: A *number* field recording the student's year of entry. Numbers can be stored using different field sizes; here, an *integer* is used - see the Appendix for a full explanation. This could also be stored as a *text* or *date/time* field, depending on how it is to be used. The *Default Value* is set to the current year using built-in *Functions.*
- **Hall**: Another *short text* field. Here the values are known (there are only certain Halls of Residence) so a *Validation Rule* has been set - up to 15 characters. A *Default Value* (Private) has also been set**.**
- **Userid**: This is the student's computer username, which can also be used for the student's email address (see next field) - a *short text* field for up to 8 characters**.**
- **Email:** The student's email address, calculated from the *Userid* – you'll learn more about this later.
- **Tutor**: The student's tutor - again a *short text* field for up to 20 characters**.**

- **Option**: A *number* field which points towards different optional course modules the student can study. As the number of options is small (and always +ve), the field is stored as a *byte.* A slightly different *Validation Rule* is used to check the data entered**.**
- **DOB**: The data type here is *Date/Time,* which has been set up in *Medium Date* format. Note that a *Caption* is used to expand the field name.
- **Address1**: First line of the student's home address - a *short text* field storing up to 50 characters**.**
- **Address2**: Second line of the student's home address - a *short text* field storing up to 20 characters**.**
- **PostCode**: The student's home post code - a *short text* string storing up to 10 characters.
- **Phone**: The student's home telephone number - note that even though this is a number it is stored as *short text* (you won't be doing any mathematical calculations with it!)**.**

- **Phone**: The student's home telephone number - note that even though this is a number it is stored as *short text* (you won't be doing any mathematical calculations with it!)**.**
- **Overseas**: A *Yes/No* (or logical) field storing whether the student is from an EEC country or not. The *Default Value* is set to *No.*
- **Notes**: For any other pieces of information - for longer pieces of text, a *Long Text* data type is used**.**
- **Photograph**: Digital data (e.g. a passport photograph) are stored as *OLE Objects.*

- Other data types exist which are not included here, namely: *currency*, *autonumber*, *hyperlink* and *attachment* (see the Appendix for further details).
- To close the *Table Design* pane and return to the top of the datasheet:

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4. Click again on the **[View]** button - note how the icon changes as you move between *Design* and *Datasheet* view. m

4. Searching for a Particular Record

- To search for a particular record (i.e. down a field), you should first move to the field you want to search:
  1. Press **<Tab>** to move to the *Surname* field.
  2. Click on the **[Find]** button on the *HOME* tab (or press **<Ctrl f>**) and a *Find and Replace* window appears

  Find:

  3. The cursor is already positioned in the *Find What:* box - type in **smith.**
  4. Press **<Enter>** for [**Find Next**] and the search should be carried out.

4. Press **<Enter>** for [**Find Next**] and the search should be carried out.

5. Press **<Enter>** again and another *Smith* will be found

6. Keep pressing **<Enter>** until you get the message that the search item is not found.

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5. Sorting

- The records are shown in the order that they were first entered into the database - as the data came from the Registrar's Office, it is in *Student Number* order.

- For this reason, it wouldn't have been easy to search for *Smith* simply by scrolling through the records (and imagine trying to find a book in the Library if they were all listed by their date of purchase!).

- If the data is sorted, however, then you can scroll through the records to search for a particular one.

- To sort any field into alphabetical/numeric order, a quick sort facility is provided.

- First, you have to move to the column on which the sort is to be based.
  1. Press **<Tab>** to move to the *Surname* field.
  2. Click on **[Ascending]** in the *Sort & Filter* group on the **HOME** tab of the *Ribbon*.

- The names of the students are now in alphabetical order.
  - Note that only the screen display is sorted - the records are still stored in the order in which they were typed, and they always will be.

  3. Use the **[Remove Sort]** button to reset the data to its original unsorted order.

- To keep the new display order for the next time, save the changes to its design, and try this next:
  1. Move to the field you want sorted (e.g. *Surname*).

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  2. Click on **[Ascending]** (or **[Descending]** if you want the data in reverse order).
  3. Close the table by clicking on its **[Close]** button (immediately above the table).
  4. Save the changes to the table design when asked - press **<Enter>** or click on **[Yes].**
  5. Now press **<Enter>** again to reopen the table - you should find it in the new order.

  BEWARE: it's very easy to accidentally save unwanted changes to the table design. Double check you want to save them **M**

6. Indexes

- An index can be likened to an index in a book (this adds just a few extra pages but is invaluable if you want to look up something).

- In a database, it is used to speed up searching, sorting and grouping data - one should be set on any field used frequently in these ways.
  - Access records the sort order in a hidden object so that it doesn't need to repeat the sort each time.
  - Indexes also perform a second useful function in that they can be used to guard against duplicate data entry.
- These are always used when a field is set up as a *Primary Key*. Try setting up an index on another field:
  1. Click on the **[View]** button to switch back to *Design View*.
  2. Note that the *StudNo* field already has an index - set to *Yes (No Duplicates)*. As this is used as the *Primary Key*, it must have this setting.
- The *Surname* field has an index of **Yes (Duplicates OK)**. This field is frequently used for sorting and duplicate values are allowed - as in the case of *Smith*.

- Try setting an index on *Hall* - another field likely to be used in sorting/selecting:
  3. Click on the *Hall* field, look at the *Field Properties* at the bottom of the screen, and, using the *list arrow*, set *Indexed* to **Yes (Duplicates OK).**
  4. Next click on the *Userid* field and note the index here is set to **Yes (No Duplicates)**. The values in this field should be unique and the index will ensure this.
  5. Click on the **[View]** button again to switch back to *Datasheet View* - when asked, press **<Enter>** or click on **[Yes]** to save the changes to the design of the table.

7. Adding, Editing and Deleting Records

- Whenever any changes (additions, deletions or edits) are made to a table, it is the original data file that are altered.

- Unlike most other applications, a database does not make a working copy of the file first.
- For this reason, it is essential to keep a back-up copy of your file (to which you can always return), just in case you make mistakes when carrying out amendments.
- To add a new record to the database, use the **[New]** button (on the grey bar at the bottom or in the *Records* group on the **Home** tab of the *Ribbon*).
- New records are always added at the end of the existing data.
- As soon as typing is started, Access creates a new empty record (marked with an asterisk), while the current record indicator changes from an arrow to a pencil. Try the following steps:

- As soon as typing is started, Access creates a new empty record (marked with an asterisk), while the current record indicator changes from an arrow to a pencil. Try the following steps:
  1. Click on the **[New]** button (or press **<Ctrl +>**) - you should now be on Record 391.
  2. Type in a number for the *StudNo* (type in your own or just **99**) then press **<Enter>** (or ***<right arrow>*** or **<Tab>**) to move to *Surname*.
  3. Type in your own surname then move to *Title* (press **<Tab>**, **<Enter>** or ***<right arrow>***).
  4. Repeat step **3** until you have filled out most of the record (at least the columns up to *userid*).

- Note that some fields already have a default value. To change a value in a field you simply type in a new one. Note also that some fields (e.g. *Hall* and *Option*) can only accept certain values, others (e.g. *StudNo*, *Surname* and *FirstName*) *cannot* be left blank. Calculated fields (e.g. as *email*) cannot be edited
- The *Photograph* field can hold a picture. The best way to add one is via the *Clipboard* (i.e. **Copy** and **Paste**).
- If you *right click* on the field and choose **Insert Object...** then it may appear as an icon which you then have to *double click* to open. As pictures cannot be displayed in tables anyway, don't try filling out this field here.

http://leavingbio.net/TheStructureandFunctionsofFlowers%5B1%5D.htm