

Power Pivot is the best thing to happen to Excel in 20 years. — Bill Jelen, AKA "Mr. Excel"

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### Agenda

- Review: Macros
- Databases in Excel / Relational Tables
- Linking Tables
  - VLOOKUP, INDEX/MATCH, Get & Transform
- The Data Model in Excel
- Use Power Pivot to avoid VLOOKUP
- Review

• In a workbook, or Power Pivot Intro

On your PC

Can be stored:

Macros: Review

Short for: Macro Instruction

Can be recorded and played back

Can automate text entry or formatting

• Can be started by command buttons

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### Macros: VBA

- Are written with Visual Basic for Applications
- Can use VBA to do complicated tasks
- More info on VBA: June 24

**DATABASES IN EXCEL** 

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# Simple Spreadsheets

- Small amount of data
- Only one worksheet is needed
- All data is stored on the report

# Larger Spreadsheets

- Too much data to fit on the report
- Two or more worksheets needed
- Report shows a summary of data
- Data & Reports on a separate sheets

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### Excel's Database Tools

- Sort
- Filter
- Find

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- Subtotal
- Pivot Table
- And one more...

### Is There a Better Way?

• Instead of one large table...

...Divide data into several tables

### The "Flat File" Database

- Data is in a single table
- Advantages:
- Simple
- Problems:

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- Lots of redundant duplicate data
- Wastes storage space
- Increases likelihood of discrepancies

What Are the Advantages?

- Data divided logically into two or more tables
- Data is better organized
- Less duplication
- Less storage needed

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### How Are the Tables Linked?

- The Tables are Related
- Linked by a common column
- Called the "key"

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# Simple Database Example

- We are working for a small school
- Need database for children & parents





### **Relational Databases**

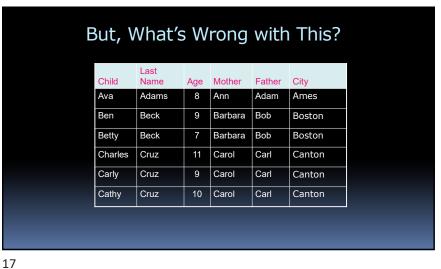
- 2 or more tables linked together
- Design used by most large databases
  - Oracle
  - SQL Server
  - Microsoft Access

### Flat File: A Table of Children

Child	Last Name	Age	Mother	Father	City
Ava	Adams	8	Ann	Adam	Ames
Ben	Beck	9	Barbara	Bob	Boston
Betty	Beck	7	Barbara	Bob	Boston
Charles	Cruz	11	Carol	Carl	Canton
Carly	Cruz	9	Carol	Carl	Canton
Cathy	Cruz	10	Carol	Carl	Canton

One record (row) for each child

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Duplicate, Redundant Data Last Child Name Age Mother Father City Ava Adams Ann Adam Ames 9 Ben Barbara Boston Betty Beck Barbara Bob Boston Charles Cruz Carol Carl Canton Carly 9 Cruz Carol Carl Canton Cathy Cruz Carl Canton Carol Wastes space; Wastes time; Possible errors

### The Problems with Duplicate Data

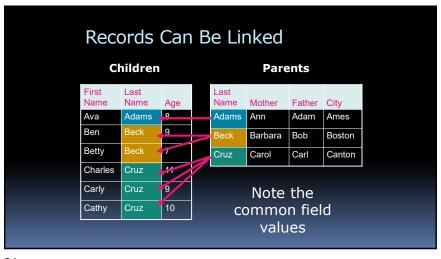
- It wastes data storage space
- It lowers productivity
  - Have to type same data over and over
- It increases risk of errors
  - The more your type, the more errors

Solution: Separate Tables Children **Parents** First Last Last Name Name Mother Father City Ava Adams Adams Ames Ann Adam Beck Ben Barbara Bob Boston Betty Cruz Carol Carl Canton Charles Cruz Note: Fewer cells Cruz Cathy

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Relational Databases
Two or more tables
Different terminology

Rows are called Records
Columns are called Fields

Tables have a common field

Called the "key"

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The Problem of Separated Data

• That which you separate ...
... You will later have to re-combine

Combining Data in Excel

5 Ways to Merge Separate Tables:

1. VLOOKUP

2. INDEX/MATCH

3. Get & Transform Merge

4. A new simple technique

5. A really powerful new technique

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A New Way to Merge Tables

The Excel Data Model

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# The Excel Data Model Added in Excel 2013 Enables links between tables Available in Pivot Tables

The Data Model: Advantages

- Can link tables
- Handles millions of rows of data
- "Easier, faster than VLOOKUP"
- Powerful new functions
  - E.g., Distinct Counts

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### The Excel Data Model

Two Approaches:

- Excel
- Power Pivot

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### **Power Pivot**

- Runs on the Power Pivot Engine

Create a Data Model in Excel:

### Procedure:

- 1. Convert data into Excel Tables
- Use the Format as Table tool
- 2. Use one table to create a Pivot Table Click check box: Add to Data Model
- 3. Field List: All (instead of Active)
- 4. Choose a field from each table
- 5. Create a relationship: Auto-Detect



- Formerly an extra-cost option
- Now a free add-in for Excel 2016
- Also known as the Data Model

PowerPivot Advantages

- Can import data from multiple sources
- Millions of rows
- Create table relationships visually
- Can create Key Performance Indicators
- DAX calculations

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# Power Pivot Disadvantages Cannot edit individual cell data Cannot use VBA to automate tasks

Power Pivot Resources

Mike Girvin (ExcelIsFun)
Power Pivot Intro
https://www.youtube.com/watch?v=yjASjwJCIxA

Leila Gharani (#MsExcel)
Great Excel Power Query, Power Pivot & Power BI Resources
https://www.youtube.com/watch?v=1YoniIrPSAA

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Review of Advanced Excel

1. 50 Tips and Tricks
2. Pivot Tables and VLOOKUP
3. Charts & Advanced Formulas
4. Excel Tables
5. Power Query
6. Dashboards
7. Macros
8. Power Pivot

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