

MS-Access

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MS-Access 2016

- 7.1 Database Basics & Table
- **7.2 Form**
- 7.3 Query
- 7.4 Report
- 7.5 Working with Multiple Tables



7.1 Database Basics & Tables

7.1 Database Basics & Tables

- 1) Database basics
- 2) Defining scope of problem and data
- 3) Designing a table
- 4) Data types
- 5) Create tables with microsoft access
- 6) Entering data into table
- 7) Managing fields (adding / moving / deleting field)
- 8) Managing table (copy, rename, delete table)



(1) Database Basics

- Microsoft Access is a Database Management System (DBMS), which is an application software that:
 - Facilitate convenient working with data
 - Enable us to store, search, edit and make report of the data
- In MS Access:
 - Data are stored in tables
 - Tables are organized inside a database

 Table

 Table

Teacher

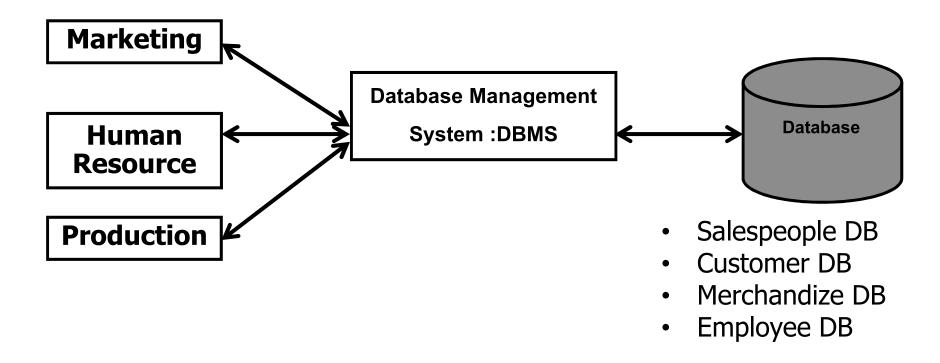
Course

(1) Database Basics (cont.) **Fields Employee First Home Address Telephone** Last Name ID Name Number E001 Smith 552 Main Street, New James York E201 Niranaam Raisakul 5555 Raiteeyuu Rd., 66-53-211451 Chiang Mai E304 Jane 517-355-5554 Doe E511 Pascal Harry An **Employee** Table Records



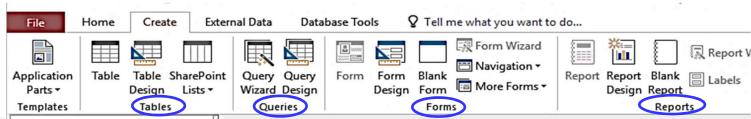
(1) Database Basics (cont.)

Example of database usage in a company



Microsoft Access Objects

- Tables Where data are stored. A table consists of rows (records) and column (types of fields)
- Forms
 User-created interface for easy & quick data entry and editing.
- Reports User-created display of data.
- Queries User-defined filter of data. How you ask database questions.



(2) Scope of Problem and Data

- Before we will create a database, we need to work out
 - 1. What are we working on, and
 - 2. The kind of data do we need to collect and maintain for this work
- This will help we define which data need to be on you database.
- Some questions you need to answer:
 - What is the subject of your interest?
 - Which data do we need/ don't need?
 - (optional) How do we want to collect the data?
- The answers to these questions will help you set the scope of your data. Without it, you might collect too many irrelevant data, or missing something.

(2) Scope of Problem and Data (cont.)

- For example, if we want to collect data about students, there will be a lot of related data:
 - Student ID, name, birthday, place of origin, address, telephone number, faculty, major, minor, GPA, hobby, etc.
- We need to work out what are our interest in the students, and what do we want to know about them.
- Make sure to set up the scope, so that we have the list of only relevant data, before moving on to the next step...

(2) Scope of Problem and Data (cont.)

- Back to student table example
 - We start at basic information we want to know about student: ID, Title (Mr., Ms.), First Name, Last Name, Birth Date, GPA, Address...
 - Maybe we want to conduct a research on student's income → Allowance
 - ➤ We also might want a way to contact the student → E-mail address
 - ➤ And maybe blood type, in case of an emergency → Blood Type
- Again, work out what we want to know.

(3) Designing a Table

- The data will be about student, so we have a Student table. The record will be information about each student.
- Once we know which data we want to store, each piece of the information will be a field in a student record. The list of the field is on the right.
- Now we need to name and specify the fields, to create the table on MS Access.

Field Name Restriction

- No longer than 64 characters
- The name cannot:
 - Have special characters such as . ! ' []
 - Start with space
- If our field name violates a restriction, MS-Access will display "field name invalid" error message dialog box.

Stu	de	ent	

Student ID

Title

First Name

Last Name

Address

Birth Date

GPA

Blood Type

Allowance

E-mail Address

(3) Designing a Table (cont.)

With that in mind, we can select field names. Usually, we don't want any space in a field name

What we want to store	Field Name
Student ID	idStudent
Title	title
First Name	firstName
Last Name	lastName
Address	address
Birth Date	birthdate
GPA	GPA
Blood Type	bloodType
Allowance	allowance
E-mail Address	email

(4) Data Types

- After we have named the fields, we need to assign data types for them.
- Data type will dictate what can be store in that field.
- The following tables will show data types available in MS Access.

Data type	Description	Sizes
Short Text	Alphanumeric data (names, titles, etc.)	Up to 255 characters.
(formerly known		
as "Text")		
Long Text	Large amounts of alphanumeric data:	Up to about 1 gigabyte (GB),
(formerly known	sentences and paragraphs.	but controls to display a
as "Memo")		long text are limited to the
		first 64,000 characters.
Number	Numeric data.	1, 2, 4, 8, or 16 bytes. (more
		later)
Large Number	Numeric data.	8 bytes.
		For more information, see
		Using the Large Number data
Hเนะวิทยากาสตร มหาวิทยาสยเชียวแทม		type.

Data type	Description	Sizes
Date/Time	Dates and times.	8 bytes.
Currency	Monetary data, stored with 4 decimal places of precision.	8 bytes.
Yes/No	Boolean (true/false) data; Access stores the numeric value zero (0) for false, and -1 for true.	1 byte.
OLE Object Pictures, graphs, or other ActiveX objects from another Windows-based application.		Up to about 2 GB.

Data type: Number

- Byte Use for integers that range from 0 to 255. Storage requirement is 1
 byte.
- Integer Use for integers that range from -32,768 to 32,767. Storage requirement is 2 bytes.
- Long Integer Use for integers that range from -2,147,483,648 to 2,147,483,647. Storage requirement is 4 bytes.
- Single Use for numeric floating point values that range from -3.4 x 10^{38} to 3.4×10^{38} and up to seven significant digits. Storage requirement is 4 bytes.
- Double Use for numeric floating point values that range from -1.797 x 10^{308} to 1.797 x 10^{308} and up to fifteen significant digits. Storage requirement is 8 bytes.

For Student table, we may use the following data types:

Data	Field	Data Type
Student ID	idStudent	Short Text – 9 bytes
Title	title	Short Text – 4 bytes (Mr., Ms.,)
First Name	firstName	Short Text – 20 bytes
Last Name	lastName	Short Text – 20 bytes
Address	address	Short Text – 40 bytes
Birth Date	birthdate	Date/Time
GPA	GPA	Number – single (2.51, 4.00)
Blood Type	bloodType	Short Text – 3 bytes (A+, B-, AB+,)
Allowance	allowance	Number - integer
E-mail Address	email	Short Text – 30 bytes

(5) Creating a Table with MS Access

Now, we will use Microsoft Access 2016 to create tables First, we will create a folder to put the database in.

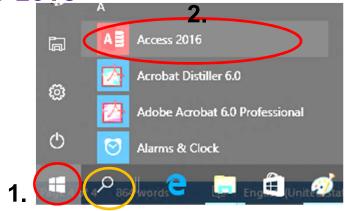
Create a folder with you student ID

Drive ? (Flash drive / Drive C / Drive D:)

For example G:\600501234>

First, we will open Microsoft Access 2016 by doing the followings:

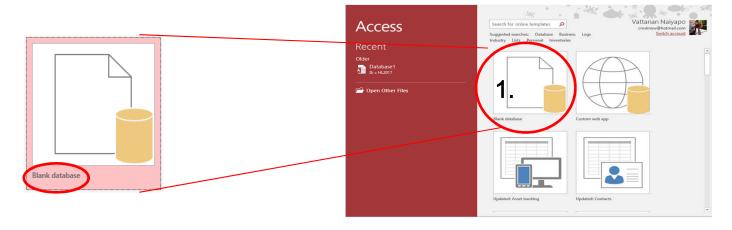
- 1. At the task bar click the windows icon
- 2. click *Access* 2016





If you cannot find Access 2016 click search and type

Once Microsoft Access start, we will see the screen below, we will create MyStudent database with the following steps:



1. click Blank database

- 2. Then, do the following
- 2.1 At File name: put in the name of the database. *MyStudent*, for this example
- 2.2 Specify where the database will be by clicking at

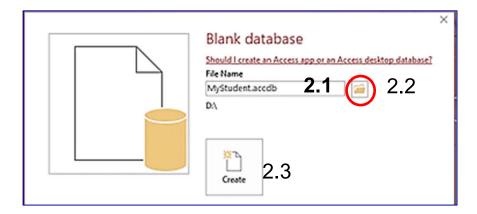
 File and folder dialogue will appear, selec where you want to

 put the database file. Also, specify Save as type:

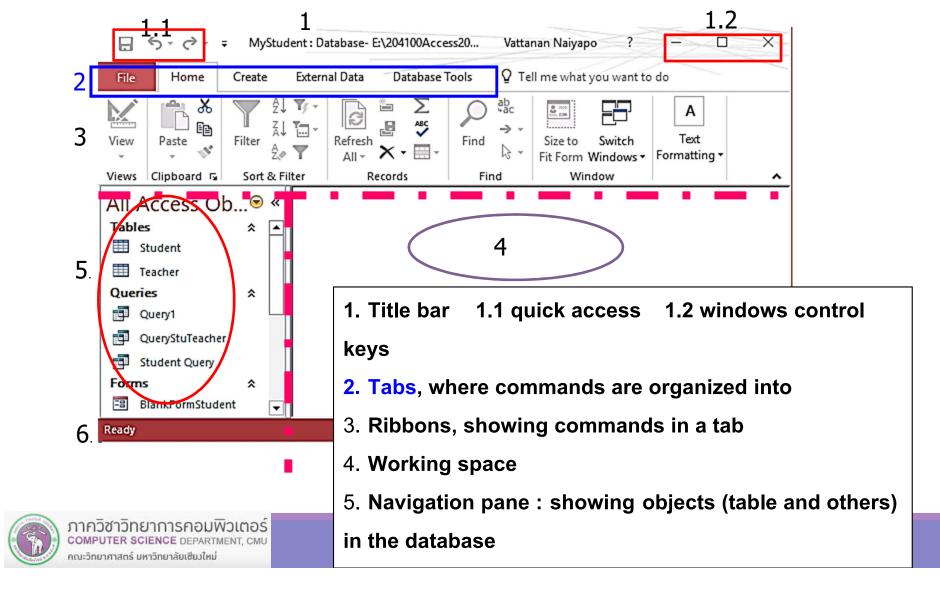
 as Microsoft Access 2007-2016 Database

We will get MyStudent.accdb

2.3 click Create



What are on MS-Access's User Interface



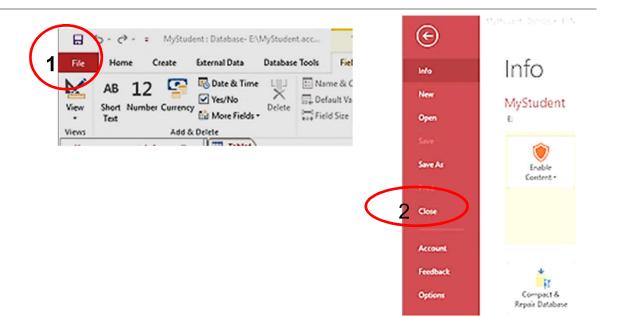
Before we start, we'll learn to do the followings with MS Access:

- Closing a database
- Closing MS-Access
- Opening a database
- Saving with Save / Save-as

After that, we'll learn how to create a table

Closing a DB

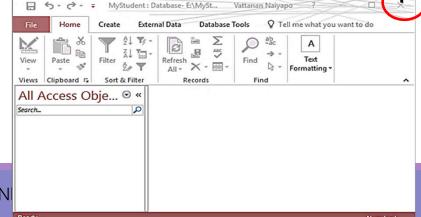
- 1. Click File tab
- 2. Click Close



Closing MS Access

At the top right corner

1. click X to close windows



Short Number Currency

MyStudent: Database- E\MyStudent.acc...

Database Tools

□ Name & C

Default Va

External Data

Yes/No

Add & Delete

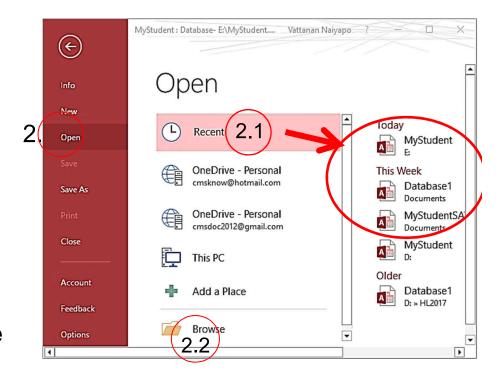
Date & Time

Views

Opening a database

- 1. Click File tab
- 2. Click Open then select the database:
- 2.1 Recent for databases that were open recently
- Or 2.2 Browse look for a database file

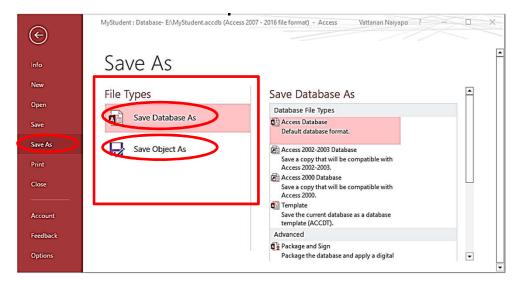
The select database file will then be opened and appear.



Saving with Save / Save As

- Save will save changes on objects in the database
- Save As will allow you to save the database as another file, File Types to make a copy. You can also make a copy of objects in the database

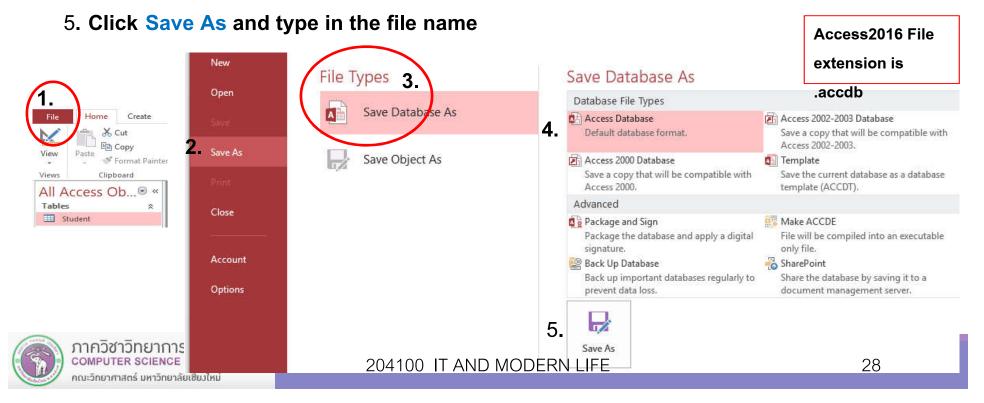
We will continue with more information on Save As





Save As – Saving Database as Another File/ Another File Type

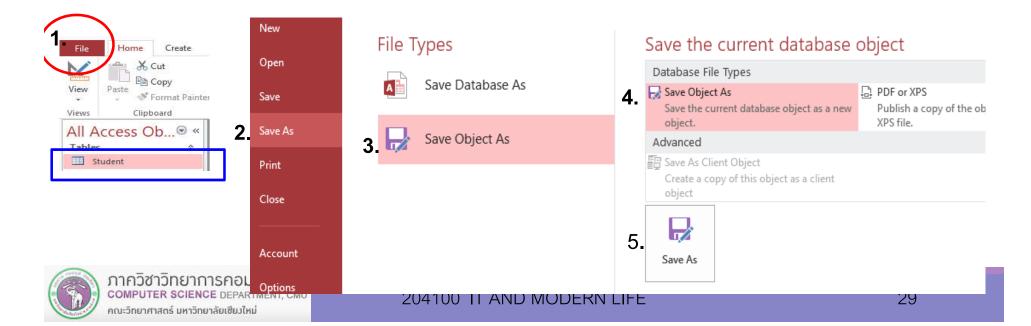
- 1. Click File tab
- 2. Click Save As
- 3. At File Types, select Save Database As
- 4. At Save Database As → Database File Type, select Access Database Select the version you want, 2016 will be what we are working on



Making a copy of an object (Sava As – Save Object As)

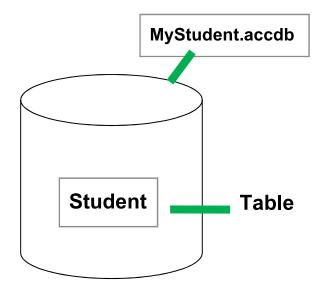
At navigation pane, double click **Student** table to select it, then:

- 1. Click File tab
- 2. Click Save As
- 3. At File Types, select Save Object As
- 4. At Database File Types, select Save Object As
- 5. Click Save As and type in the file name for the table



Creating a Table

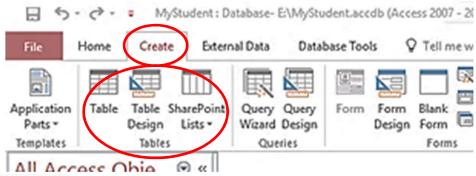
- Usually, a database will have multiple tables
- Our starting example will have one table
- The file extension (type) for Access
 2016 (and some earlier) database
 file is .accdb



We can create a table and start it on different views

- To create a table, go to Create tab
- Under Tables group, select a command to create a table from these 3 commands:
 - Table to create a table and go to input data
 - Table Design to create a table and go to Design view
 - SharePoint Lists will link to SharePoint program

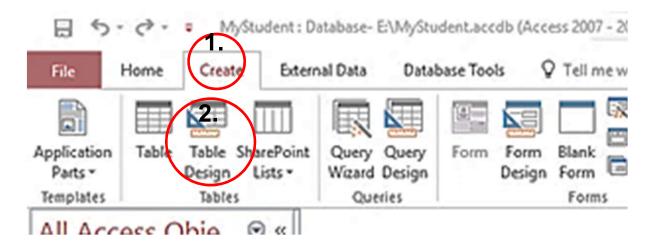
For now, we will select Table Design





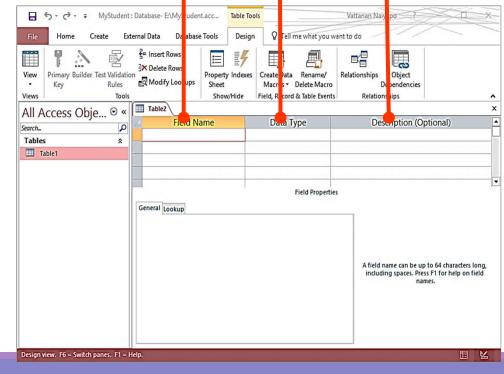
Creating Student table on MyStudent database

- 1. Click Create tab
- 2. Click Table Design command



We will input field names and data types as we have designed

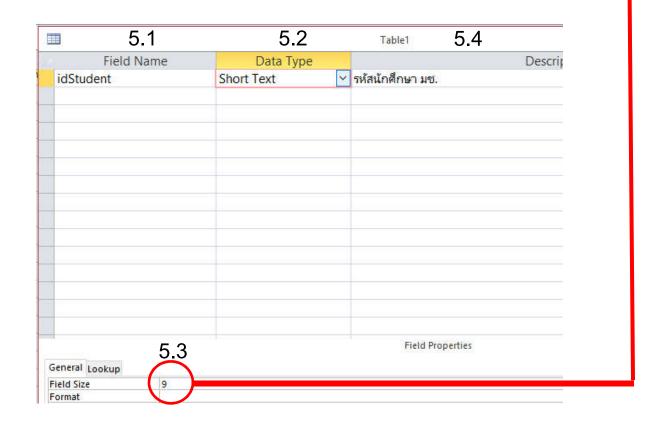
- Field Name the name of the field←
- Data Type for that field
- Description to put some notes about the field



Specifying a field for Student table

- 5.1 Type idStudent under Field Name
- 5.2 Select Short Text under Data Type
- 5.3 Below, under General tab \rightarrow Field Size type in 9
- 5.4 Type some explanation under Description

By default, the field size for Short Text will be 255 bytes



Enter Field Name and Data Type as designed:

idStudent Short Text 9 bytes

title Short Text 6 bytes

firstName Short Text 20 bytes

lastName Short Text 40 bytes

GPA Number Single

bloodTypeShort Text 3 bytes

allowance Number Integer

email Short Text

and the	Field Name	Data Type	
8	idStudent	Short Text	9-digit ID for CMU Students
	Title	Short Text	Mr, Ms., or Other
	firstName	Short Text	
	lastName	Short Text	
	Address	Short Text	
	birthDate	Date/Time	
	GPA	Number	0 00 - 4.00
	bloodType	Short Text	
	allowance	Number	
	email	Short Text	

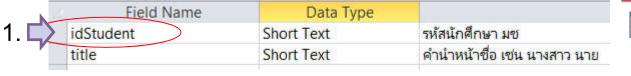


- A primary key (PK) is a field, or a combination of fields, with a value that makes each record (row) in a table unique.
- Primary keys are another way to avoid duplicating your data, because you can never duplicate a value in a primary key field
- Primary key will make searching faster and more convenient
- Looking at the fields in the Student table, the only field that will never repeat is idStudent. Therefore, we will set idStudent as primary key.
- After a primary key is set, if we enter a record with duplicate primary key, MS-Access will not allow it, and will display an error message.

(5) Creating a Table (cont.)

Setting idStudent field as the primary key for Student table Follow these steps:

- 1. Click idStudent field name
- 2. Under Design tab, click Primary Key toggle





A key icon will appear in front of idStudent this means that this field is the primary key, as shown:

Field Name	Data Type	
idStudent	Short Text	รหัสนักศึกษา มช
title	Short Text	คำนำหน้าชื่อ เช่น นางส
firstName	Short Text	

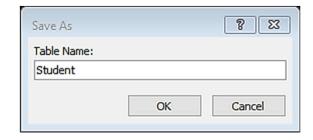
If no primary key is selected, MS-Access will prompt to automatically create one. If we answer Yes, field ID, which is Autonumber (counter) will be



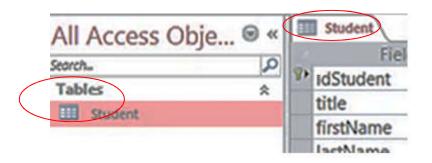
(5) Creating a Table (cont.)

After primary key is selected, we will save the table:

- Click Save
- The Save As dialog appears
- Type Student under Table Name:
- Click OK



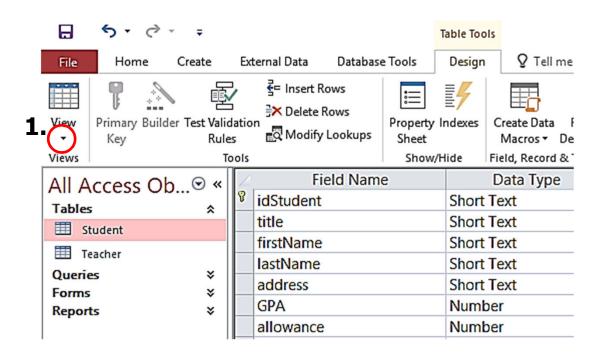
After saving, then table will appear as below.

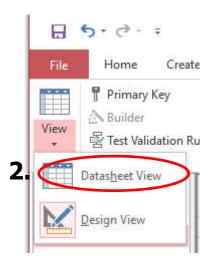


(6) Entering Data into a Table

Now we will enter data into Student table:

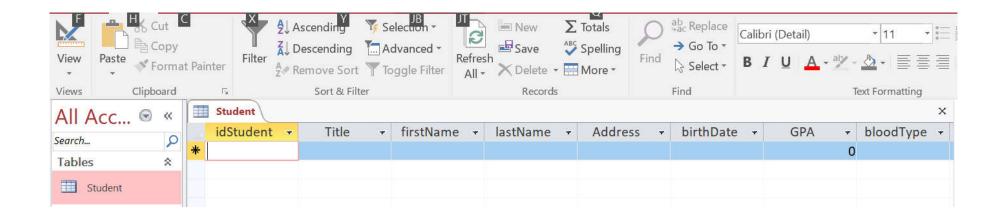
- 1. Click View to get view options
- 2. Select Datasheet View





(6) Entering Data into a Table (cont.)

3. Datasheet view will appear, where you can enter data into Student table.



(6) Entering Data into a Table (cont.)

4. Enter data into Student table

We can widen a field by moving the mouse to cell edge, the mouse cursor will change (like in excel) click and drag to change the field's width, or double-click to automatically adjust the width

5. Click Save to record the data

	z	idStudent -	title	 firstName - 	lastName	*	address	عالر	GPA →	allowance -
		59051234	นาย	เกียรติ	กรุณา		77 ม.7 ต.สันผีเสื้อ อ.เมือง จ.เชียงรา		3.1	1500
		59051281	นางสาว	วารี	รักอาชีพ		55 ม. 3 ถนนหน้าเมือง อ.เมือง จ.กำแ	w	2.5	2000
4.		59061281	นางสาว	ปรารถนา	วรชาติ		56 ม.5 ต.ผักหวาน อ.เมือง จ.เชียงให	3.1	1.9	2500
		59061599	นางสาว	พร	ใกรวุฒิ		89/7 ถนนหน้าเมือง อ.เมือง จ.เชียงใ	หร	2	1800
		60051234	นาย	จักร	ปัญญาดี		125/8 ถนนรถไฟ อ.เมือง จ.ลำพูน		2.9	2200
	*				The state of the s				0	0



(7) Managing Fields - Adding, Deleting and Moving

Select a table, then you can make change to the fields in that table We will work with example Student table

- 1. Select the Student table
- 2. Click Home \rightarrow View
 - 2.1 Select Design View





(7) Managing Fields – Adding, Deleting and Moving (cont.)

Design View will appear:

	Field Name	Data Type		
idStu	ıdent	Short Text	9-digit ID for CMU Students	
Title		Short Text	Mr, Ms., or Other	
firstN	lame	Short Text		
lastN	lame	Short Text		
Addr	ess	Short Text		
birth	Date	Date/Time		
GPA		Number	0.00 - 4.00	
bloo	dType	Short Text		
allow	<i>i</i> ance	Number	Baht/Month	
emai	Ī	Short Text		
emai	II.	Snort Text		

(7) Managing Fields — Adding Field

On Student table field name pet, which is the type of pet the student keep, with data type of Short Text, and field size of 15 bytes.

Do the followings:

1. Click to highlight the field we want to insert a field above it.

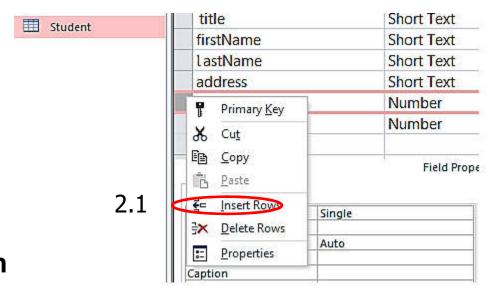
	2	Field Name	Data Type	
	8	idStudent	Short Text	9-digit ID for CN
		Title	Short Text	Mr, Ms., or Othe
		firstName	Short Text	
		lastName	Short Text	
		Address	Short Text	
		birthDate	Date/Time	
1.		GPA	Number	0.00 - 4.00
<i>V</i>		bloodType	Short Text	
		allowance	Number	Baht/Month
		email	Short Text	



- 2. Then, do either:
- 2.1 Right click the field and select Insert Rows

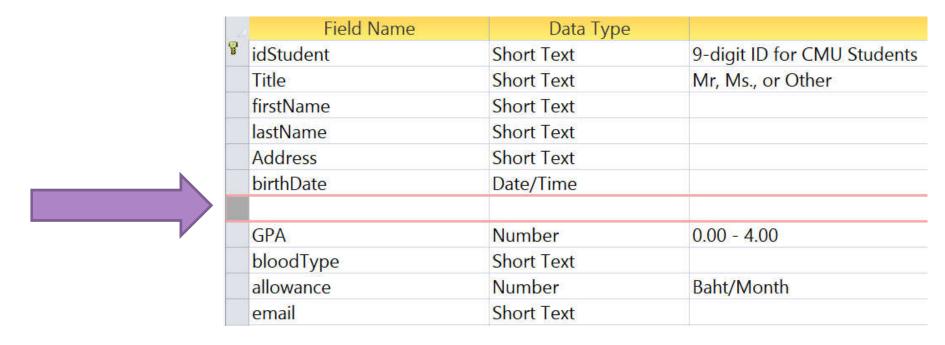
OR

2.2 Under Design tab → Tools group, Click Insert Rows icon



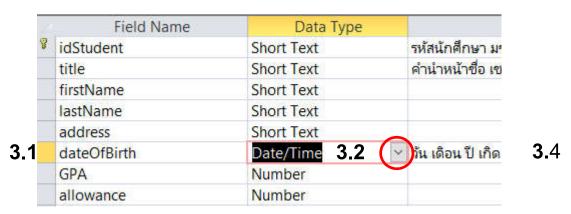
5 · 0 · = Student - Access Table T... Vattanan ∇ Tell Home Create External Data Database Tools Design File 2.2 Primary Key =Builder Property Indexes View Create Data Relation 图 Test Validation Rules Sheet Macros ▼ Delete Macro Views Tools Show/Hide Field, Record & Table Events

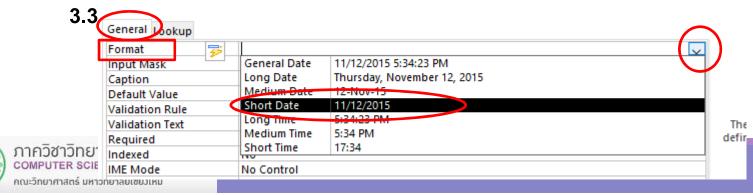
And empty field will appear.



We then can enter field name and set data type for that field.

- 3. ทำงานดังนี้
 - 3.1 click ที่ Field Name พิมพ์ dateOfBirth
 - 3.2 ที่ Data Type click เลือก Date/Time
 - 3.3 แท็บ General ที่ Format เลือก Short Date
 - 3.4 ที่ description พิมพ์ข้อความ วันเดือนปีเกิด

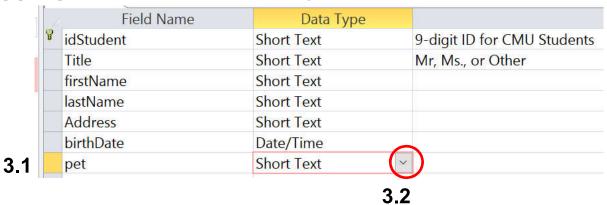


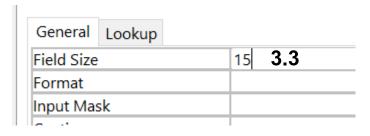


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3. Do as followed:

- 3.1 Click the box under Field Name and type pet
- 3.2 Under Data Type click select Short Text
- 3.3 Under General → Field Size, type 15
- 3.4 Add appropriate notes to Description



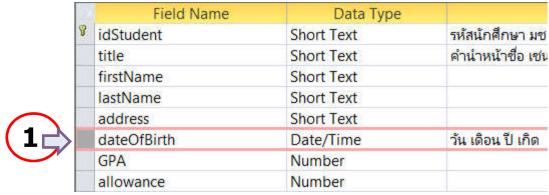




Deleting a Field

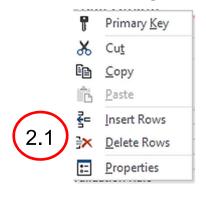
If you want to remove dateOfBirth field from Student table

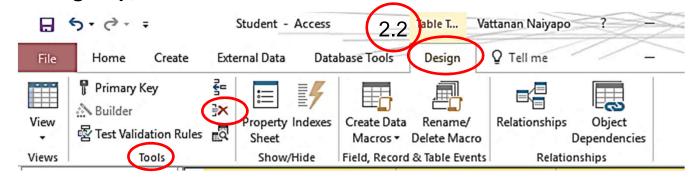
1. Click to highlight the field you want to remove, as shown below



- 2. Then do the following
 - 2.1 Right Click → Delete Rows OR

Under Design tab → Tools group, Click Delete Rows icon



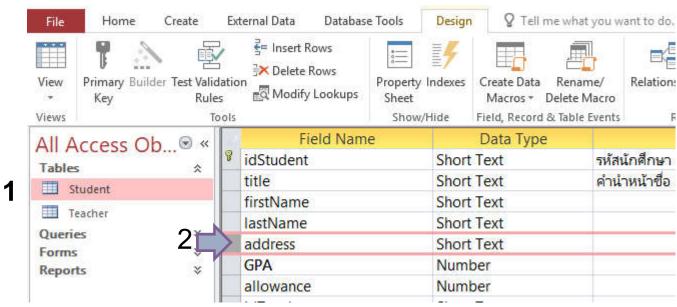


จากนั้น click ที่ปุ่ม Save เพื่อบันทึก Table

(7) Managing Fields - Moving a Field

For example, if we want to move address field to the bottom, we can do it by:

- 1. Student table → Design View
- 2. Click to highlight the field we want to move



(7) Managing Fields – Moving a Field(cont.)

3. Drag mouse to the location you want to move the field to, and release. For example, dragging address field to the bottom.

Note that while you are draggin to mouse, you will see a thick black bar, showing where the field will be moved to.



Result of moving address field

	Field Name	Data Type		
8	idStudent	Short Text	รหัสนักศึกษา มช	
	title	Short Text	คำนำหน้าชื่อ เช่น เ	
	firstName	Short Text		
	lastName	Short Text		
	address	Short Text		
	GPA	Number		
	allowance	Number		

B	Field Name	Data Type	
	idStudent	Short Text	รหัสนักศึกษา
	title	Short Text	คำนำหน้าชื่อ
	firstName	Short Text	
	lastName	Short Text	
	GPA	Number	
	allowance	Number	
	address	Short Text	

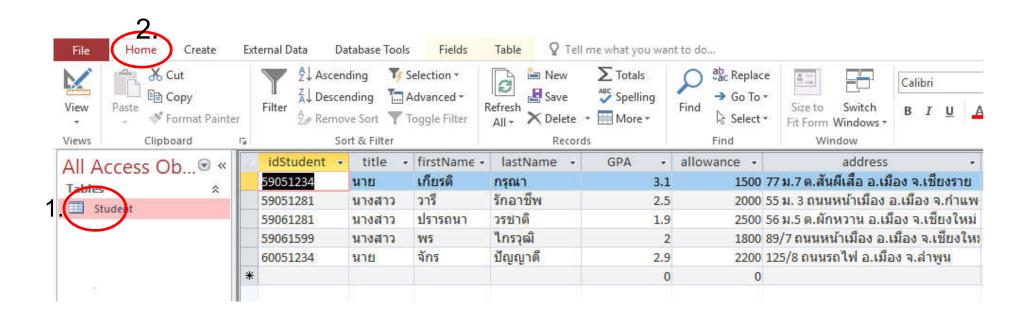
4. Click Save to record the change to Student table.



(8) Managing Table: Copying a Table

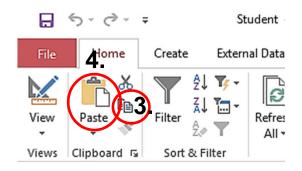
If we want to copy Student table and name the new copy StudentNew, we can do the following:

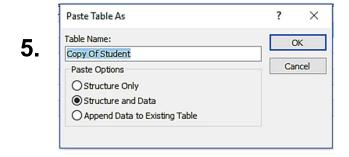
- 1. Click Student table
- 2. Click Home tab



(8) Managing Table: Copying a Table (cont.)

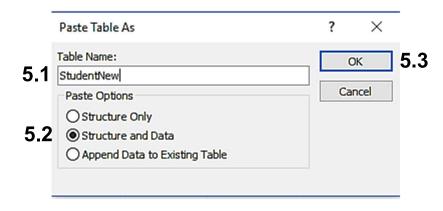
- 3. Under Home tab -> Clipboard group, click Copy icon
- 4. Under Home tab → Clipboard group, click Paste
- 5. A window will appear for us to name the new table





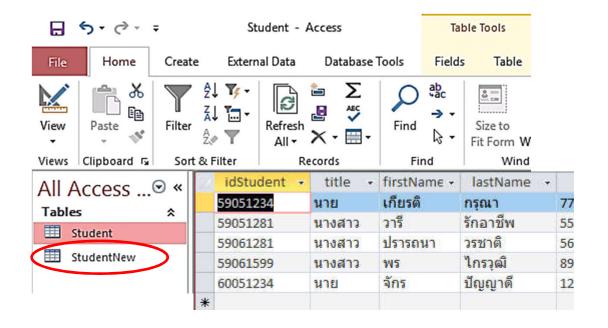
(8) Managing Table : Copying a Table (cont.)

- 5.1 Type in the new name. From the example: StudentNew
- 5.2 Paste Options give us some options to copy the table differently:
 - Structure Only The new copy will have the same structure, but no data
 - Structure and Data The new copy will have the same structure, AND data
- Append Data to Existing Table Data will be put in another table
 In this case we will choose Structure and Data to copy both structure and
- the data in Student table
- 5.3 Click OK



(8) Managing Table : Copying a Table (cont.)

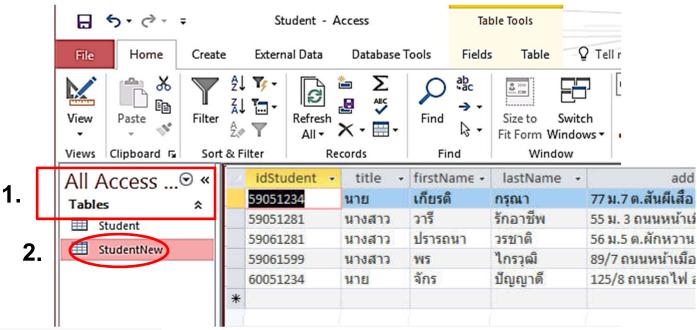
A new table, StudentNew, will appear



(8) Managing Table: Renaming a Table

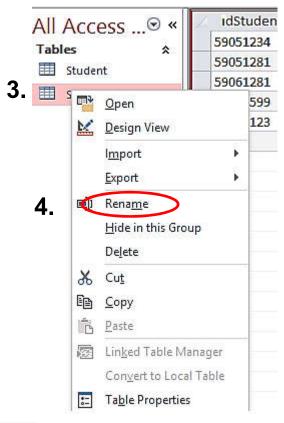
If we want to change the name of StudentNew table to StudentChange, we can do the followings:

- 1. At navigation pane
- 2. Click StudentNew



(8) Managing Table: Renaming a Table (cont.)

- 3. Right click to open the command list
- 4. Select Rename



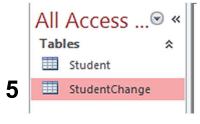
57

(8) Managing Table: Renaming a Table (cont.)

- 4. The name will change into textbox, for we to enter a new name
 - 4.1 Type in the new name. From the example: StudentChange
 - 4.2 Press Enter
- 5. New table name will appear at the navigation pane





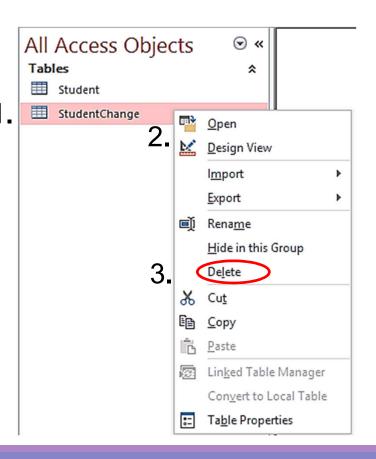


(8) Managing Table : Deleting a Table

To remove StudentChange table from MyStudent database, do the following:

At navigation pane

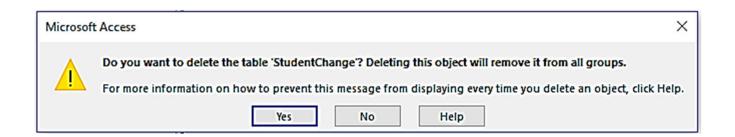
- 1. Click StudentChange table
- 2. Right click to open the command list
- 3. Select Delete



(8) Managing Table : Deleting a Table (cont.)

4. A confirmation window will appear

Click OK and StudentChange table will be remove form MyStudent database



With what you have learn from this chapter, you should be to...

- design and create tables
- manage individual tables, including records and fields inside them
- enter data into tables