ITEC102 – INFORMATION TECHNOLOGIES

LECTURE 9 – DATABASE PROGRAMS

EASTERN MEDITERRANEAN UNIVERSITY
SCHOOL OF COMPUTING AND TECHNOLOGY

Aim of The Course

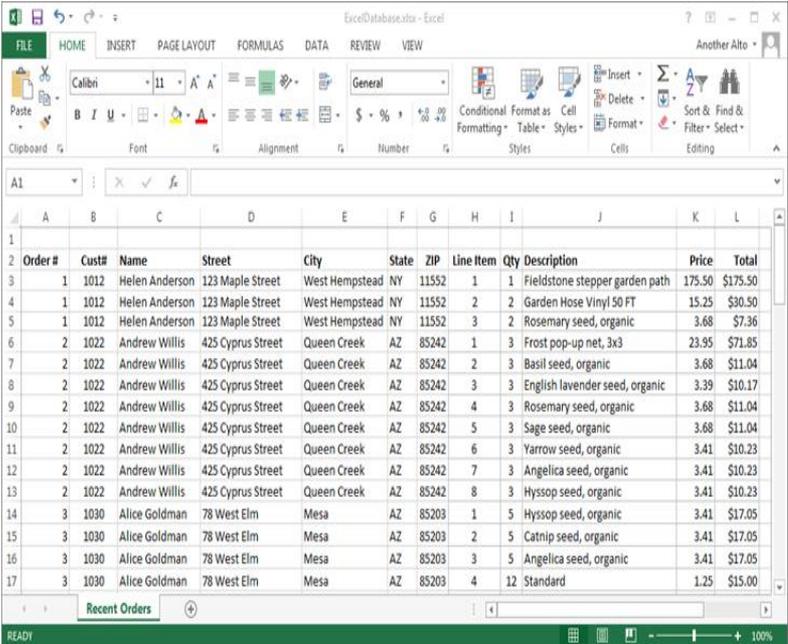The aim of this course is to provide,

- o What is a Database

- o What is Access

- o Components of Microsoft Access 2013

- o Understanding views

- o Relational Database

What is Database?

▶ A database is an organized collection of information

  ▶ The primary function is to store data
  ▶ If the data is well-organized, retrieving the data is easy

▶ The key to designing a database successfully lies in understanding the nature of the data

Databases in Spreadsheets

- Many databases begin as data entered into a spreadsheet
  - the rows and columns are easy to understand
  - all the data is stored in one location
- Spreadsheet databases often contain a considerable amount of repeated data
  - This leads to large file size
 - Complex data relationships cannot be represented

Relational Database Management Systems (RDBMS)

▸ A RDBMS allows you to define, create and maintain databases while providing controlled access to the data

▸ All database applications use SQL to access stored data in a standard manner

▸ Structured Query Language (SQL) is the standard language used to create and interact with databases

Multiple, Related Tables
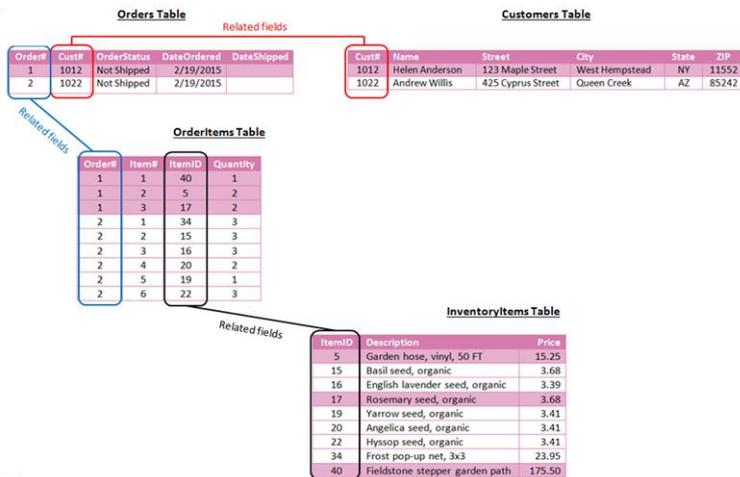
- The data in a relational database is stored in multiple tables
- Each table stores data about a specific aspect of the information
- A complete set of information can be retrieved for a desired entity because the data stored in each table is "related" to the data stored in other tables of the database

What is Access?

▸ Access 2013 is a **RDBMS** and a complete application development environment

  ▸ Includes the tools you need to develop user-friendly interfaces and reports

  ▸ Provides a user-friendly environment for accomplishing database tasks even without prior knowledge

  ▸ Uses SQL code behind the scenes

Database Objects

▸ Tables – store data in rows and columns. In a table, each row is a record, and each record consists of one or more fields

▸ Forms – function as user-friendly interfaces for working with data

▸ Reports – print and summarize data

▸ Queries – extract subsets of data from one or more tables, allowing you to view exactly the data you want

▸ Macros – add functionality to database objects and are often used to automate certain database tasks

▸ Modules – also add functionality to a database, and are stored collections of Visual Basic for Applications (VBA) programming language statements and procedures

Desktop Databases and Access Apps

- An Access app is a new type of database that you create, design and modify in Access 2013 and then use in a standard web browser

- You share Access apps with other users as SharePoint apps

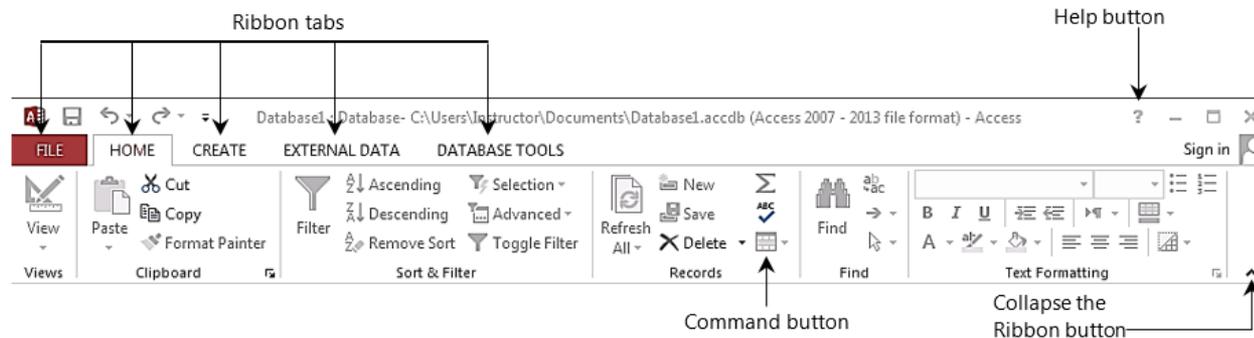- To build an app, select the type of data you want to track and Access creates the database structure for you

Contacts

Components of the Access 2013 User Interface

▸ Ribbon

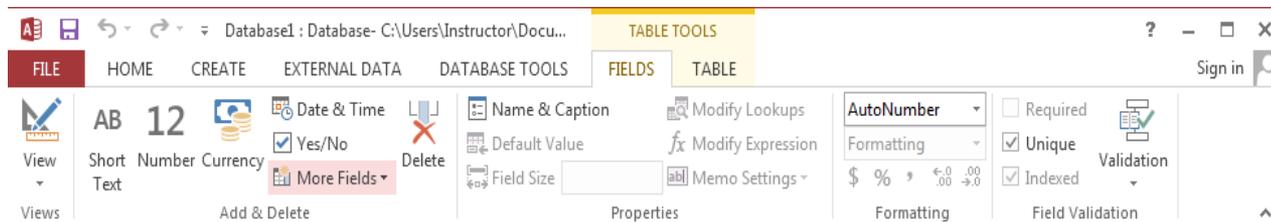▸ Navigation Pane

▸ Backstage view

The Ribbon

‣ The Ribbon contains the commands and options you use to perform database tasks. Each tab contains a group of related commands.
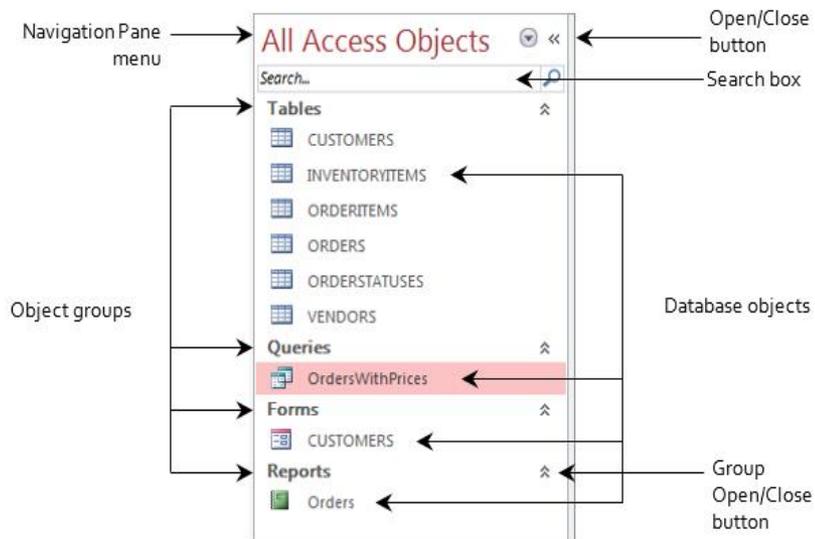
The Ribbon

‣ To reduce screen clutter, contextual tabs appear only when they are applicable. For example, the Table Tools tab appears only when a table is open.

The Navigation Pane

- The Navigation Pane is a central location from which you can use any type of database object
- The Navigation Pane replaces the Database window found in versions of Access previous to 2007.

The Navigation Pane includes:

| Navigation Pane menu	Click the drop-down arrow to open a menu that allows you to specify which objects to show. The default selection is All Access Objects.
Open/Close buttons	Collapses the Navigation Pane so only its Open/Close button and shutter bar display.
Object groups	Organize the objects in a database so you can find what you are looking for.
Database objects	The tables, queries, forms and other objects that exist in the database. Each object appears in its appropriate group.
Search box	You can type the name of an object you want to find

Backstage View
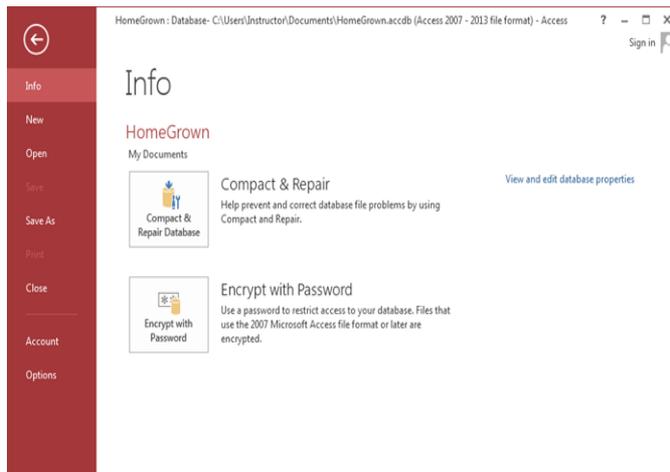
- Used to create, open, save, print and manage databases
- Includes commands and options related to things you can do with a database itself
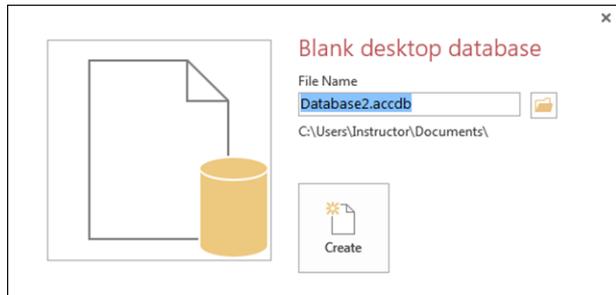- Shows the commands and options available on the File tab of the Ribbon

# Looking at the Screen
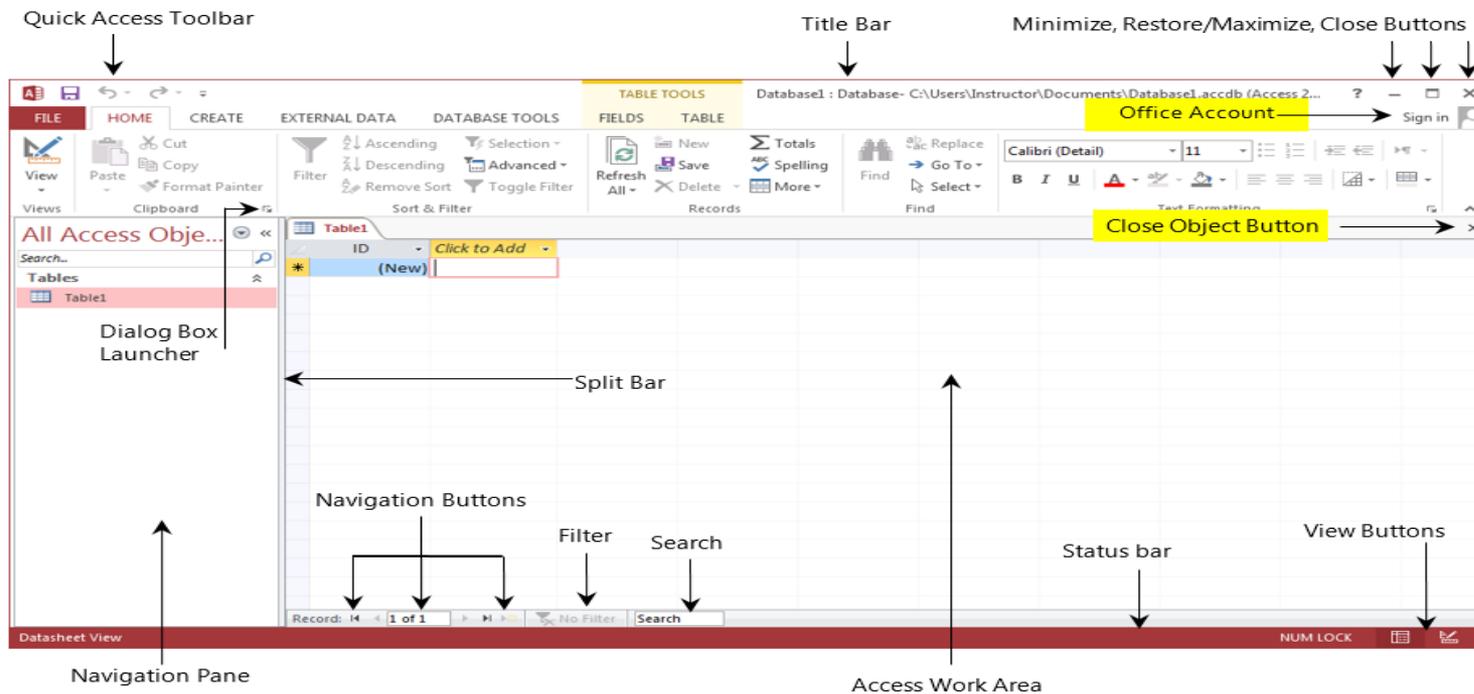
Starting Access
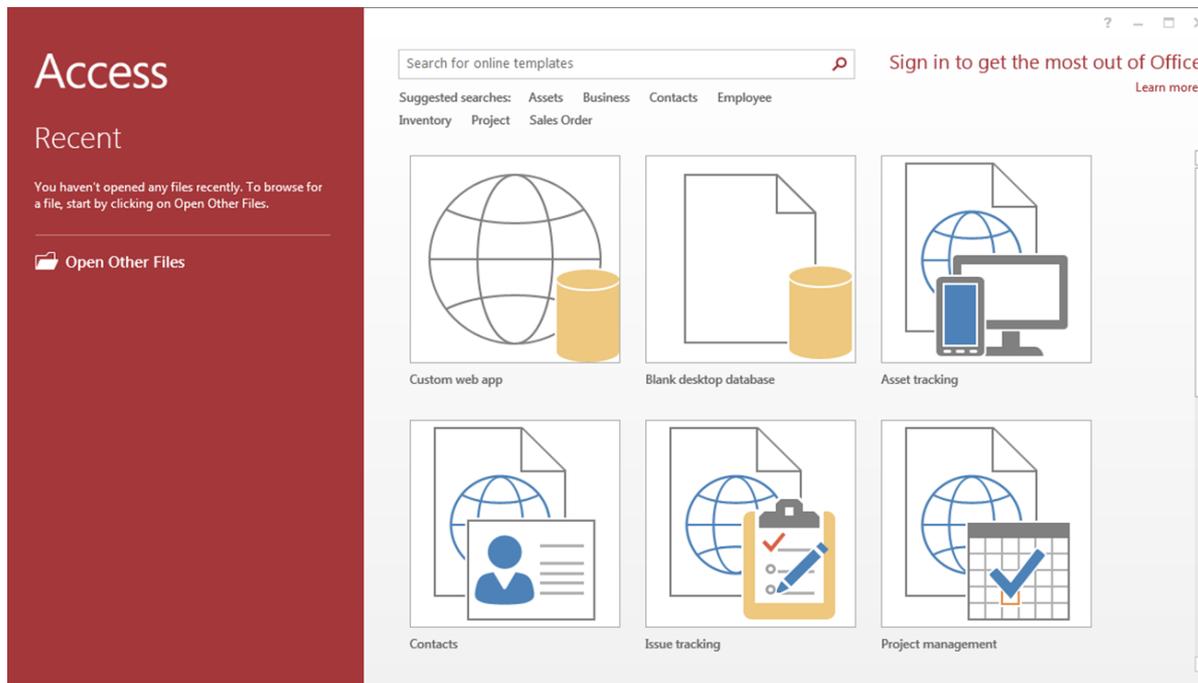
Creating a New Blank Database

- The Blank database template creates an empty database file

- Click the **Browse for a location** button to specify a name and location for the new database

- Specify a file name and location and click **OK** to save your specifications

- Click the **Create** button to create the blank database file

# Creating a Database from a Template

▸ Click a template in the gallery

▸ Specify a name and location

▸ Click **Create**
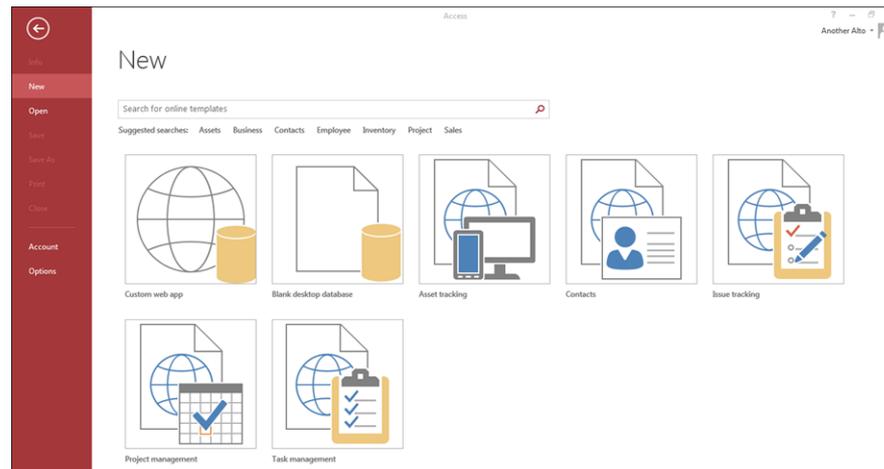
Access opens in a new table in **Datasheet View**

Understanding Views

▸ There are multiple ways to view a database object. The two views for tables are Design View and Datasheet View.

▸ **Design View** is used to set the data types, insert or delete fields, and set the Primary Key

▸ **Datasheet View** is used to enter and view the data for the records
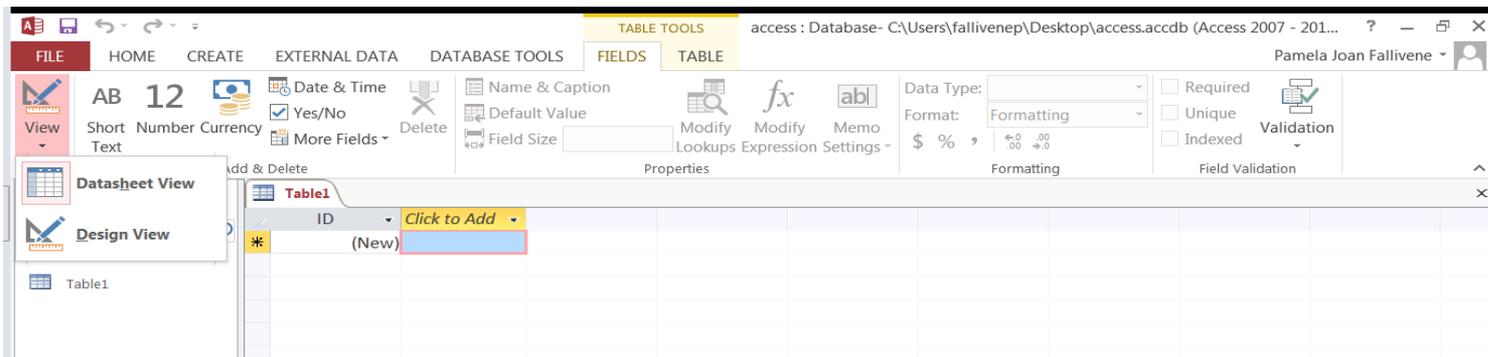
- A table is a collection of data about a specific topic, such as employee

information, products or customers. The first step in creating a table is entering the fields and data types. This can be done in either Datasheet View or Design View but it is recommended to set up the table in Design View.

- **Understanding Fields and Their Data Types**

- **Field** - an element of a table that contains a specific item of information, such as a last name.

- **Field's Data Type** - determines what kind of data the field can store.

Fields and Their Data Types

Format	Use to display
Short Text	Alphanumeric data (names, titles, etc.) - up to 255 characters
Long Text	Large amounts of alphanumeric data: sentences and paragraphs – 64,000 characters
Number	Numeric data
Date/Time	Dates and times
Currency	Monetary values
AutoNumber	Unique value generated by Access for each new record
Yes/No	Yes and No values and fields that contain only one of two values
OLE Object	Pictures, graphs, or other ActiveX objects from another Windows-based application
Hyperlink	A link address to a document or file on the Internet
Attachment	You can attach files such as pictures, documents, spreadsheets, or charts; each Attachment field can contain an unlimited number of attachments per record, up to the storage limit of the size of a database file.
Calculated	You can create an expression that uses data from one or more fields. You can designate different result data types from the expression.
Lookup Wizard	Displays either a list of values that is retrieved from a table or query, or a set of values that you specified when you created the field. The Lookup Wizard starts and you can create a Lookup field. The data type of a Lookup field is either text or number, depending on the choices that you make in the wizard.

To Create a Table in Design View:

1. Click on the Create tab

2. Click on Table

3. Switch over to Design View on the Home tab

4. If prompted to save the table, enter a name and click on OK

5. Type the field names and select the appropriate data type for each field

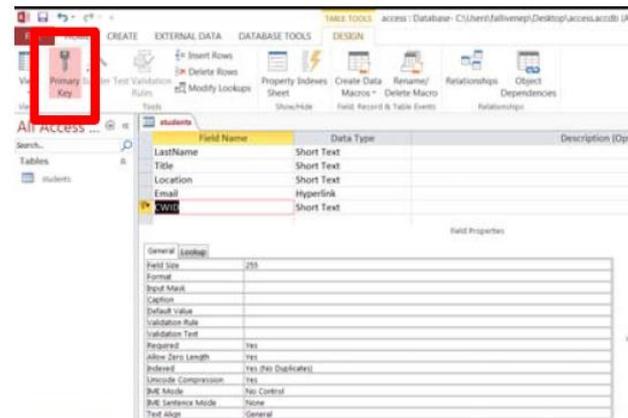6. Continue until all fields are added

To Create a Table in Design View:

Note: The order that you enter the field names is the order the fields will appear in the table.
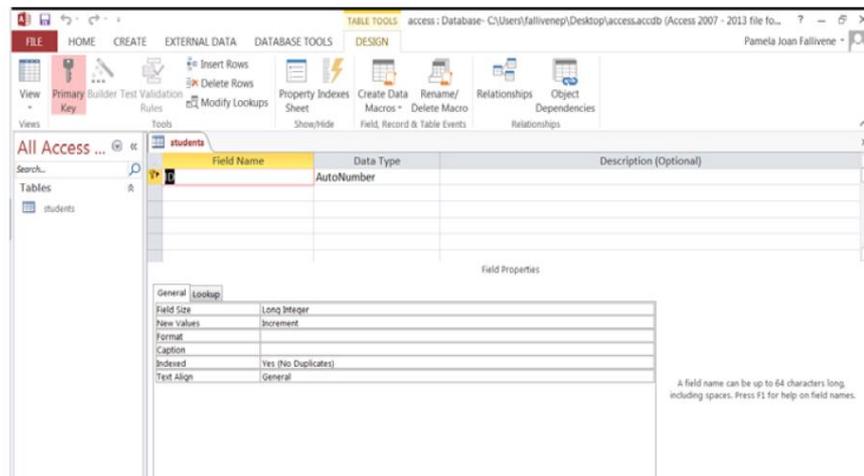
Setting a Primary Key

▸ The Primary Key is the unique identifier for each record in a table. Access will not allow duplicate entries in a primary key field. When creating a new table, Access automatically creates a field "ID"with the autonumber data type, and assigns this as the Primary Key.

Create a table information you should define Field name and Data type and click S

Entering Data in a Table

▸ The Datasheet View button under the Home tab must be clicked to enter the registration information to be placed under the Field Name.
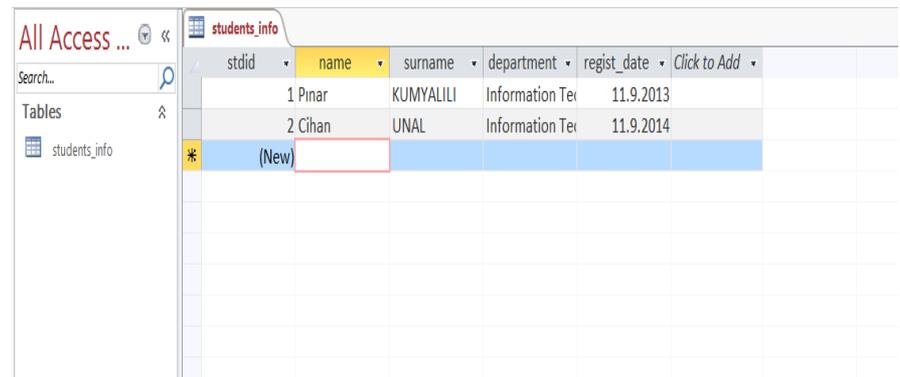
Relational Database

▸ A **relational database** is a set of formally described tables from which data can be accessed or reassembled in many different ways without having to reorganize the database tables.

▸ For example, it is possible to format the Section column in the Student_info table using information in a table named department_info. For this, a second table must be created first.

▸ To add a new table, click the Table button on the Create tab.

▸ To switch to the design screen, click the Design View button and enter the table name in the Save As window.

Relational Database
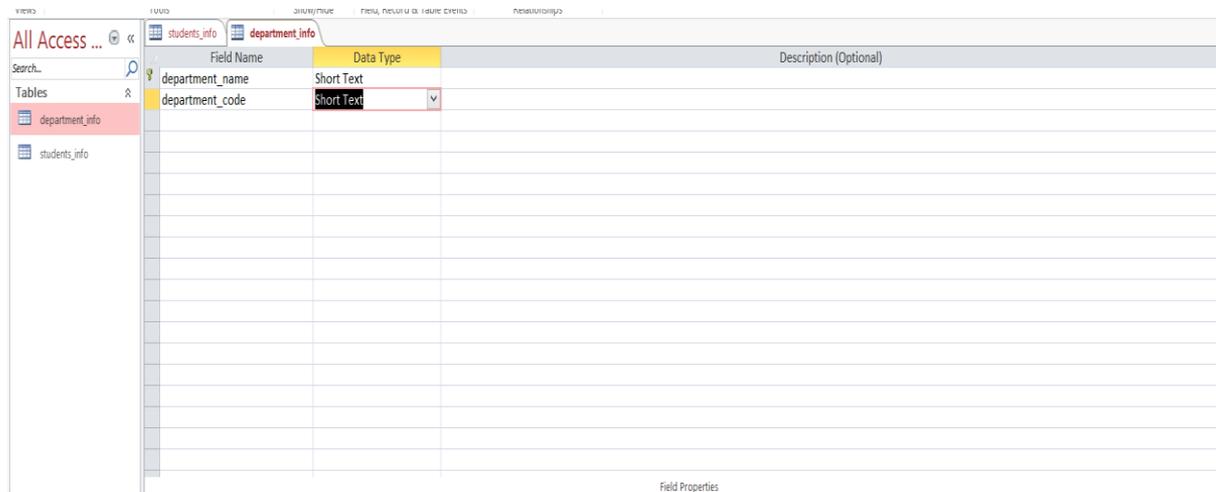
Relational Database

- From the Design View, you must specify the Field Name and Data Type for each column separately.

- The Save button should be clicked once the design phase is complete.
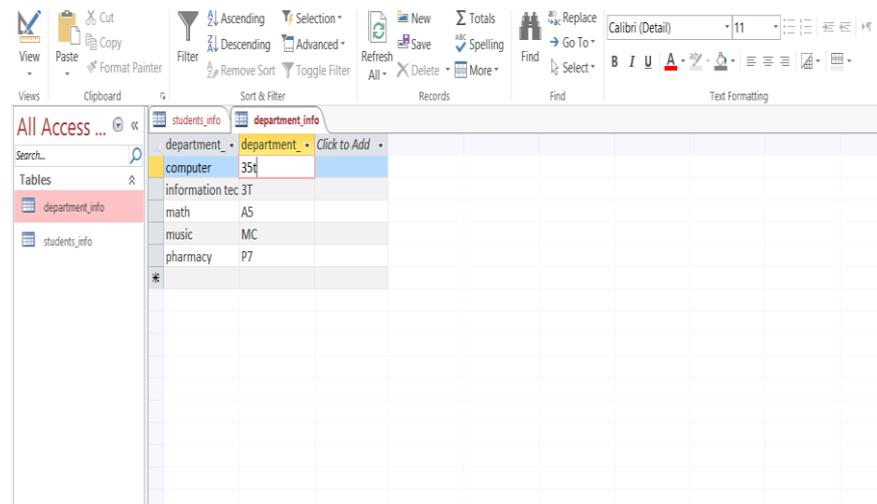
Relational Database

After returning to the Datasheet View window, the data can be entered.
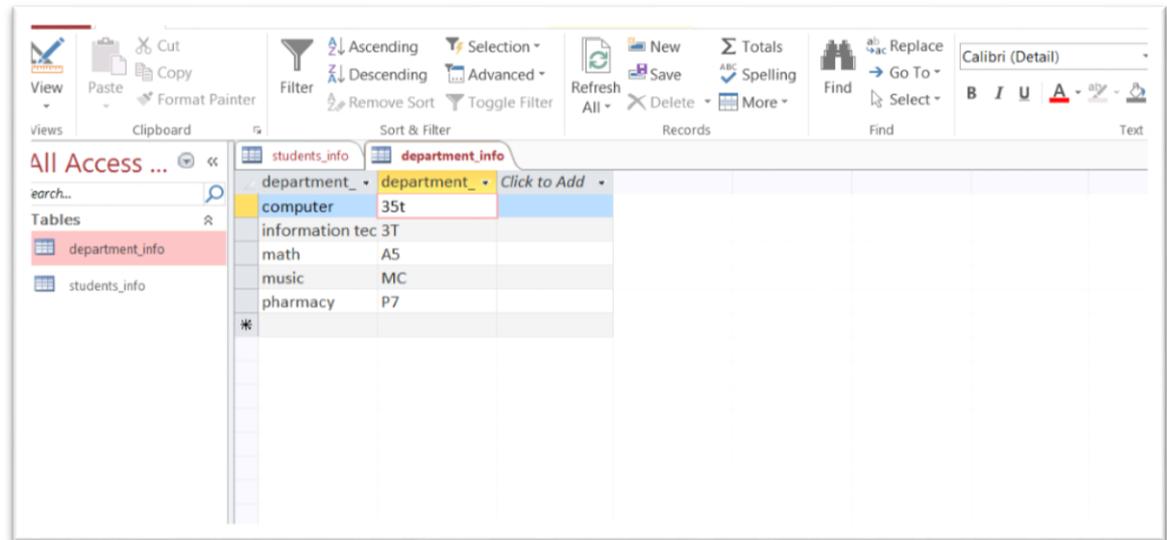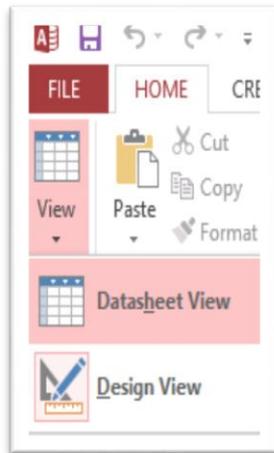
Relational Database

▶ In the department column which is in student_info table, to select data from department_info table select student_info table first and click design view.

▶ Then, select the Field Name that should be edited.

Relational Database

▸ The Lookup Wizard should be selected from the Data Type drop-down list.
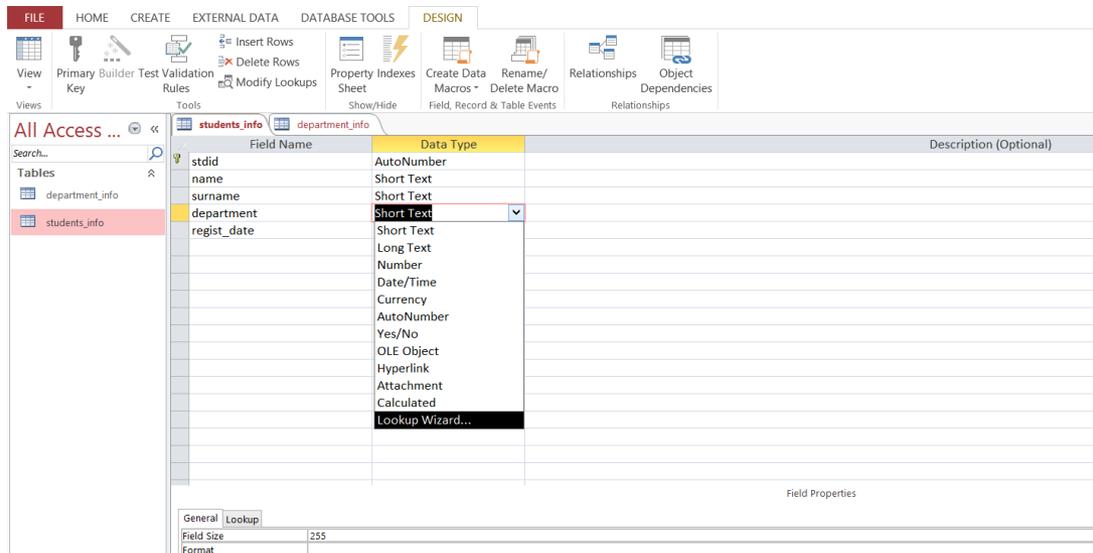
Relational Database

▶ From the next page the default value is '' I want to lookup field to get the values from another table or query '' select, and then click on the Next button.
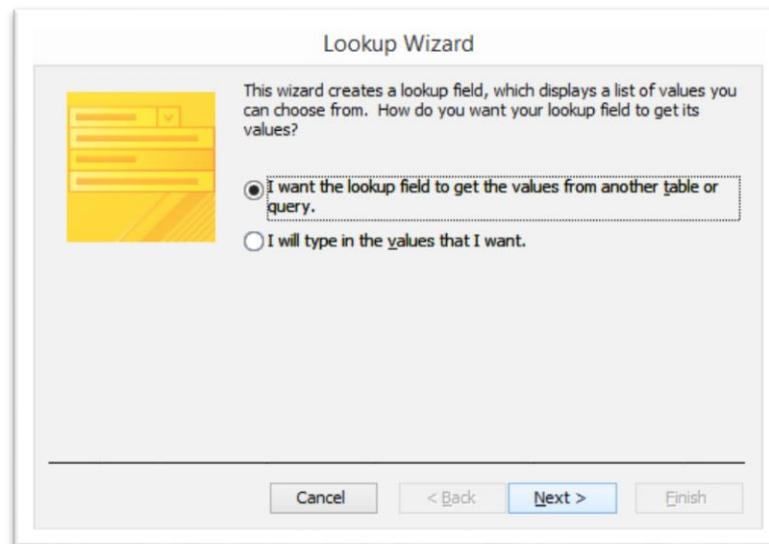
Relational Database

▸ The next page should select the table from which the data will be pulled, and then click the Next button.

▸ Your table must be department_info
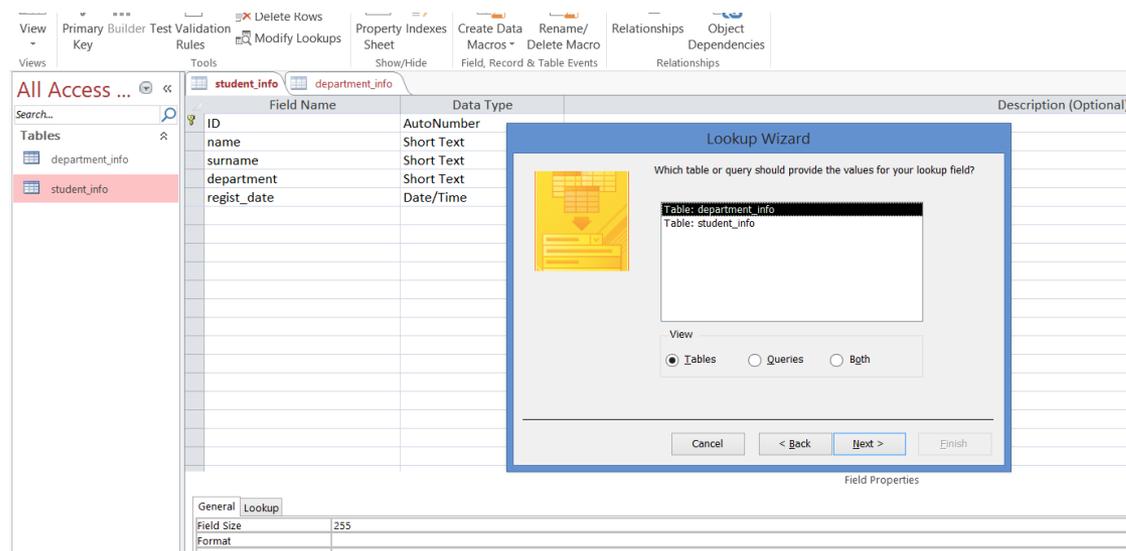
Relational Database

▸ In the third step, department_name column should be selected, and then the Next button must be clicked.
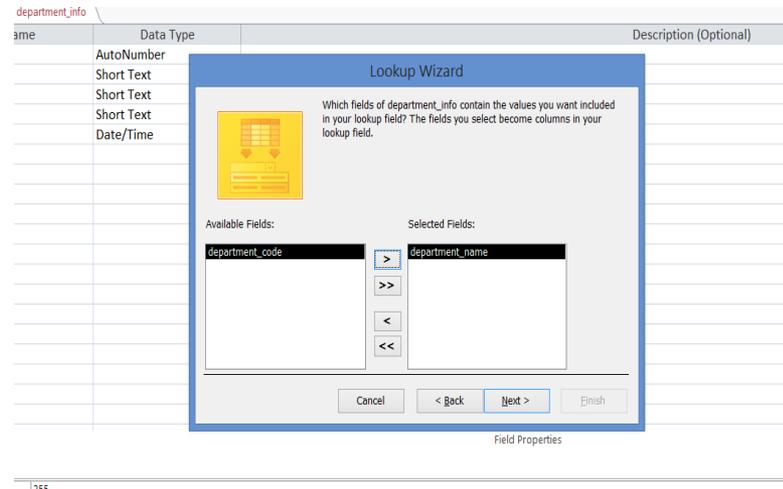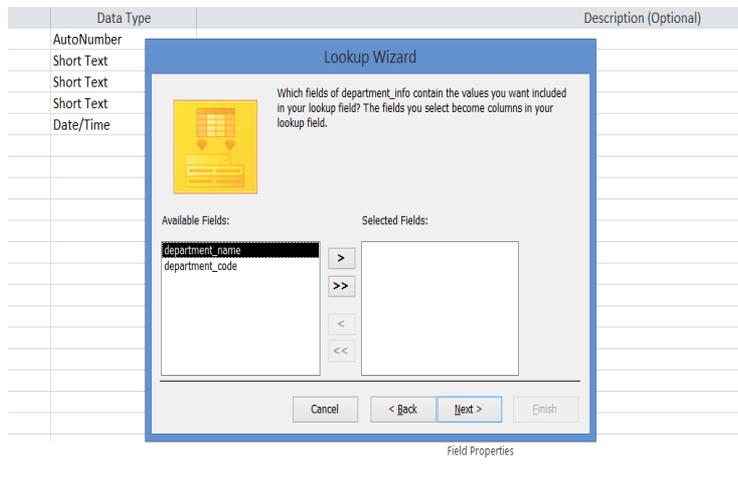
Relational Database

▶ In the fourth step, column order should be select.

▶ The column name must be selected from the drop-down list, the Ascending or Descending alignment method must be applied, and then the Next button must be clicked.

Relational Database

- In the fifth step, the current list will be displayed.
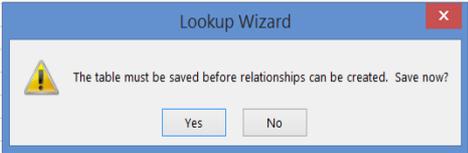- The Next button should be clicked.
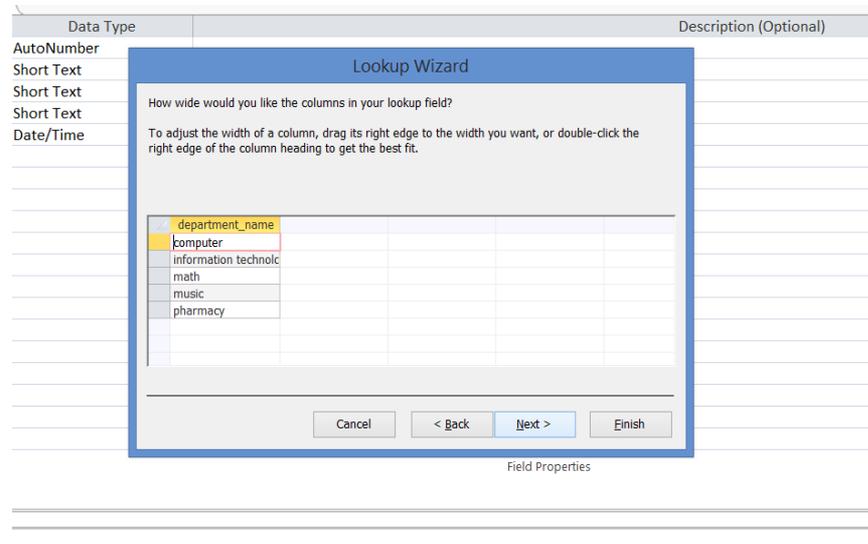
Relational Database

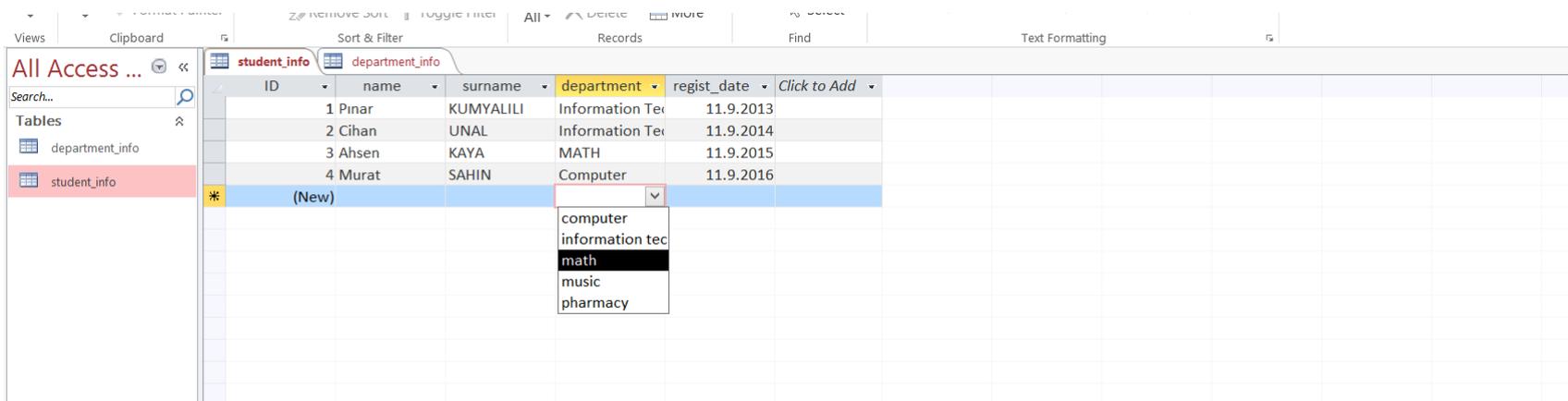Then click the Finish button and save the relationship between two tables.

Relational Database

▸ When a new record is added on the Datasheet View screen, the department column information can be selected from the drop down list.

LECTURE 9
DATABASE PROGRAMS
END OF SUBJECT