

COMP1111

Week 14

Material Review

- Data Types
- Relationships
- Queries
- Forms
- Reports
- 2 ways to do table validation (on design or datasheet view)
- Hide duplicates on reports (sort by field)
- Conditional Formatting
- grouping

Data Types

- Textual Types
- Short Text (Formerly known as “Text”)
 - Alphanumeric data (names, titles, addresses, etc)
 - Allows up to 255 characters
- Long Text (Formerly knows as “Memo”)
 - Large amounts of alphanumeric data
 - Sentences and paragraphs
 - Allows up to about 1 gigabyte (GB), but controls to display a long text are limited to the first 64,000 characters.

Data Types

- Number
 - Allows numeric data only
 - Size allows for 1, 2, 4, 8, or 16 byte numbers.
- Currency
 - Monetary Data, stores with 4 decimal places of precision
 - Allows up to 8 byte values
- Auto Number
 - Unique value generated by Access for each new record
 - Allows up to a 4 byte value

Data Types

- Date / Time
 - This data type allows you to enter Dates and/or Times
 - Allows up to an 8 byte value
- Yes/No
 - Boolean (True/False) Data
 - Access stores the numeric value zero (0) for false, and -1 for true
 - Data size is 1 byte
- OLE Object
 - Pictures, graphs, or other ActiveX objects from another Windows-based application
 - Can store up to about 2 GBs

Data Types

- Hyperlink
 - A link address to a document or file on the internet, on an intranet, on a local area network (LAN), or on your local computer
 - Size – up to 8,192 (each part of a Hyperlink data type can contain up to 2048 characters)
- 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.
 - Note, the Attachment data type isn't available in MDB file formats
 - Size allowed is up to about 2GBs

Data Types

- Calculated
 - You can create an expression that uses data from one or more fields.
 - You can designate different result data types from the expression.
 - The calculated data type isn't available in .MDB file formats
 - Size is dependent on the data type of the result type property.
 - Short text data type result can have up to 243 characters.
 - Long text, Number, Yes/No, and Date/Time should match their perspective data types

Relationships

- In a relational database, relationships enable you to prevent redundant data.
- The best solution is to store subject specific information in multiple tables.
 - A table for authors (authorID, author name) and a table for books (bookID, authorID bookName)
- The information can be access and joined through the use of a primary key and a foreign key.
- To make sure that your data stays synchronized, you can enforce referential integrity between tables.
- Referential integrity relationships help make sure that information in one table matches information in another.
- Logical relationships in a database enable you to efficiently query data and create reports.

One-to-Many Relationship

- A one-to-many relationship is the most common kind of relationship.
- In this kind of relationship, a row in table A can have many matching rows in table B.
- But a row in table B can have only one matching row in table A.
- For example, the "Publishers" and "Titles" tables have a one-to-many relationship. That is, each publisher produces many titles. But each title comes from only one publisher.
- A one-to-many relationship is created if only one of the related columns is a primary key or has a unique constraint.
- In the relationship window in Access, the primary key side of a one-to-many relationship is denoted by a number 1. The foreign key side of a relationship is denoted by an infinity symbol.



Relationships

Inventory Transactio...



ID

Type Name

1



Inventory Transactio...



Transaction ID

Transaction Typ

Transaction Cre

Transaction Mo

Product ID

Quantity

One-to-One Relationship

- This isn't a common relationship type but can be used if you need to split a table that contains many fields into two tables.
- A one-to-one relationship connects one record in the parent table to one record in the child table
- The field that you plan on creating your relationship with should be the primary key in the parent table, and the child table. The name does not have to be exactly the same, but they do need to be of the same type (number, short text, etc).
 - Employees table – empID
 - EmployeeInfo – empID
 - OR
 - Employees table – employeeID
 - EmployeeInfo - empID

- Queries are far more powerful than the simple searches or filters you might use to find data within a table.
- This is because queries can draw their information from **multiple** tables.
- For example, while you could use a **search** in the customers table to find the name of one customer at your business or a **filter** on the orders table to view only orders placed within the past week, neither would let you view both customers and orders at once.
- However, you could easily run a **query** to find the name and phone number of every customer who's made a purchase within the past week.
- A well-designed query can give information you might not be able to find out just by examining the data in your tables.

Wildcards

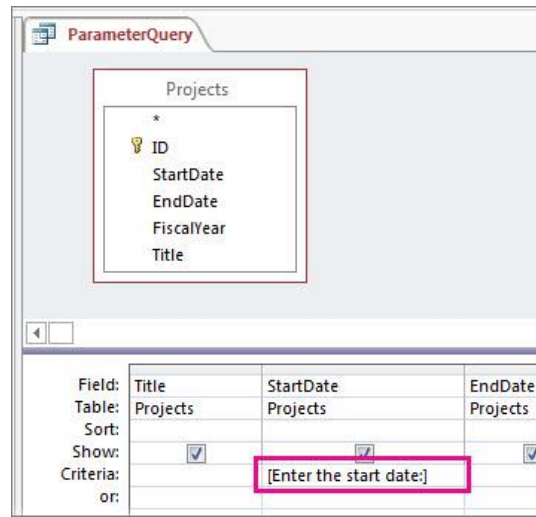
- Wildcards can be used when you run select, update, and delete queries.
 - Asterisk *
 - Matches any number of characters, and can be used anywhere in a character string
 - Wh* finds what, white, and why, but not a awhile or watch
 - Question Mark ?
 - Matches any single alphanumeric character
 - B?ll finds ball, bell, and bill
 - Hashtag #
 - Matches any single numeric character
 - 1#3 finds 103, 113, and 123

Greater Than / Less Than

- Can be used in select, update, and delete queries
- Used to specify values that are greater/less than a specific value
 - Greater than >
 - Shows values that are greater than value on the right side
 - > 100 will return values that are greater than 100 (101, 110)
 - >= 100 will return values that are greater than or equal to 100 (100, 101, 110)
 - Less than <
 - Shows values that are less than value on the right side
 - < 100 will return values that are less than 100 (99, 90, 82)
 - <= 100 will return values that are less than or equal to 100 (100, 99, 90)

Query Parameter

- Creating a parameter is similar to adding a normal criterion to a query.
- Create a select query, and then open the query in Design view.
- In the **Criteria** row of the field you want to apply a parameter to, enter the text that you want to display in the parameter box, enclosed in square brackets. For example, **[Enter the start date:]**



Forms and Subforms

- While you can always enter data directly into database tables, you might find it easier to use **forms**.
- Forms ensure you're entering the right data in the right location and format. This can help keep your database accurate and consistent.
- The use of forms ensures that all the data entered goes exactly where it's supposed to go: into one or more related tables.
- While entering data into simple tables is fairly straightforward, data entry becomes more complicated as you start populating tables with records from elsewhere in the database.

Forms and Subforms

- If you created a form from a table whose records are linked to another table, your form probably includes a **subform**.
- A subform is a **datasheet form** that displays linked records in a table-like format.
- For instance, the subform included in the **Customers** form we just created displays linked customer **orders**.
- Depending on the content and source of your form, you might find that the subform contains useful information

Forms and Subforms

New Order

Customer

Whitman

Order #

5

Pickup Date

12/4/13

Notes

☐ Pre Order
☒ Paid

Add Item

Category	Product	Quantity	"Unit"	Price	Subtotal
Cookies	Chocolate Chip	2	Single	\$1.50	\$3.00
Cookies	Fudge Brownie	1	Single	\$2.00	\$2.00
Cookies	Ginger Shortbread	1	Half-Dozen	\$10.50	\$10.50
Pastries	Brownies	1	One Dozen	\$19.00	\$19.00
Cakes	Black Forest	5	Single	\$22.00	\$110.00
Cakes	Coconut	2	Single	\$22.00	\$44.00
Cakes	Carrot Cake	1	Single	\$22.00	\$22.00

Reports and Subreports

- A subreport is a report that is inserted in another report.
- When you combine reports, one of them must serve as the main report that contains the other report.
- A main report is either *bound* or *unbound*.
- A bound report is one that can display data and has a table, query, or SQL statement specified in its **Record Source** property.
- An unbound report is one that is not based on a table, query, or SQL statement (that is, the **Record Source** property of the report is empty).

Reports and Subreports

1

01/01/0000

Employee Sales:	Employee Name:	Employee Sales:
	00000 00000	\$93,932
	0000 00000	\$88,123
	000000 0000	\$123,129

2

Category Sales:	Category Name:	Category Sales:
	00000	\$127,189
	00000	\$56,462
	00000	\$88,500

3

01/01/0000

1

Summary

Quarter:	Orders:	Sales:
1	91	\$142,758
2	90	\$140,645
3	108	\$147,028
4	108	\$176,567
Totals:	397	\$606,998

2

Details

Shipped Date:	Order ID:	Sales:
03-Jan	10396	\$1,903
05-Jan	10399	\$1,765
	10404	\$1,591

Grouping and Sorting

- Information is often easier to understand when it is divided into groups.
- For example, a report that groups sales by region can highlight trends that otherwise might go unnoticed.
- In addition, placing totals at the end of each group in your report can replace a lot of manual interaction with a calculator.
- Microsoft Office Access makes working with grouped reports easy.
- You can create a basic grouped report by using the Report Wizard, you can add grouping and sorting to an existing report, or you can revise grouping and sorting options that have already been defined.

Product List			
Category	Product Name	ID	List Price
Beverages	Northwind Traders Beer	34	\$14.00
Beverages	Northwind Traders Coffee	43	\$46.00
Beverages	Northwind Traders Chai	1	\$18.00
Condiments	Northwind Traders Syrup	3	\$10.00
Condiments	Northwind Traders Cajun Seasc	4	\$22.00
Condiments	Northwind Traders Okra	66	\$17.00



Products by Category		
Category	Product Name	List Price
<u>Beverages</u>		
	Northwind Traders Beer	\$14.00
	Northwind Traders Coffee	\$46.00
	Northwind Traders Chai	\$18.00
	Count: 3	
<u>Condiments</u>		
	Northwind Traders Syrup	\$10.00
	Northwind Traders Cajun Seasoning	\$22.00
	Northwind Traders Okra	\$17.00

- You can group on any fields and expressions you sort on.
- You can group on the same field or expression more than once.
- When you group on more than one field or expression, Office Access nests the groups according to their group level.
- The first field you group on is the first and most significant group level; the second field you group on is the next group level; and so on.
- The following illustration shows how Office Access nests the groups.

Sorting

- Right-click any value in the field that you want to sort.
- On the shortcut menu, click the sort option you want. For example, to sort a text field in ascending order, click Sort A to Z
- To sort a numeric field in descending order, click Sort Largest to Smallest

Table Data Validation

- Validation Rules can be set from the Table Design View or Datasheet View

Field Name	Data Type	Description (Optional)
ContractID	Short Text	
StudentID	Short Text	
TeacherID	Short Text	
ContractStartDate	Date/Time	
ContractEndDate	Date/Time	
LessonType	Short Text	
LessonLength	Number	30 or 60 minutes
MonthlyLessonCost	Currency	
MonthlyRentalCost	Currency	Monthly rental charge for instrument

Field Name	Data Type	Description (Optional)
ContractID	Short Text	
StudentID	Short Text	
TeacherID	Short Text	
ContractStartDate	Date/Time	
ContractEndDate	Date/Time	
LessonType	Short Text	
LessonLength	Number	30 or 60 minutes
MonthlyLessonCost	Currency	
MonthlyRentalCost	Currency	Monthly rental charge for instrument

Field Size	4
Format	
Input Mask	
Caption	Contract ID
Default Value	
Validation Rule	
Validation Text	
Required	Yes
Allow Zero Length	Yes
Indexed	Yes (No Duplicates)
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

Contract ID	Student ID	Teacher ID	Contract Start Date	Contract End Date	Lesson Type	Lesson Length	Monthly Lesson Cost	Monthly Rental Cost
3100	CAR7534	13-1100	03/31/2012	03/31/2013	Piano	30	\$200	\$120
3102	MEH7551	63-1554	05/18/2013	05/18/2014	Guitar	30	\$200	\$120
3103	MAK7556	34-4506	06/15/2013	12/15/2013	Violin	30	\$200	\$120
3105	BUR7559	22-0102	04/08/2012	04/08/2013	Cello	30	\$200	\$120
3107	MIL7512	22-0102	06/15/2013	06/15/2014	Piano	30	\$200	\$120
3108	SHA7522	63-1554	06/17/2012	06/17/2013	Guitar	30	\$200	\$120
3110	HIR7521	17-1798	09/09/2012	09/09/2013	Percussion	30	\$200	\$120
3113	YAM7535	91-0178	09/10/2012	09/10/2013	Violin	30	\$200	\$120
3114	MEN7541	70-4490	09/10/2012	09/10/2013	Guitar	30	\$200	\$120
3117	BRA7545	55-5310	03/11/2013	03/11/2014	Voice	30	\$200	\$120

Hiding Duplicates

- When pulling Access data together into a meaningful format, you may find that reports repeat data.
- Depending on how you're using the data, you may or may not want to display those duplicate values.
- Even properly normalized tables won't eliminate duplicates in a report.
- Now, it's normal to display repetitive values on the *many* side of a relationship, but not on the *one* side, as this report does.
- Fortunately, hiding duplicates is just a control property away.
- With the report in Design view, double-click the control that's displaying duplicate values and set the Hide Duplicates property to Yes to hide duplicates.

Hiding Duplicates

Division	Department	Employee ID
Finance	Account	1
Finance	Admin	2
Finance	Admin	3
HR	Admin	4
HR	Payroll	5
IT	Admin	6
Security	Admin	7

Hiding Duplicates

Property Sheet ✕

Selection type: Text Box

Division ▼

Format Data Event Other All

Font Underline	No
Font Italic	No
Fore Color	Text 1, Lighter 25%
Line Spacing	0cm
Is Hyperlink	No
Display As Hyperlink	If Hyperlink
Hyperlink Target	
Gridline Style Top	Transparent
Gridline Style Bottom	Transparent
Gridline Style Left	Transparent
Gridline Style Right	Transparent
Gridline Color	Background 1, Dar
Gridline Width Top	1 pt
Gridline Width Bottom	1 pt
Gridline Width Left	1 pt
Gridline Width Right	1 pt
Top Margin	0.039cm
Bottom Margin	0.039cm
Left Margin	0.078cm
Right Margin	0.078cm
Top Padding	0.053cm
Bottom Padding	0.053cm
Left Padding	0.053cm
Right Padding	0.053cm
Hide Duplicates	Yes ▼
Can Grow	Yes
Can Shrink	Yes

Conditional Formatting

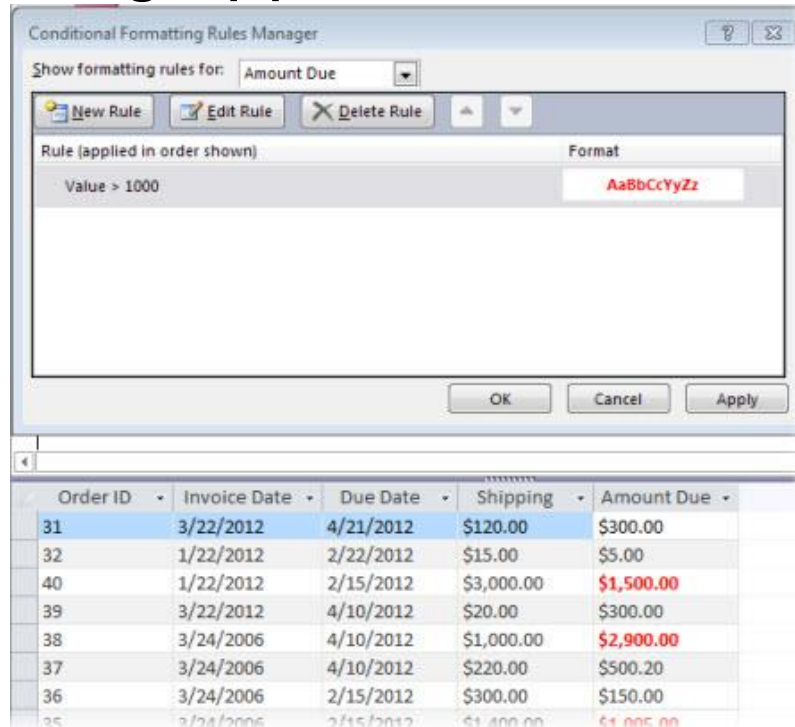
- Data on forms or reports in Access desktop databases can sometimes appear easier to read especially when you highlight the really important areas.
- That's where conditional formatting can help.
- In an Access desktop database, you can set rules to controls so that the values are automatically highlighted.

Conditional Formatting

- Open the form or report in Layout view, and select the control where you want to apply the conditional formatting.
- On the **Format** tab, click **Conditional Formatting**.
- In the **Conditional Formatting Rules Manager** dialog box, click **New Rule** and select a rule type.
- Select an option from **Edit the rule description**.
- Select the formatting that you want to apply and click **OK**.
- To add a new rule to the same field(s), click **New Rule** and repeat this procedure from step 4.

Conditional Formatting

- In the following example, the top portion shows the Conditional Formatting Rules Manager set to show any item with amount due exceeding \$1000 in red text. The portion below shows how the conditional formatting appears.



The screenshot displays the 'Conditional Formatting Rules Manager' dialog box. The 'Show formatting rules for:' dropdown is set to 'Amount Due'. The 'New Rule' button is selected. The rule list shows a rule 'Value > 1000' with the format 'AaBbCcYyZz' (red text). Below the dialog, a table shows the application of this rule to the 'Amount Due' column. Values greater than 1000 are highlighted in red text.

Order ID	Invoice Date	Due Date	Shipping	Amount Due
31	3/22/2012	4/21/2012	\$120.00	\$300.00
32	1/22/2012	2/22/2012	\$15.00	\$5.00
40	1/22/2012	2/15/2012	\$3,000.00	\$1,500.00
39	3/22/2012	4/10/2012	\$20.00	\$300.00
38	3/24/2006	4/10/2012	\$1,000.00	\$2,900.00
37	3/24/2006	4/10/2012	\$220.00	\$500.20
36	3/24/2006	2/15/2012	\$300.00	\$150.00
35	3/24/2006	2/15/2012	\$1,400.00	\$1,005.00

Conditional Formatting

- Example with multiple criteria on a single field

Conditional Formatting

Default Formatting
This format will be used if no conditions are met: AaBbCcYyZz B I U [font color] [background color]

Condition 1
Field Value Is [dropdown] between [dropdown] 100 and 1000
Preview of format to use when condition is true: AaBbCcYyZz B I U [font color] [background color]

Condition 2
Field Value Is [dropdown] greater than [dropdown] 1000
Preview of format to use when condition is true: AaBbCcYyZz B I U [font color] [background color]

Add >> Delete... OK Cancel

Order Details

Order ID	Product	Quantity	Unit Price	Extended
30	Northwind Traders Cake Mix	100	\$14.00	\$1,400.00
30	Northwind Traders Dried Plums	30	\$3.50	\$105.00
31	Northwind Traders Dried Pears	10	\$30.00	\$300.00
31	Northwind Traders Dried Apples	10	\$53.00	\$530.00
31	Northwind Traders Dried Plums	10	\$3.50	\$35.00
32	Northwind Traders Coffee	20	\$46.00	\$920.00
32	Northwind Traders Chai	15	\$18.00	\$270.00
33	Northwind Traders Chocolate Biscuits Mix	30	\$9.20	\$276.00
34	Northwind Traders Chocolate Biscuits Mix	20	\$9.20	\$184.00
35	Northwind Traders Chocolate	10	\$12.75	\$127.50
36	Northwind Traders Clam Chowder	200	\$9.65	\$1,930.00
37	Northwind Traders Curry Sauce	17	\$40.00	\$680.00
38	Northwind Traders Coffee	300	\$46.00	\$13,800.00

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- Information from <http://www.gcflearnfree.org/access2016> and other web resources