UNIVERSITÀ DEGLI STUDI DI BERGAMO
Dipartimento di Ingegneria Gestionale, dell'Informazione e della Produzione

22059 – APPLIED TOPICS IN MANAGEMENT ENGINEERING

Excel, Access and Matlab

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ACCESS

What is MS Access?

- It is a Database Management System (DBMS).
- It is a "relational" database application. This means that you can relate complex sets of data.

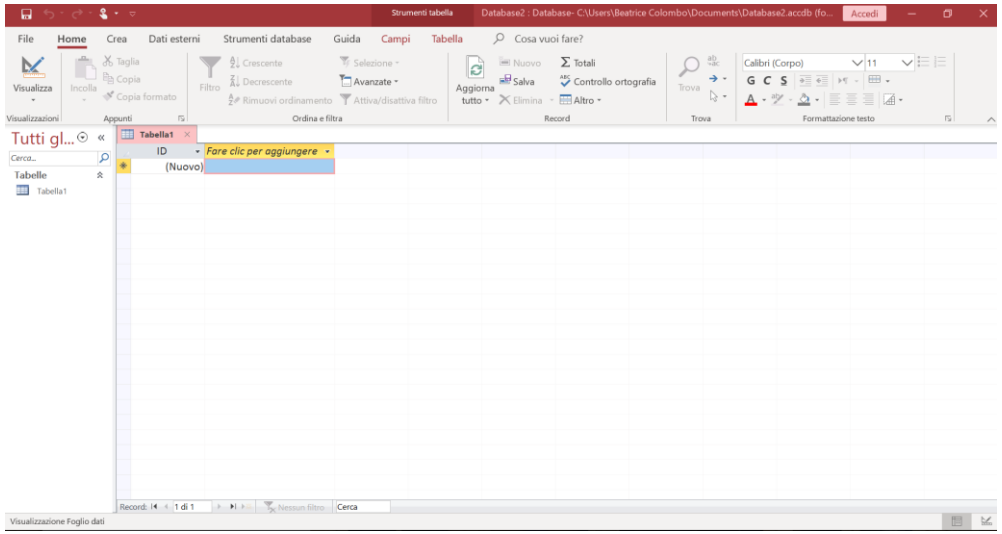

Fig.1: Access interface

ACCESS

What is MS Access?

- It allows you to store, organize, and manage large volumes of data (up to 2GB).
- Access is a conservative database. This means that every modification that you perform is saved.

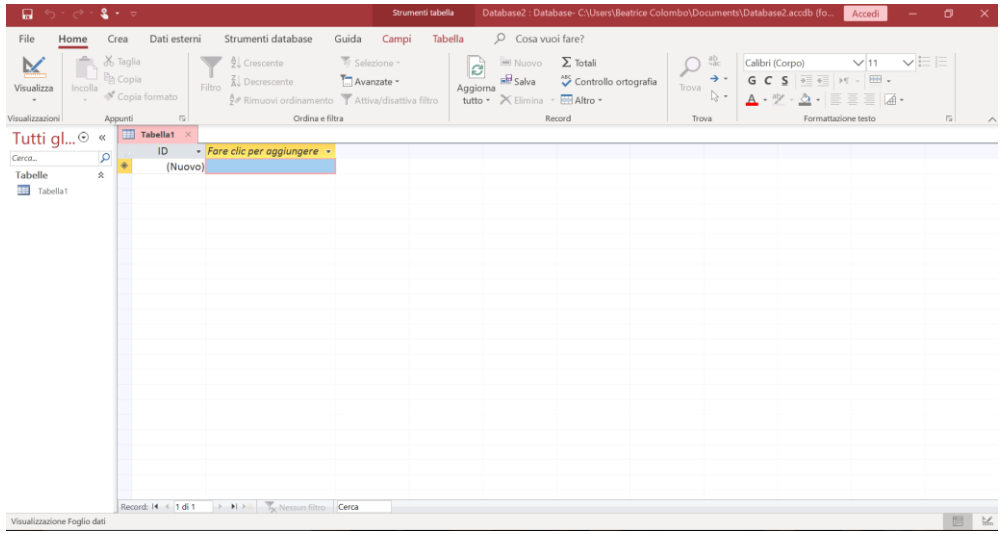

Fig.1: Access interface

AGENDA

Lecture VII

- IMPORTING DATA
  - How to import data from an Excel file
- TABLES
  - How to create Tables
  - Data Types
- FURTHER MATERIAL

IMPORTING DATA

- Importing and exporting data is easy.
- You may import data from several sources such as:
  - Excel spreadsheet
  - Access database
  - Text file
  - XML file

  and so on

IMPORTING DATA

- You may import into:
  - A new database → a new table is created in that blank database.
  - An existing database → Access creates a copy of the data in a new or existing table without altering the source file. Before starting the import operation you may choose whether you want to store in a new or an existing table.
- Once the data has been imported, you may create queries, reports etc.

How to import data from an Excel file

1. Click on External Data Tab.

2. Select Excel from “Import & Link” group.

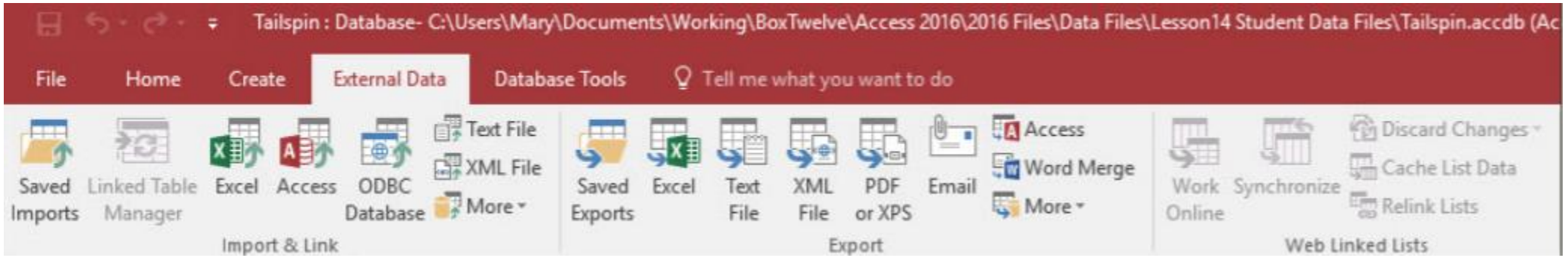

Fig.2: External Data Tab

How to import data from an Excel file

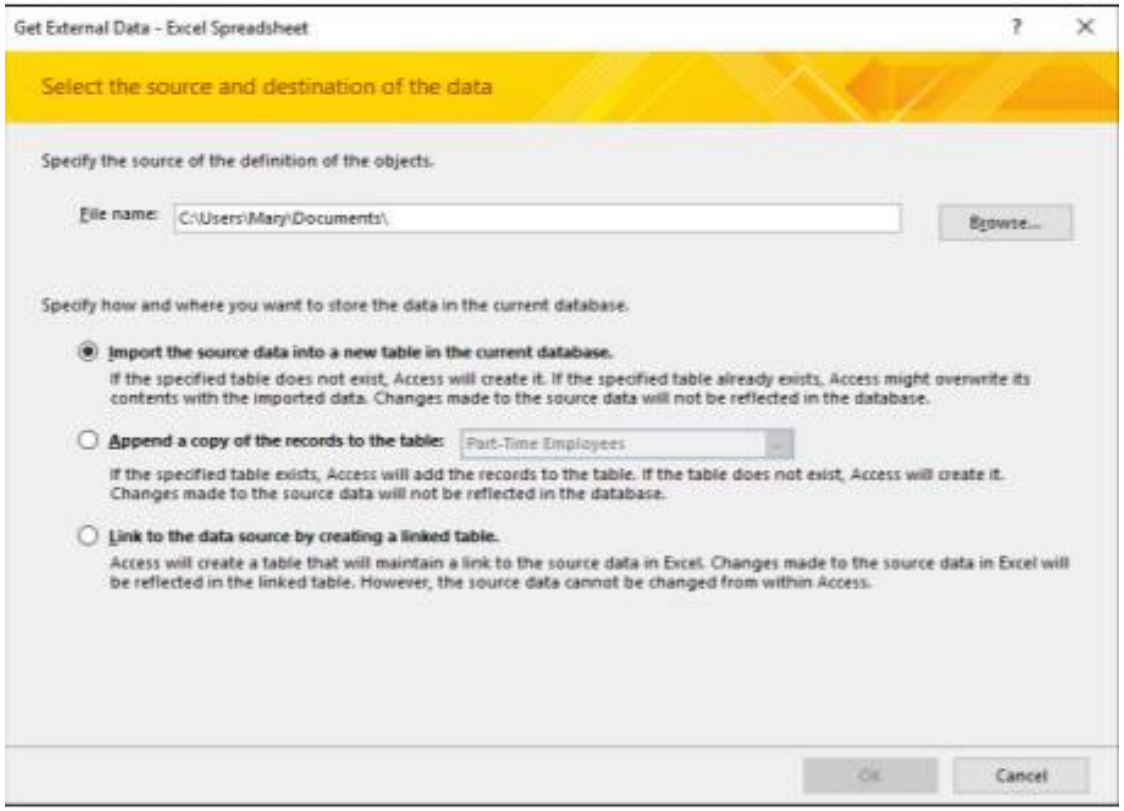

Fig.3: Get External Data window

3. The *Get External Data – Excel Spreadsheet* window will appear.
4. Click on Browse.
5. The *File Explorer* will appear. Select the Excel file to import and click Open.
6. Select the “Import the source data into a new table in the current database” option and then click OK.

How to import data from an Excel file

7. The *Import Spreadsheet Wizard* will appear.
8. Select Next.

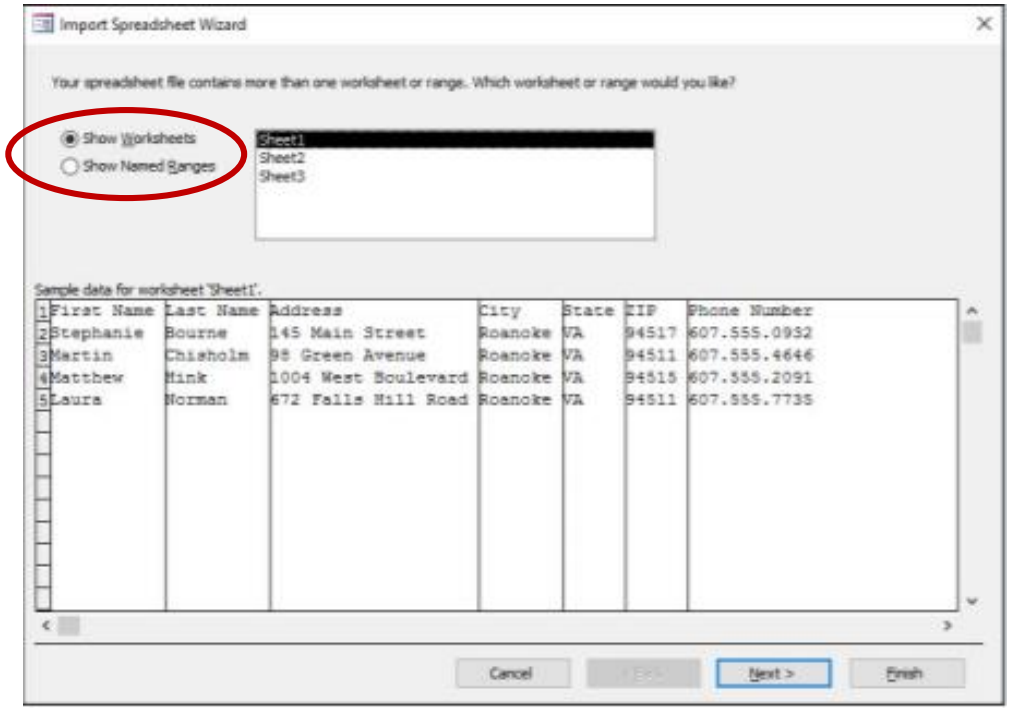

Fig.4: Import Spreadsheet Wizard, first screen

NB.

You can import only one Excel worksheet at a time during an import operation.
To import data from multiple worksheets, repeat the import operation for each worksheet.

How to import data from an Excel file

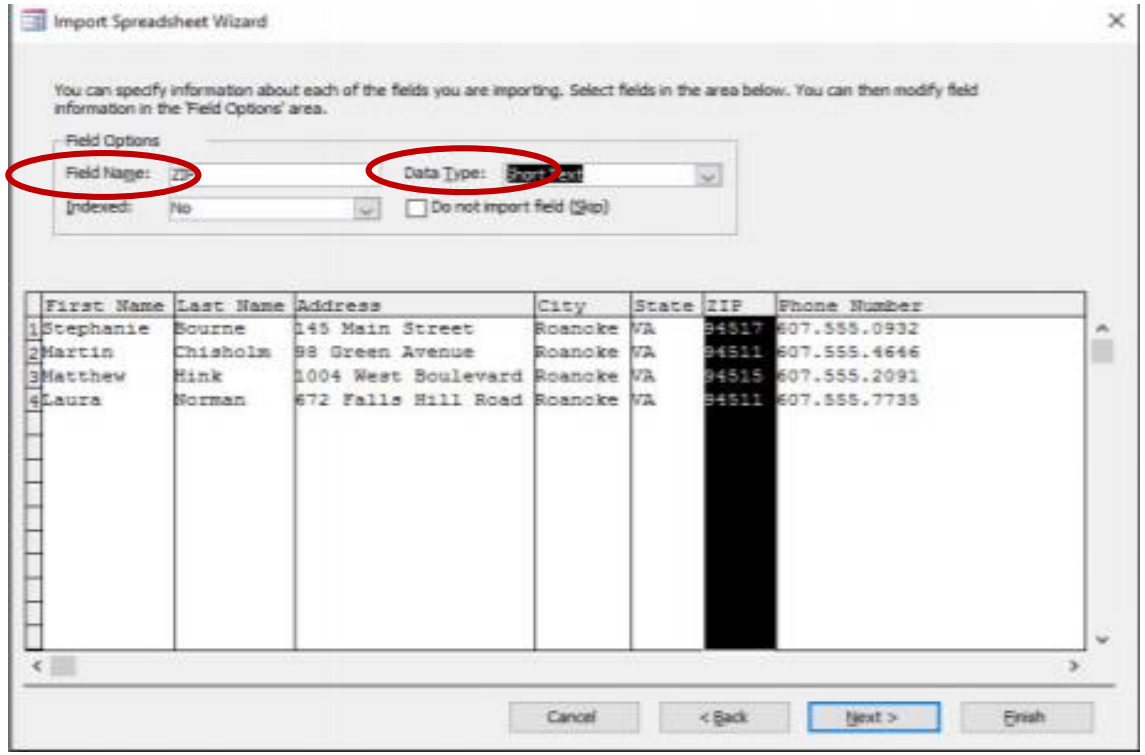

Fig.5: Change field properties screen

7. Check the box next to *First Row Contains Column Headings.*
8. Click Next.
9. You can select the different columns and adjust the *Field Name* and *Data Type* for the database.
10. When you have finished, click Next.

How to import data from an Excel file

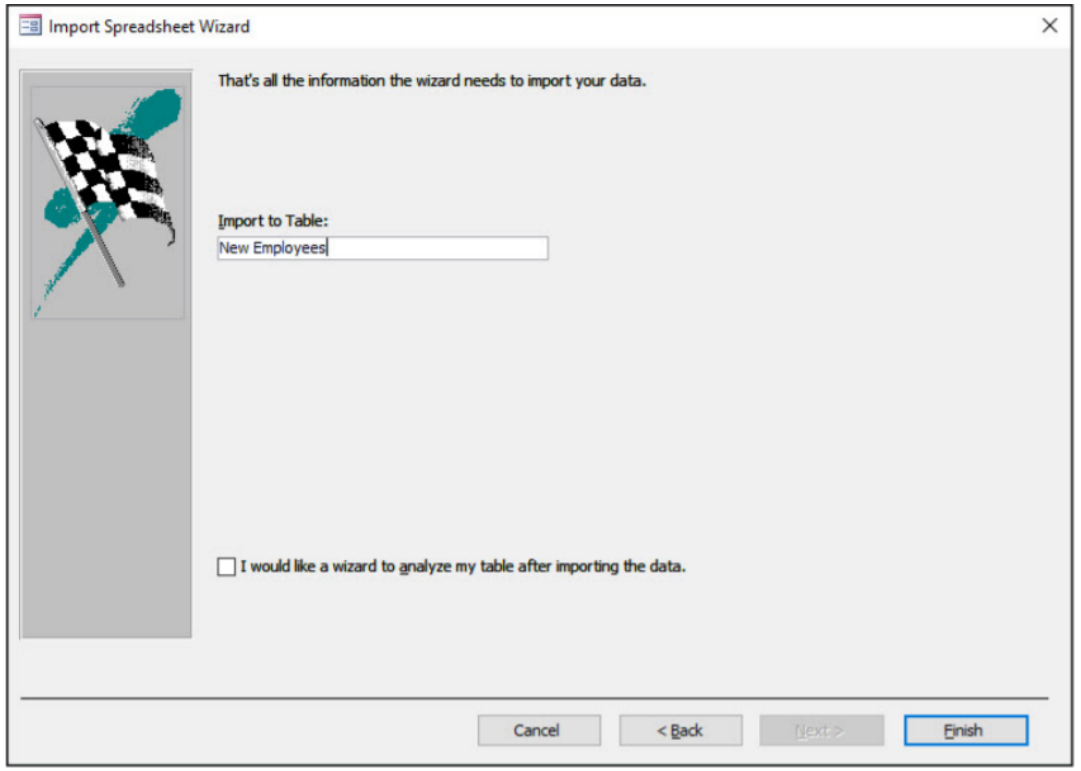

Fig.6: Import Spreadsheet Wizard, final screen

11. If you need, you can choose the primary key.
12. Click Next.
13. Enter a name for the new table in the Import to Table field.

How to import data from an Excel file

14. Click Finish.
15. The *Save Import Steps* window will appear. Select Save Import Steps.
16. Click Close.
17. To open the new table with imported data, double-click the New Employees: Table, in the Navigation Pane.

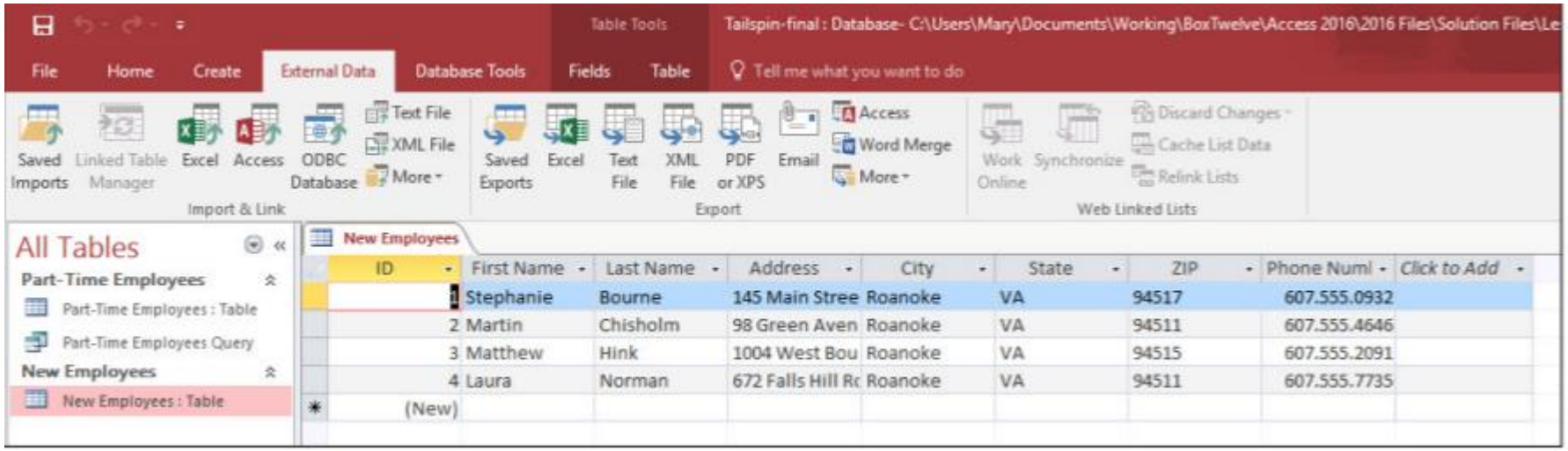

Fig.7: New table with imported data

TABLES

- Tables are the cornerstone on which all databases are based, so it is fundamental to understand how they are made and how they work.
- A table is composed by rows that are commonly called *records or entities*.
- Each record is composed by a predefined number of segments, called *fields*.
- To distinguish the fields from each other you give them a name. These names constitute the heading of the table which is not a row of the table.
- In the fields you write the data related to the attributes of the entity you are referring to.

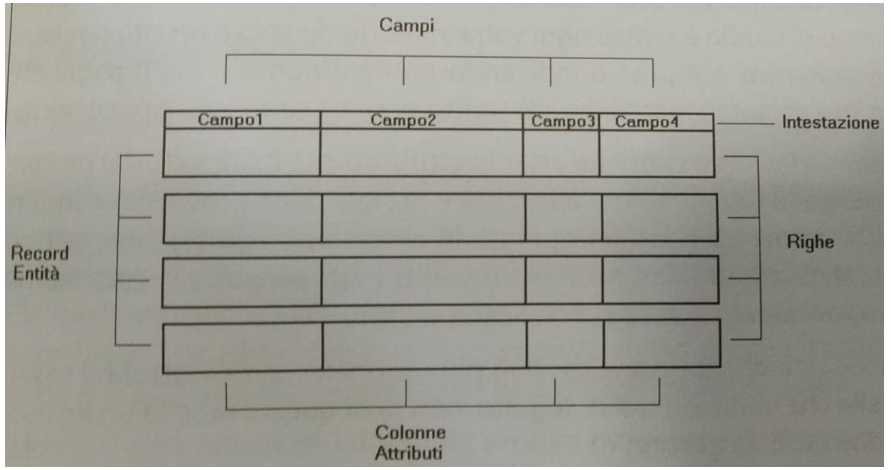

Fig.8: Table structure

How to create Tables

- You may create a new table in several ways:
  - Manual input
  - Table Design
  - Copy and Paste
  - Application Parts

- We will focus on the first two methodologies.

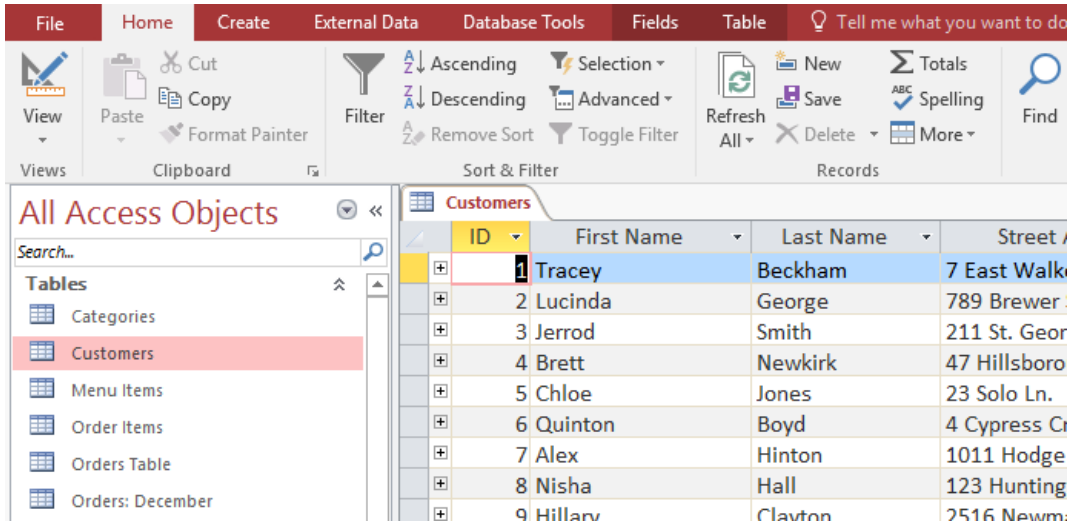

Fig.9: Table example in Access

TABLES - How to create Tables

Manual input

1. Click on Create Tab.
2. Select Table in “Tables” group.

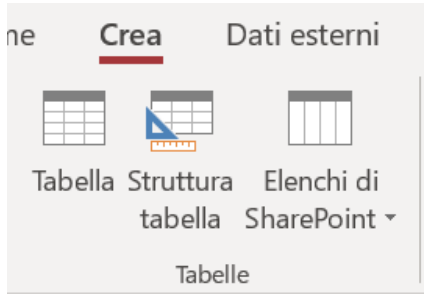

Fig.10: Tables group

3. The window in Fig. 11 will appear.

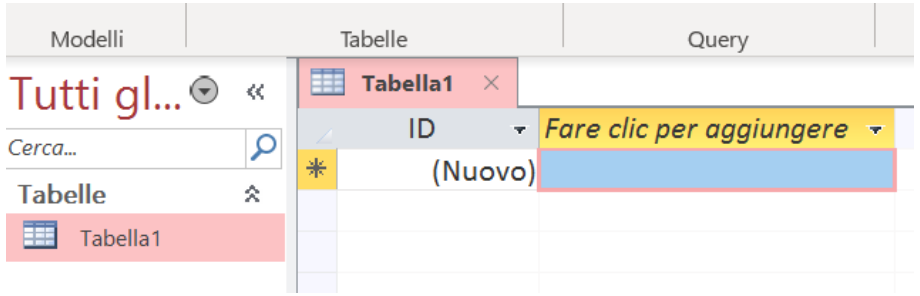

Fig.11: Application window

4. The ID field has already been created. If you want to rename it to suit your conditions, you have to select ID then click on Fields Tab and select Name & Caption in the “Properties” group.

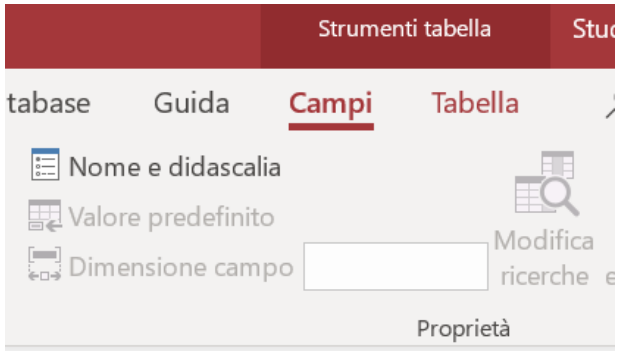

Fig.12: Name & Caption in Properties group

Manual input

5. The Enter Field Properties will appear. Change the name of this field. If you want enter the other optional information and click OK.
6. You can add more fields by clicking on click to add.
7. Choose Short Text as the field. When you choose short text, Access will then highlight that field name automatically and all you have to do is type the field name.

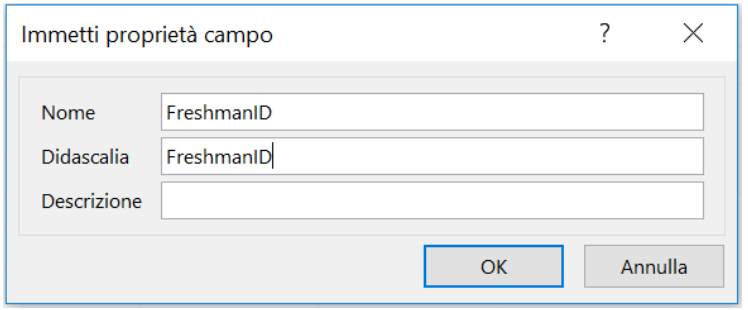

Fig.13: Enter Field Properties window

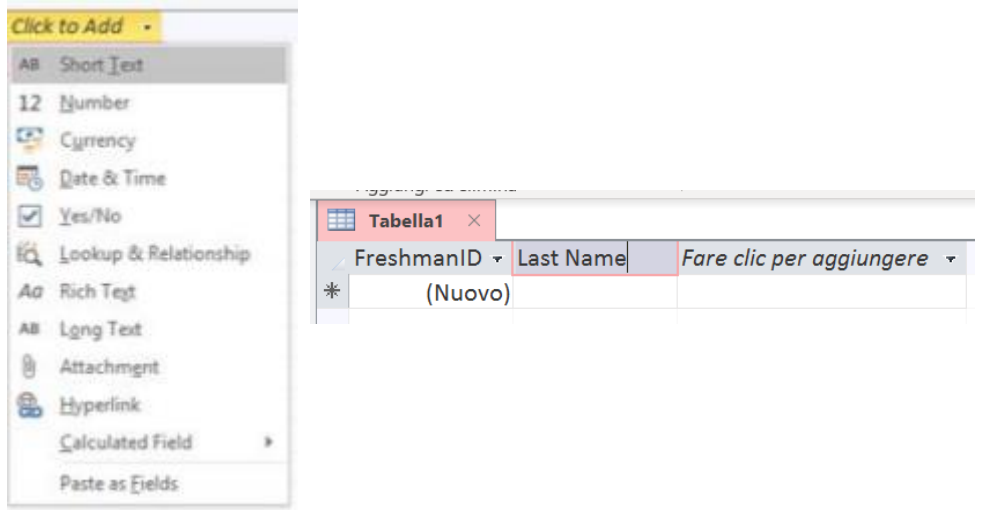

Fig.14: Typing the field name

Manual input

8. Similarly, add all the required fields.
9. Once all fields are added, click on Save icon.
10. The Save as window will appear.
11. Enter the name of your table in the Table Name field, then click on OK.
12. Now, you can enter the data you want.

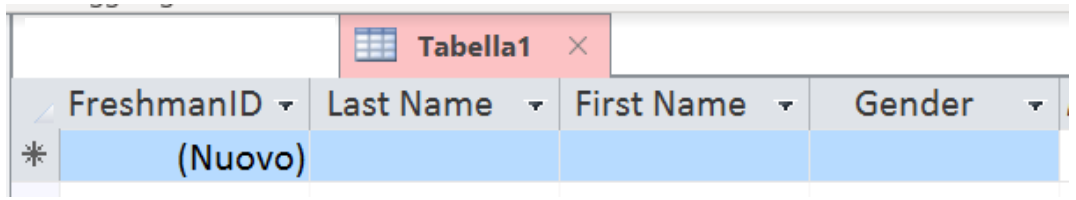

Fig.15: Entry of all fields

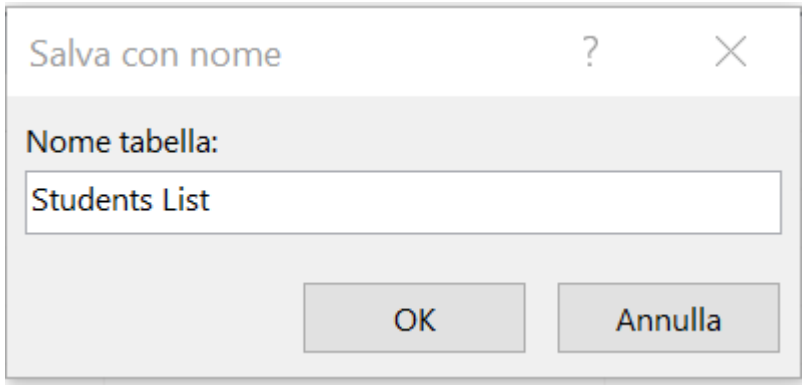

Fig.16: Save as window

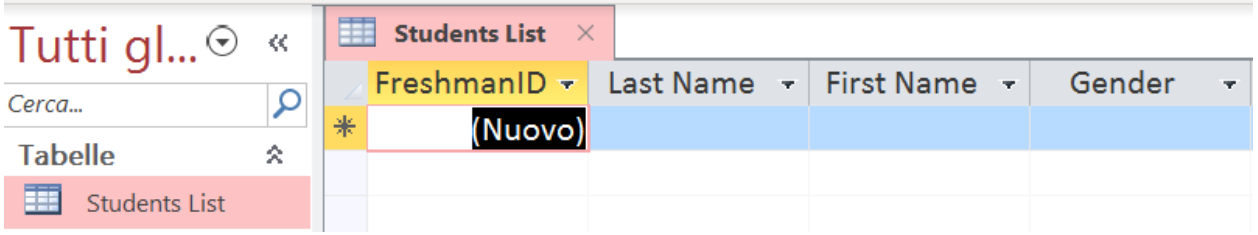

Fig.17: "Student List" Table

Table Design

1. Click on Create Tab.
2. Select Table Design in “Tables” group.
3. In this view, you can see the field name and data type side by side.
4. You can enter each field considering the data type.

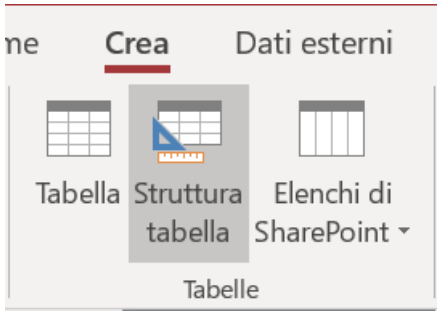

Fig.18: “Table Design” group

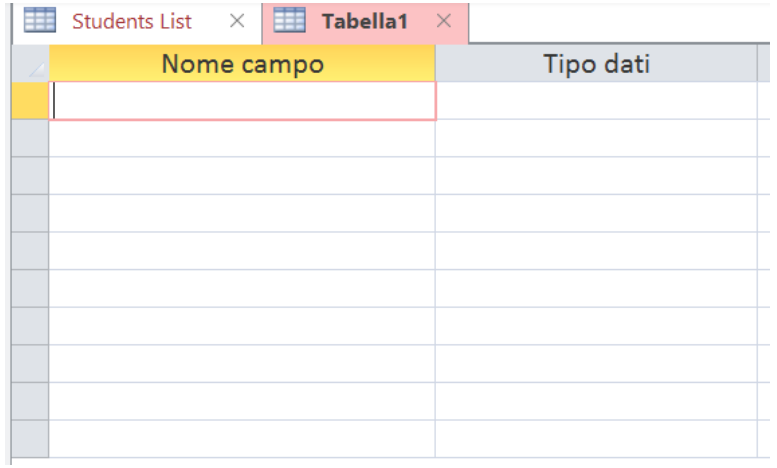

Fig.19: Table view using Table Design

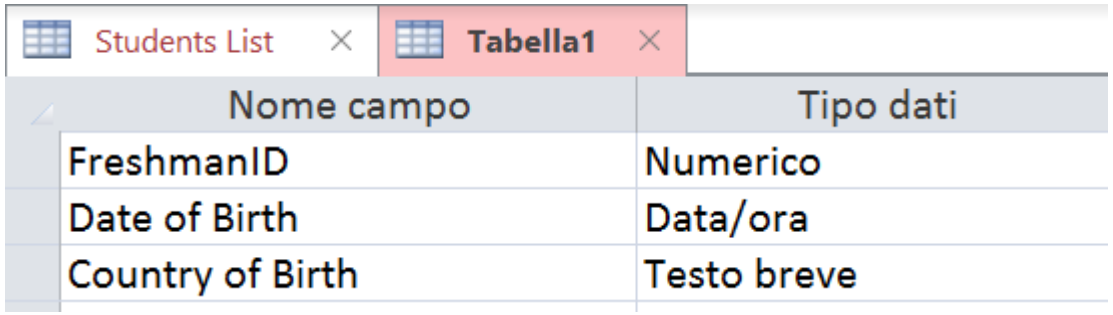

Fig.20: Fields and Data Type

Table Design

- If you want that a field becomes the Primary Key:

5. Select the involved field.
6. Click on Primary Key option in the ribbon.

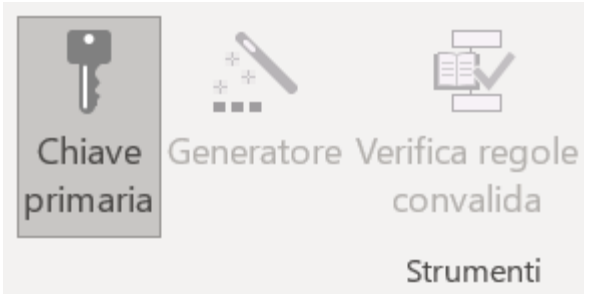

Fig.21: Primary Key

- You can now see a little key icon that will show up next to that field.
- If you want to save the Table, you have to perform the steps above.

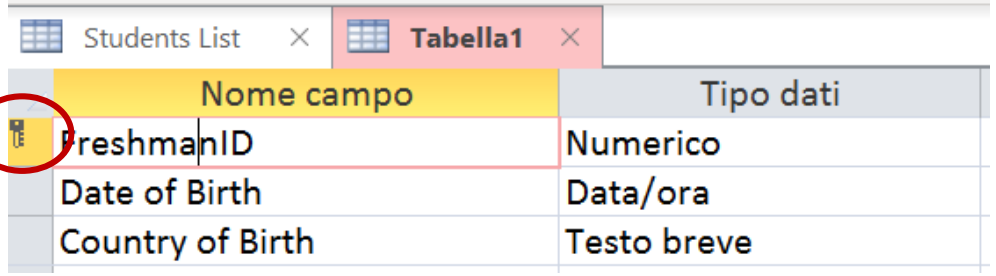

Fig.22: FreshmanID is the Primary Key

TABLES - How to create Tables

- At this point, you may enter in the Table every data you want.

- In All Access Objects, you have two Tables:

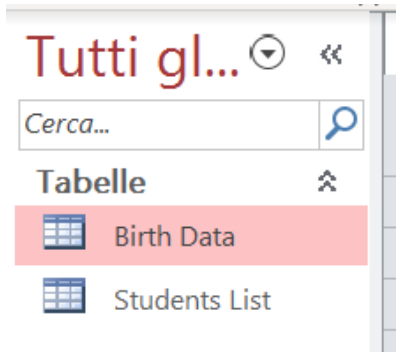

Fig.23: Tables in All Access Objects

Students List | Birth Data

FreshmanID	Last Name	First Name	Gender
1034560	Bonazzi	Elena	Female
1027913	Accaputo	Stefano	Male
1026782	Beloli	Daniele	Male
1035782	Rinaldi	Romualdo	Male
1034561	Colombo	Sveva	Female

Fig.24: Students List Table

Students List | Birth Data

FreshmanID	Date of Birth	Country of B
1034560	10/09/1995	Seriate
1027913	22/01/1993	Treviglio
1026782	17/06/1992	Brescia
1035782	22/09/1996	Bergamo
1034561	12/04/1995	Seriate

Fig.25: Birth Data Table

Data Types

- The most important property for a field is its data type.
- The data type determines the kind of the values that users can store in any given field.
- Each field can store data consisting of only a single data type.
- There are several types of data. The most used are:
    - **Short Text**: Text or combinations of text and numbers, including numbers that do not require calculating (e.g. phone numbers).
    - **Long Text**: Lengthy text or combinations of text and numbers.
    - **Number**: Numeric data used in mathematical calculations.
    - **Data:** Date and time values.
    - **Currency:** Currency values and numeric data used in mathematical calculations involving data with to four decimal places.

FURTHER MATERIAL

To review and deepen the topics of this lecture

1. https://www.youtube.com/watch?v=8PdnTXR2iBc

2. https://www.youtube.com/watch?v=PBhftKTmdHI&list=PL4UezTfGBADBmCOYtQ8QohfIQNY1y3oE7&index=1

3. Alexander, M., & Kusleika, R. (2018). Access 2019 Bible. John Wiley & Sons.