ACC575: Data Analytics for Accounting

LN5: Linking Tables

Jaeyoon Yu, Ph.D.
Central Michigan University

October 22, 2025

Table of Contents

Learning Objectives

Understand the following concepts using examples:

- vlookup()
- Trial Balance.
- Journal entries to Pivot table.
- Pivot table.
- Calculated fields in Pivot table.

*Maximize the use of **keyboard shortcuts** rather than relying on **mouse clicks**.

Basic accounting concepts

Trial Balance

A list of all accounts with their balances, used to check the accuracy of the accounting records.

Relational database

Relational database:

- includes a set of tables that are related to each other.
- Examples with 3 tables:
  1. Transaction data (10,000 rows)
  2. Products (3 rows: Labtop, Monitor, Keyboard)
  3. Customers (10 rows: Walmart, Target, Macy's.)
- Examples in class:
  1. Lab4-3 (with two supplementary tables)
  2. Lab4-2 (with one supplementary table)

Relational database in Excel:

- Excel can also be used as a relational database.
- vlookup() and xlookup() are used to link two tables.
- See Lab 4-3.

Ex. Linking two tables [Lab4-2]

Lab2-2: State sales tax

Purpose: Calculate sales tax owed for each transaction.

1. Using vlookup(), bring state sales tax rate to the data.
2. Calculate sales tax owed for each transaction.
3. Using pivot table, calculate sales tax by state. Sort by sales tax in descending order. Format it properly

Data Preview

	A	B	C	D	E	F	I	J	K
1	Sales_Order_ID	Sales_Order_Dat	Sales_Order_Qua	product_descript	Product_Sale_Pri	Store_Location		state	State Sales Tax
2	20001	11/1/2024	10	Pale Ale	4.75	KS		AL	0.04
3	20005	11/1/2024	8	Pale Ale	4.75	TN		AK	0
4	20017	11/7/2024	1	Pale Ale	4.75	TX		AZ	0.056

Note: There are two datasets - 1) **Main data** and 2) **State tax rates**.

1. Using vlookup(), bring state sales tax rate to the data.

How?

1. Column header - State Sales Tax.
2. Cell G2: =vlookup(arg1, arg2, arg3, arg4).
    1. arg1 - state of the transaction.
    2. arg2 - state-level tax data (range of cells).
    3. arg3 - the location of the column to be returned: **2nd column for tax rate**.
    4. arg4 - Exact match or not? **0 for exact match**.

F	G	H	I	J	K
Store_Location	State Sales Tax			state	State Sales Tax
KS	=VLOOKUP(			AL	0.04
TN	[@[Store_Location]],			AK	0
TX	State_Sales_Tax,2,FALSE)			AZ	0.056

2. Calculate sales tax owed for each transaction.

How?

1. Column header in H: State_Sales_Tax_Owed.
2. Cell H2: `=Price * Quantity * State Sales Tax Rate`

F	G	H
ocation	State Sales Tax	State_Sales_Tax_Owe
	0.065	3.09
	0.07	2.66
	0.0625	0.30

3. Using pivot table, calculate sales tax by state. Sort by sales tax in descending order. Format it properly.

How?

1. Insert > PivotTable.
2. Move `State` to Row Labels.
3. Move `State_Sales_Tax_Owed` to Values.
4. Make sure `Sum` is selected for the Values field.
5. Sort by `State_Sales_Tax_Owed` in descending order.
6. Format the numbers to two decimal places.

M	N
Row Labels	**Sum of State_Sales_Tax_Owed**
TX	64.2
AR	45.7
KS	30.7
OK	30.1
MO	27.7
NE	25.6
IA	24.6
TN	15.3

Ex. Linking two tables[Lab4-3]

Lab2-2: Gross margin by customers

Purpose:

1. Bring *Product_Description* column to the main data using vlookup().
2. Make a pivot table *Sales_Order_Quantity_Sold* by *Product_Description*.

Data Preview – Main data

	A	B	C	D	E	F	G
1	Sales_Order_ID	Sales_Order_Date	Sales_Employee_ID	Customer_ID	Product_Code	Sales_Order_Quantity_Sold	Product_Sale_Price
2	20062	11/22/2024	1007	2001	2004	12	105
3	20168	12/27/2024	1007	2001	2005	8	85
4	20383	3/4/2025	1007	2001	2004	5	105
5	20564	4/28/2025	1007	2001	2002	6	120
6	20140	12/20/2024	1006	2002	2001	5	95
7	20310	2/11/2025	1007	2002	2004	2	105

Data Preview – Customers

	A	B	C	D	E	F
1	Customer_I	Business_Nam	Customer_Addre	Customer_Ci	Customer_S	Customer_Zi
2	2001	Beverage Distributors	3221 SE 14th Street	Des Moines	IA	50320
3	2002	Deep Ellum Brewing Company	2823 St Louis Street	Dallas	TX	75226
4	2003	Schatz Distributing Co.	3140 S. 28th Steet	Kansas City	KS	66106

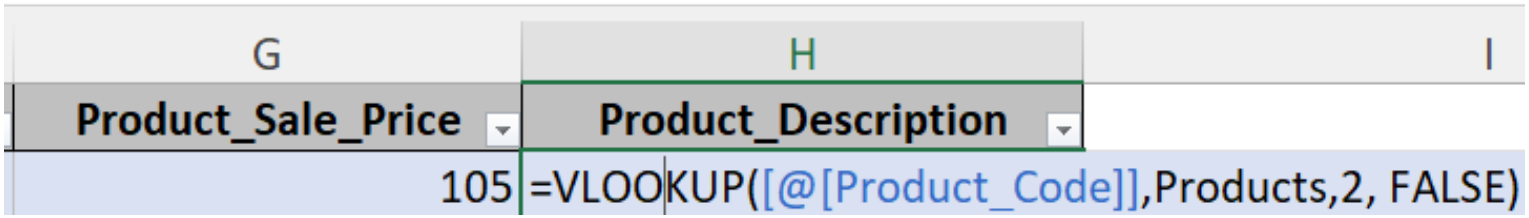
Data Preview – Products

	A	B	C
1	Product_Cod	Product_Descriptic	Product_Sale_Pri
2	2001	Pale Ale	95
3	2002	Imperial IPA	120
4	2003	IPA	100
5	2004	Imperial Stout	105
6	2005	Stout	85
7	2006	Wheat	90
8			

1. Bring *Product_Description* column to the main data using vlookup().

How?

1. Column header - Product_Description.
2. Cell H2: =vlookup(arg1, arg2, arg3, arg4).
   1. arg1 - Choose product code in the row 2 (move with keyboard).
   2. arg2 - Go to the spreadsheet named Products; Select the product data. **"@[Product_Code]"** will be shown in the formula bar.
   3. arg3 - **2nd column for Product_Description**. **"Products"** will be shown in the formula bar.
   4. arg4 - Exact match or not? 0 for **exact match**.



2. Make a pivot table *Sales_Order_Quantity_Sold* by *Product_Description*.

How?

1. Insert > PivotTable.
2. Move *Product_Description* to Row Labels.
3. Move *Sales_Order_Quantity_Sold* to Values.
4. Sort by *Sales_Order_Quantity_Sold* in descending order.

J	K
Row Labels	**Sum of Sales_Order_Quantity_Sold**
Imperial Stout	258
IPA	235
Stout	190
Wheat	119
Pale Ale	116
Imperial IPA	61
Grand Total	**979**

Ex. Journal entries to Trial Balance [Lab1-1]

Lab1-1: Journal entries to Trial Balance

Purpose:

1. Apply Pivot Table to calculate the total of Debit and Credit for each account.
2. Apply Pivot Table to generate a trial balance (i.e., including net balances for each account).

Data Preview

	A	B	C	D	E	F	G
1	Date	JE#	Account Name	Debit	Credit	Entered	Approved
2	1/3/2025	1	Cash	50,000		VR	AC
3	1/3/2025	1	Common Stock		50,000	VR	AC
4	1/3/2025	2	Travel Expense	250		VR	AC
5	1/3/2025	2	Cash		250	VR	AC

1. Apply Pivot Table to calculate the total of Debit and Credit for each account.

How?

1. Insert $>$ PivotTable.
2. Move *Account* to Row Labels.
3. Move *Debit* and *Credit* to Values.

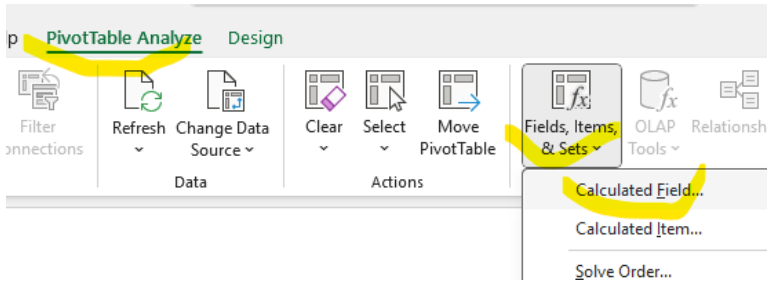
I	J	K
Row Labels	**Sum of Debit**	**Sum of Credit**
Accounts Receivable	46200	24000
Accumulated Depreciation		1000
Allowance for Doubtful Accounts		6000
Bad Debt Expense	6000	
Building	32000	
Cash	134600	90372
Common Stock		50000
Computer Supplies	800	
Depreciation Expense	1000	
Equipment	19300	
Insurance Expense	1400	
Misc. Expense	175	
Notes Payable	4000	31300
Payroll Tax Expense	4400	
Prepaid Insurance		200
Rent Expense	7000	
Repairs Expense	7000	
Salaries Expense	20800	
Service Revenue		94800
Supplies	400	255
Supplies Expense	255	
Training Expense	1800	
Travel Expense	7897	
Utilities Expense	2900	
Grand Total	**297927**	**297927**

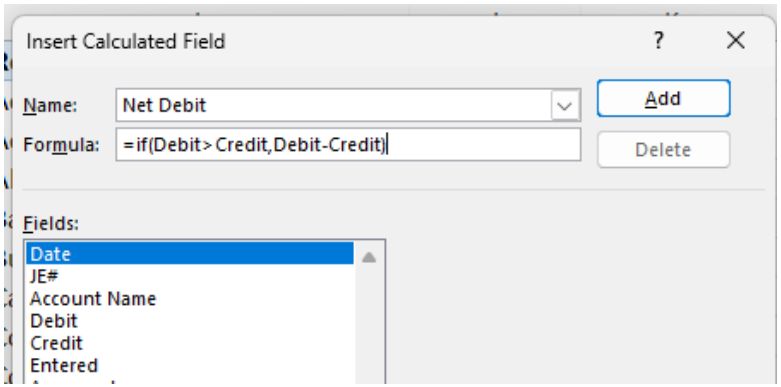
What's wrong with the pivot table?

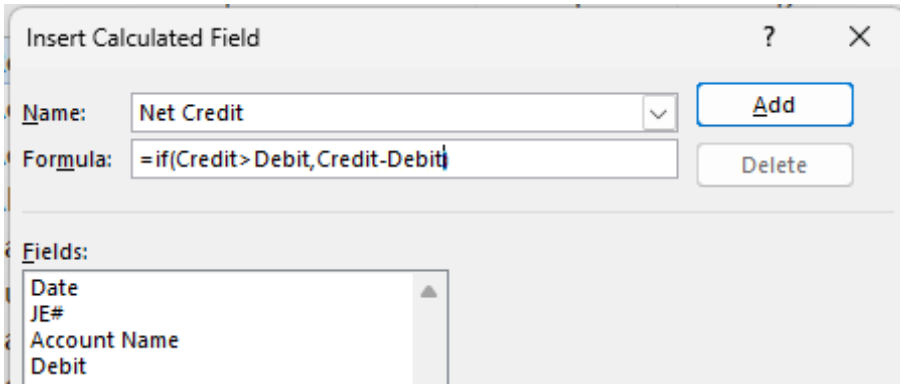
2. Apply Pivot Table to generate a trial balance (i.e., including net balances for each account).

How?

1. Insert > PivotTable.
2. PivotTable Analyze > Fields, Items, & Sets > Calculated Field.
3. Add "Net Debit". Have the conditional formula as below.
4. Add "Net Credit". Have the conditional formula as below.





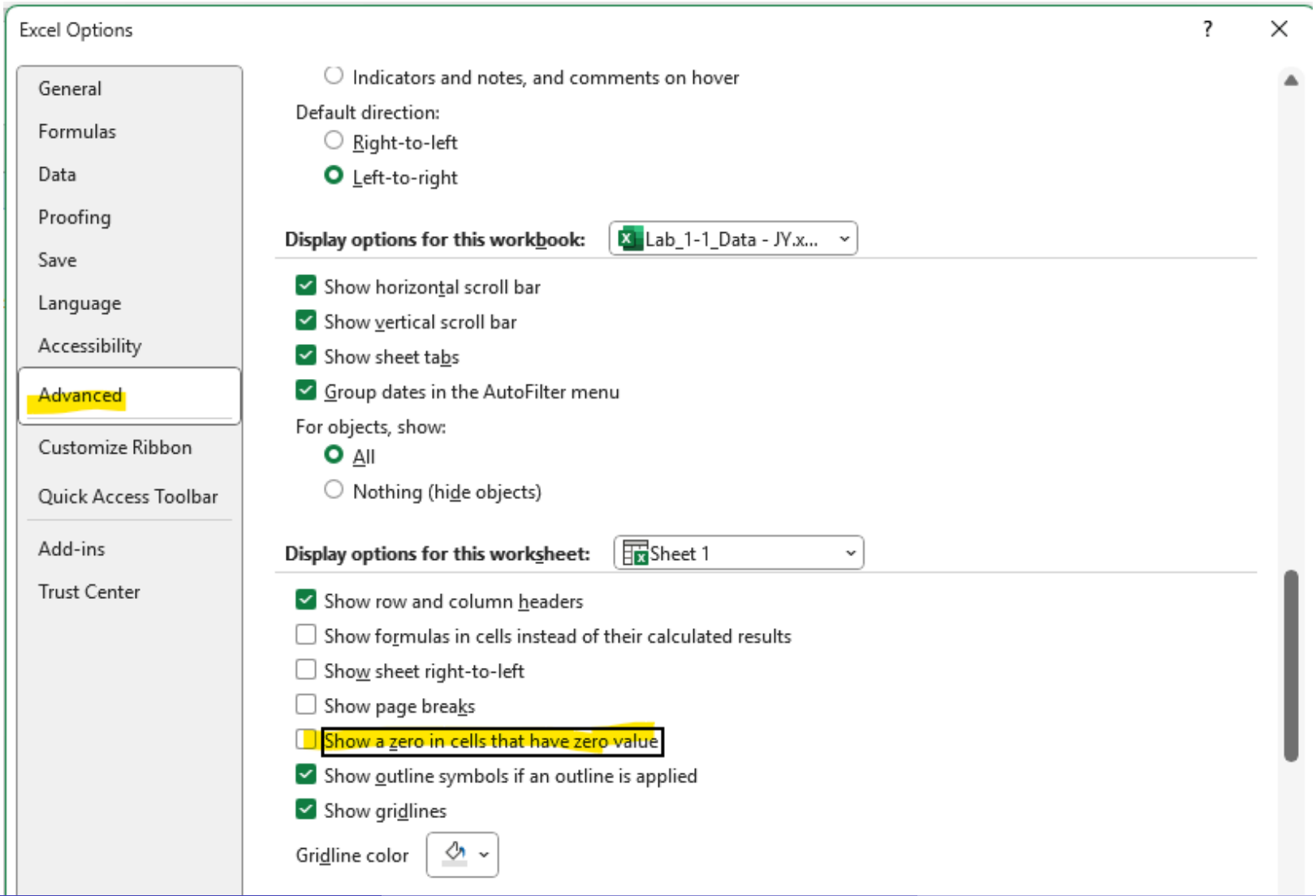


M	N	O
Row Labels	**Sum of Net Debit**	**Sum of Net Credit**
Accounts Receivable	22200	0
Accumulated Depreciation	0	1000
Allowance for Doubtful Accounts	0	6000
Bad Debt Expense	6000	0
Building	32000	0
Cash	44228	0
Common Stock	0	50000
Computer Supplies	800	0
Depreciation Expense	1000	0
Equipment	19300	0
Insurance Expense	1400	0
Misc. Expense	175	0
Notes Payable	0	27300
Payroll Tax Expense	4400	0
Prepaid Insurance	0	200
Rent Expense	7000	0
Repairs Expense	7000	0
Salaries Expense	20800	0
Service Revenue	0	94800
Supplies	145	0
Supplies Expense	255	0
Training Expense	1800	0
Travel Expense	7897	0
Utilities Expense	2900	0
Grand Total	**0**	**0**

To convert 0 to blank, we need to set the zero option to blank.

How?

1. File > Options (at the bottom left) > Advanced
2. Uncheck "Show a zero in cells that have zero value".



M	N	O
Row Labels	**Sum of Net Debit**	**Sum of Net Credit**
Accounts Receivable	22200	
Accumulated Depreciation		1000
Allowance for Doubtful Accounts		6000
Bad Debt Expense	6000	
Building	32000	
Cash	44228	
Common Stock		50000
Computer Supplies	800	
Depreciation Expense	1000	
Equipment	19300	
Insurance Expense	1400	
Misc. Expense	175	
Notes Payable		27300
Payroll Tax Expense	4400	
Prepaid Insurance		200
Rent Expense	7000	
Repairs Expense	7000	
Salaries Expense	20800	
Service Revenue		94800
Supplies	145	
Supplies Expense	255	
Training Expense	1800	
Travel Expense	7897	
Utilities Expense	2900	
Grand Total		

What's wrong with the pivot table?

- Net Debit and Net Credit are not calculated correctly.
- Grand Total is supposed to have sum of Net Debit and Net Credit.
- Accounts need to be sorted. Balance sheet accounts are at the top.

To fix the issues, we need to copy "values" from the pivot table.

How?

1. Select the pivot table.
2. Copy the pivot table.
3. Paste Special $>$ Values.
4. Then work on the pasted table to fix the issues.