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

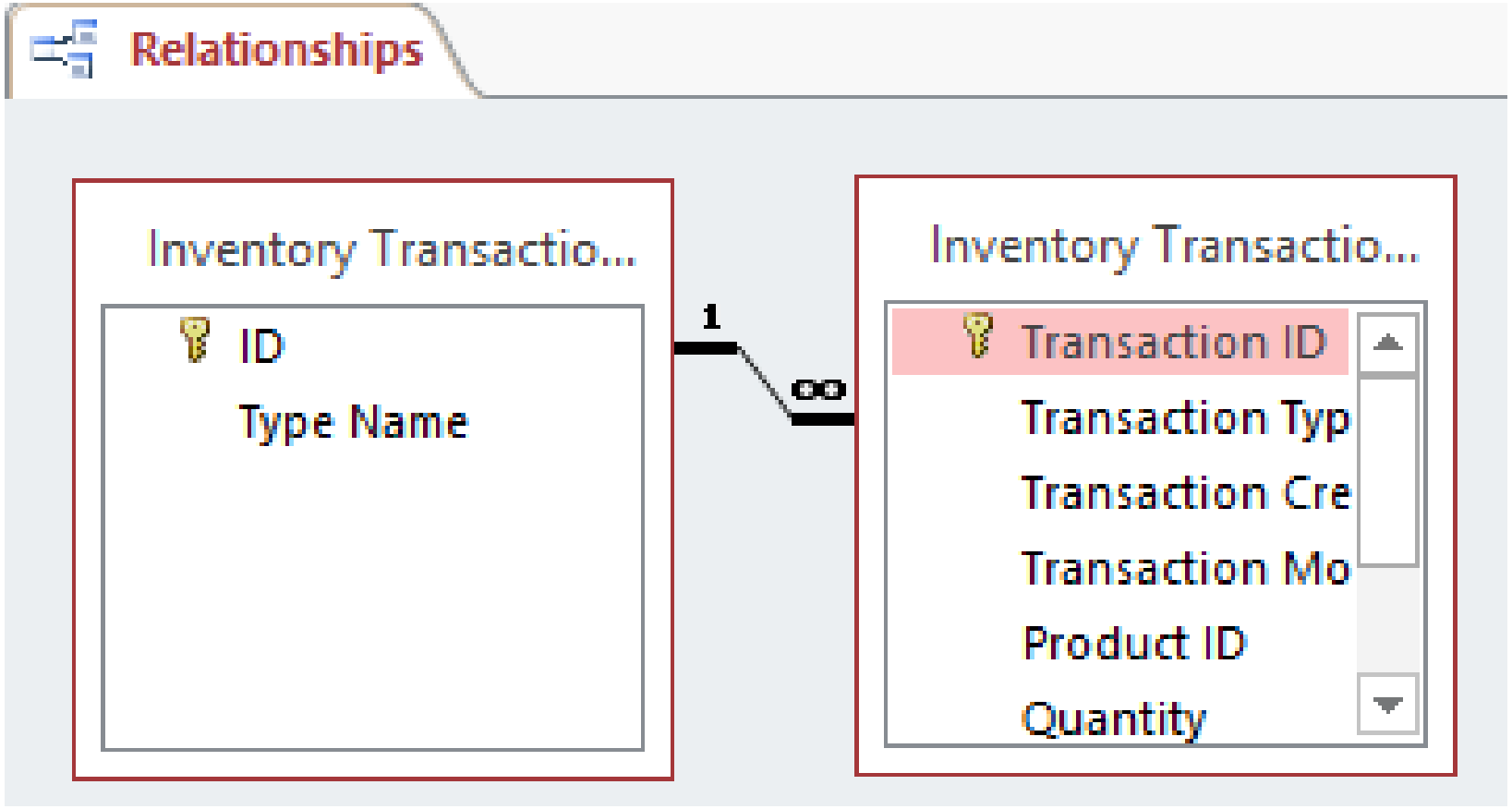
- Calculated
  - You can create an expression that uses data from one or more fields.
  - You can designate different result data types from the expression.
  - The calculated data type isn’t available in .MDB file formats
  - Size is dependent on the data type of the result type property.
    - Short 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
  - EmloyeeInfo - 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

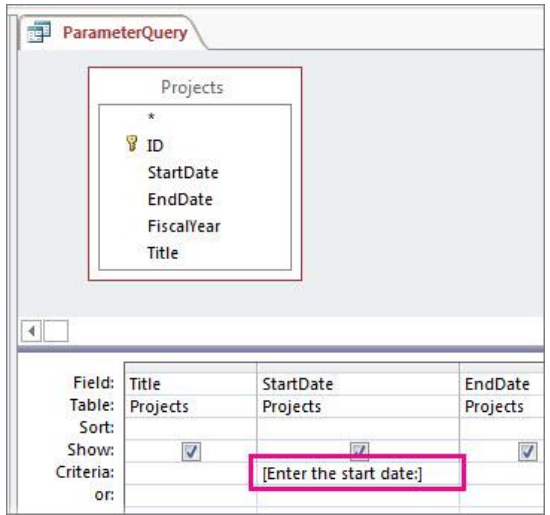
- Wildcards can be used when you run select, update, and delete queries.
  - Asterisk *
    - Matches any number of characters, and can be used anywhere in a character string
      - Wh* finds what, white, and why, but not a awhile or watch
  - Question Mark ?
    - Matches any single alphanumeric character
      - 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:]**



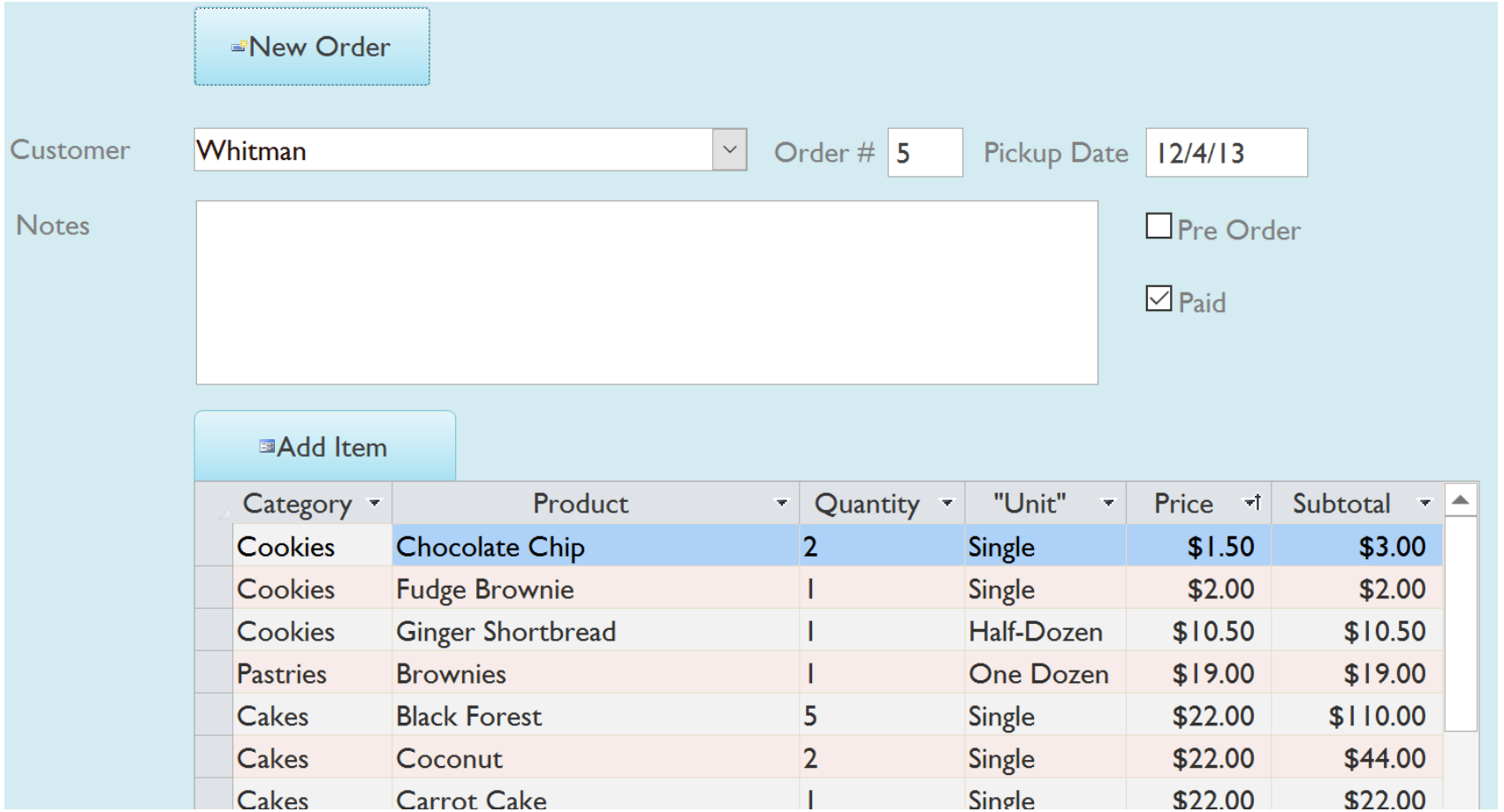
Forms and Subforms

- 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

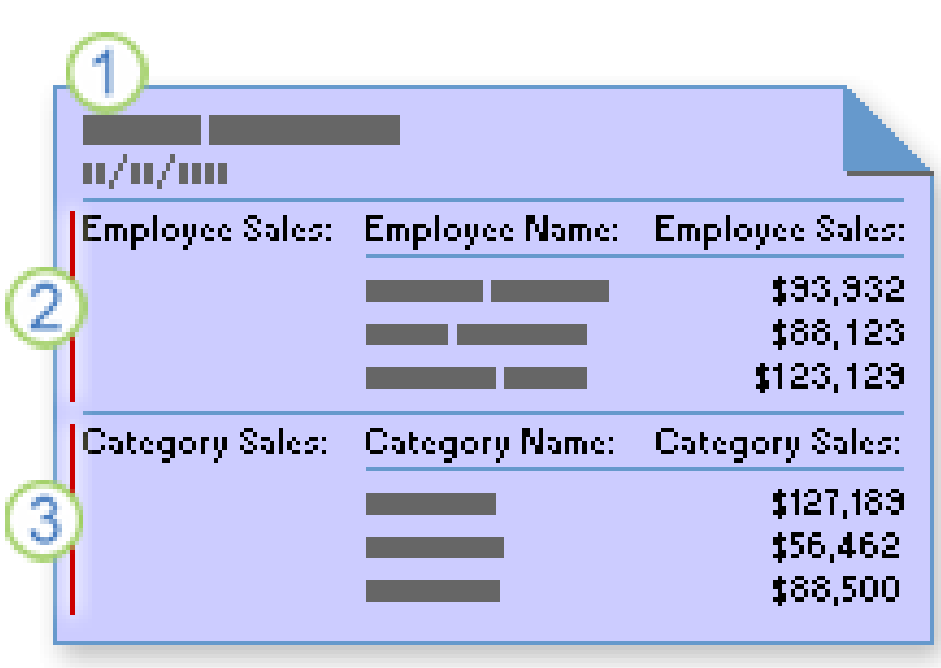
Forms and Subforms



Reports and Subreports

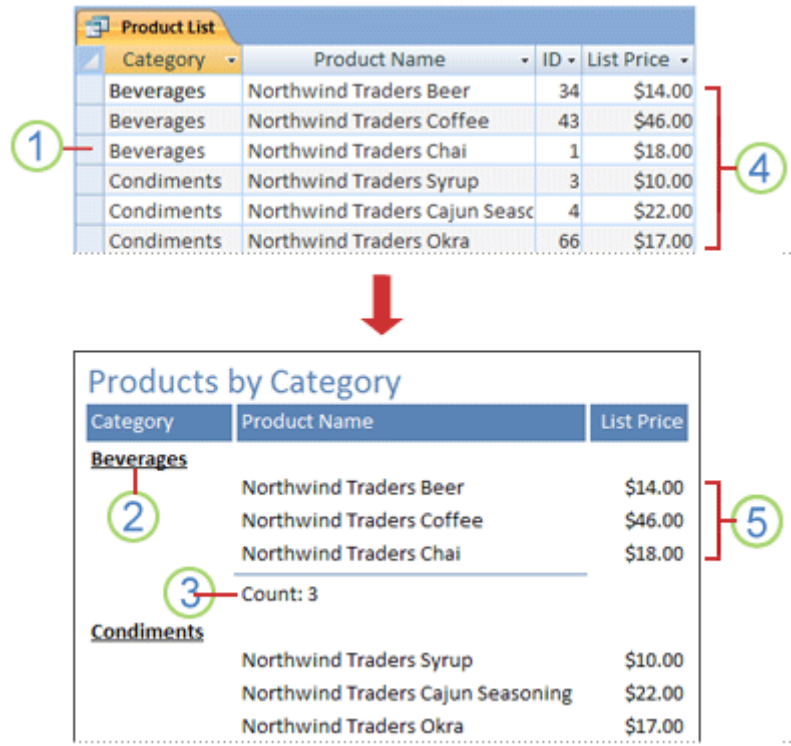
- A subreport is a report that is inserted in another report.
- When you combine reports, one of them must serve as the main report that contains the other report.
- A main report is either *bound* or *unbound*.
- A bound report is one that can display data and has a table, query, or SQL statement specified 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



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
1
4
Products by Category
Category
Product Name
List Price
Beverages
Northwind Traders Beer
$14.00
Northwind Traders Coffee
$46.00
Northwind Traders Chai
$18.00
2
3
Count: 3
5
Condiments
Northwind Traders Syrup
$10.00
Northwind Traders Cajun Seasoning
$22.00
Northwind Traders Okra
$17.00

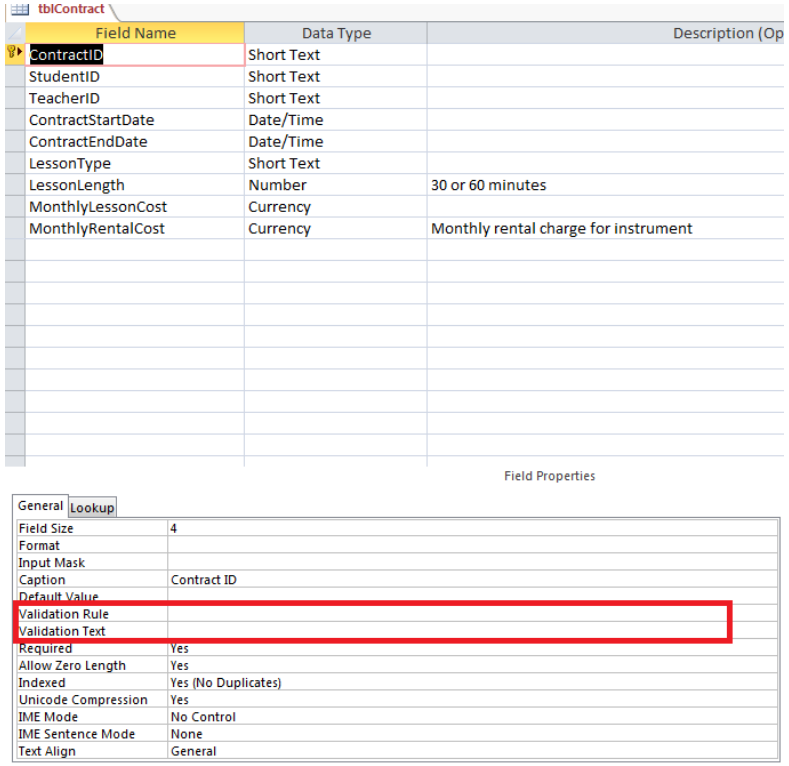
- You can group on any fields and expressions you sort on.
- You can group on the same field or expression more than once.
- When you group on more than one field or expression, Office Access nests the groups according to their group level.
- The first field you group on is the first and most significant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

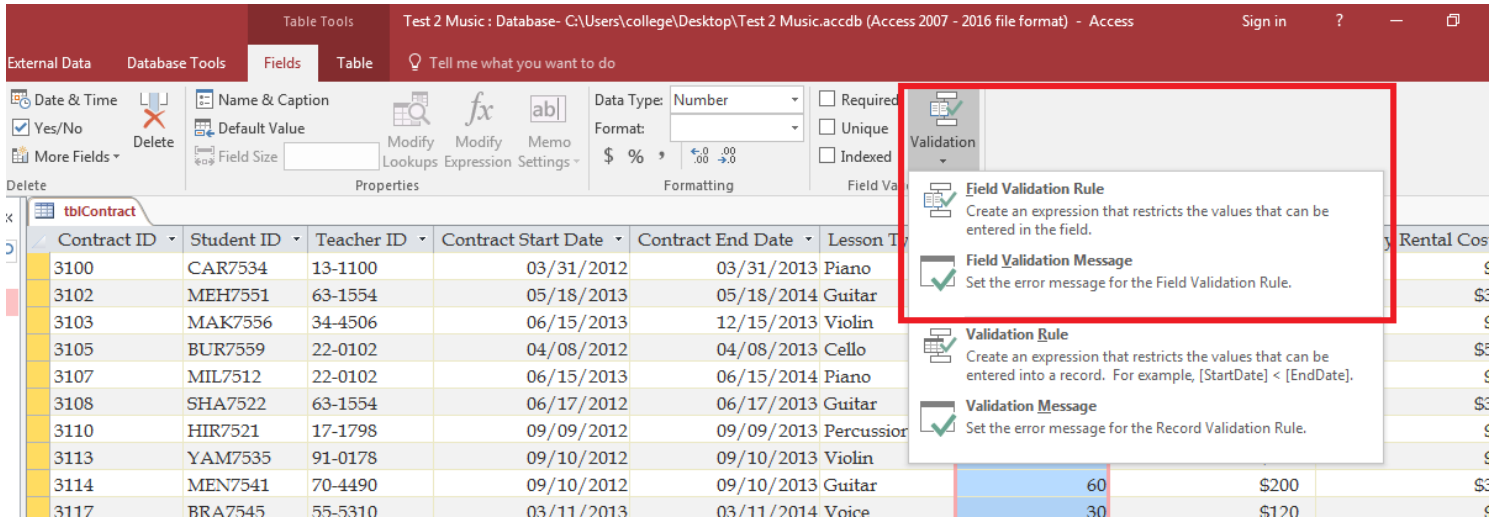
Sorting

- 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





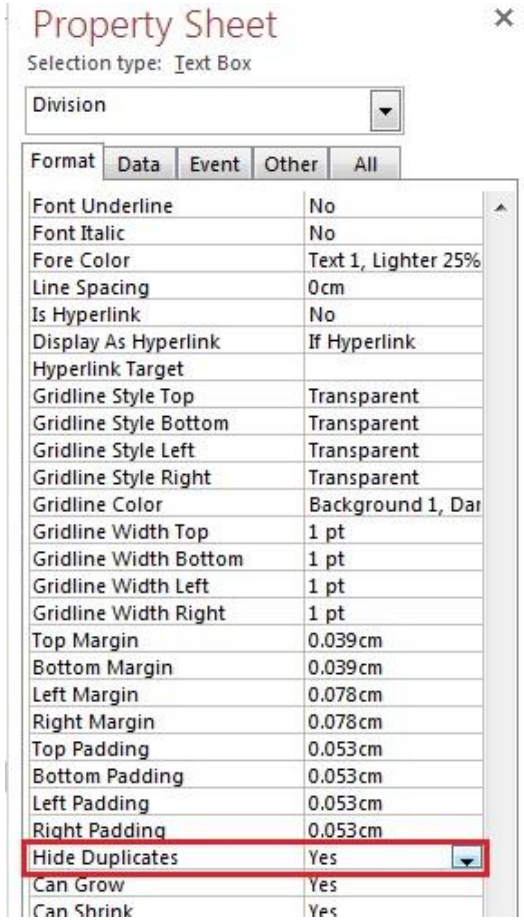
Hiding Duplicates

- 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



Conditional Formatting

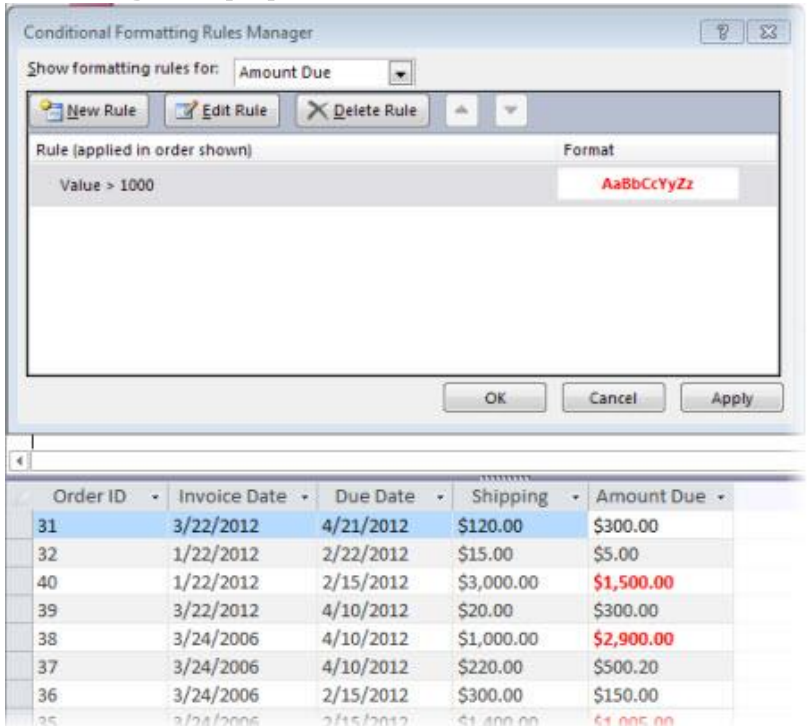
- Data on forms or reports in Access desktop databases can sometimes appear easier to read especially when you highlight the really important areas.
- That’s where conditional formatting can help.
- In an Access desktop database, you can set rules to controls so that the values are automatically highlighted.

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

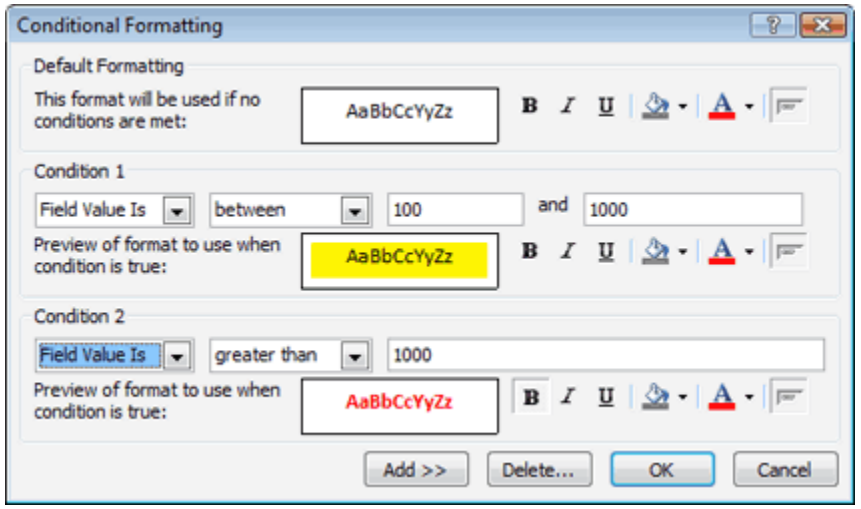
- In the following example, the top portion shows the Conditional Formatting Rules Manager set to show any item with amount due exceeding $1000 in red text. The portion below shows how the conditional formatting appears.



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

Conditional Formatting

- Example with multiple criteria on a single field



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