



# Spreadsheet Basics

Working with numbers

# What is a Spreadsheet

- ❖ Electronic version of the old paper accounting spreadsheets
- ❖ A spreadsheet is a grid of columns and rows which is used primarily for numerical calculations, but also may be used as a data management tool

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

# Spreadsheets Features

- ❖ Numbers
- ❖ Text or labels (identifies the numbers )
- ❖ Numeric formulas or equations are created within a spreadsheet
  - Allows for rapid recalculation.
  - What if analysis
- ❖ Graphs
  - Visual display of numbers
- ❖ Data management
  - Organize data & simple data management

# Uses of Spreadsheets

- ❖ **Financial**
  - Budgets, balance sheets, sales forecasting, payroll, taxes, investment proposals, mortgage calculations, and other accounting and financial applications
- ❖ **Scientific**
  - Analyzing and comparing scientific data, tracking changes
- ❖ **Education**
  - Trends in enrollment, student grading, financial aid calculations, tracking courses
- ❖ **Sales**
  - Inventory tracking, sales forecasting, customer trends
- ❖ **Criminal Investigations**
  - tracking crime in areas, looking for trends, analysis of data
- ❖ And many other areas.

# Terms

## Spreadsheet

	A	B	C	D	E
1	Home				
2					
3					
4					
5					
6					
7					
8					
9					

- Row - Horizontal breakdown (numbered)
- Column - Vertical breakdown (lettered)
- Cell - where column & row intersect (referred to by column & row)
- Range - rectangular area
- Worksheets - 3<sup>rd</sup> dimension to spreadsheet

Worksheets

# More Terms

- ❖ **NUMBERS** - Any number entered into a spreadsheet.
- ❖ **VALUE** - Any formula or function or number that yields a numeric value.
- ❖ **TEXT or LABEL** - Characters and/or numbers entered to identify parts of spreadsheet or to add documentation. Or to enter other needed data
- ❖ **FORMULA** - Mathematical or other relationships created between cells. EXAMPLE: =A1+B1 may be a formula in cell C1
- ❖ **FUNCTIONS** - Built-in shortcuts that help the user perform complex computations.
- ❖ **FORMAT** - Style in which values or text appear including:
  - fonts: typefaces, size, bold italic, color
  - numeric styles: currency, percent, e-notation, fixed decimal places, date, time
  - alignment: left, right, justified, centered, centered across columns, vertical placement

## Building formulas

- ❖ Formulas are the backbone of spreadsheets
- ❖ Formulas are similar to equations used in algebra but instead of using letters (x, y, z) for variables we use cell references (A1, A2, A3).
- ❖ All formulas start with an equal sign =
- ❖ Formulas often use mathematical operations

## Symbols used in Formulas

+	Addition
-	Subtraction
*	Multiplication
/	Division
^	Exponentiation
()	Order of operation

If no order is specified, Exponentiation occurs first, followed by multiplication/division and last addition/subtraction.

## Cell References

If the information is elsewhere in the spreadsheet  
NEVER re-type the information. Just

## Refer to Cells

Also consider storing numbers in a separate cell if needed in more than one formula then refer to that cell.

## Example

	A	B
1	Sales	\$ 10,567.00
2	Expenses	\$ 8,452.00
3	Net Income	=B1-B2
4		

The answer to the formula will appear in cell B3 after the formula is entered

## Key Concept

- ❖ The key to building successful formulas and hence successful spreadsheets is to

## Refer to Cells

- ❖ when the information exists in another cell

Code for next software assignment-  
*Refer to cells*

## Formatting

Character Formatting	Number Formatting	Cell Formatting
<ul style="list-style-type: none"> <li>• <b>Bold</b></li> <li>• <i>Italics</i></li> <li>• Fonts</li> <li>• <b>Size</b></li> <li>• Color</li> </ul>	<ul style="list-style-type: none"> <li>• Currency</li> <li>• \$1234.56</li> <li>• Percent</li> <li>• 10%</li> <li>• General</li> <li>• 1234</li> <li>• Fixed Decimal</li> <li>• 12.567</li> <li>• Date</li> <li>• 1/21/2009</li> <li>• Time</li> <li>• 11:00am</li> </ul>	<ul style="list-style-type: none"> <li>• Alignment</li> <li>• Left</li> <li>• Right</li> <li>• Centered</li> <li>• Merge &amp; center</li> <li>• Background color</li> </ul>

## Functions

❖ A **function** is a short cut for a formula or adds additional functionality.

➤ **Sum** - allows us to total a range

↳ To total cells from A3 to A10, use the function  
=sum(A3:A10).

➤ **Maximum** – returns maximum value in range

↳ max(range)

➤ **Minimum** – returns minimum value in range

↳ min(range)

➤ **Average** – returns average value in range

↳ average(range)

## Formulas

❖ Not all formulas need a function

❖ Calculate percentage – divide whole into part.

❖ Do NOT place a normal calculation inside a Sum function

➤ ~~=SUM(C5\*D3/D7)~~ - Incorrect

➤ =C5\*D3/D7 - Correct

❖ Functions can be part of a formula

➤ =sum(A3:A350)/2

## Effective use of Sum function

❖ Use the sum function only when you need to add more than two cells in a range.

❖ Do not add each individual cell - Use the SUM function with a range!

➤ =B2+B3+B4+B5+B6 - Inefficient

➤ =sum(B2,B3,B4,B5,B6) - Inefficient

➤ =sum(B2:B6) Correct!

## Absolute and Relative cell references

❖ When a formula is copied the cell references in the formula change relative to the new location. This is called *relative cell referencing*.

	A	B
1		
2	=A5+C6	=B5+D6
3	=A6+C7	

❖ Sometimes we don't want a cell reference to change when we copy it. *Absolute cell referencing* keeps the cell reference absolutely the same.

➤ represented by \$ in formula and can be achieved by pressing F4 after typing in the cell reference.

	A	B
1		
2	=\$A\$5+C6	=\$A\$5+D6
3	=\$A\$5+C7	

## Using Absolute Referencing

- ❖ Press function key F4 by the cell which needs the absolute reference
- ❖ The dollar signs \$ indicate that cell column and row should remain the same when copied. You can also type them in instead of pressing \$.
- ❖ Example:
  - =E3\*\$E\$5

## Creating a spreadsheet

- ❖ Plan it out!
- ❖ Think about what task you need to accomplish
  - What data needs to be input
  - How should the data be labeled
  - What calculations need to be performed
  - What formulas can best perform those calculations
  - Is there any data needed for formulas that can be stored in a cell for referencing

## Example

- ❖ A company needs to purchase some items. The boss wants to know what the total cost for each item including the taxes on these items. The price, excise tax, and total should be displayed for each item.
- ❖ What data needs to be input
  - List of items
  - Prices for these items
- ❖ How should the data be labeled
  - Item, Price, Excise Tax, Total

## Example (cont)

- ❖ What calculations need to be performed
  - Calculate tax on each item
  - Calculate total price for each item
- ❖ What formulas can best perform those calculations
  - Calculate tax is a multiplication formula
  - Calculate total is an addition formula
- ❖ Is there any data needed for formulas that can be stored in a cell for referencing
  - Excise Tax Rate

## Building Spreadsheet

- ❖ Enter labeling
- ❖ Build the formulas
- ❖ Enter data
- ❖ Copy formulas as needed
- ❖ Format appropriately
- ❖ Update as needed

## Formulas - REFER TO CELLS

- ❖ Most important concept!
- ❖ If data is contained elsewhere in a spreadsheet, do NOT type in the data. Refer to cells!
  - NEVER RETYPE NUMBERS
- ❖ For data used more than one formula, store in a cell.
  - If the amount changes, it is simple to update the changes.

## Formulas - REFER TO CELLS

- ❖ Is relative or absolute referencing needed?
  - Will any of the formulas be copied?
  - What cells need to remain absolutely the same when copied, then use absolute cell reference
- ❖ When referring to cells on another sheet, include the sheet name followed by !
  - Example: Sheet1!C3
- ❖ Code for this lesson "Refer to Cells"

## Using Functions

- ❖ A function can be a shortcut for a more complex formula.
  - For instance: when summing numbers, one could add each cell. =A1+A2+A3+.....+A575
    - △ Takes too long!
- ❖ The function Sum allows us to total a range =sum(A1:A575)
- ❖ Functions consist of a function name and parameters set in parenthesis if more than one parameter is needed the parameters are separated by commas

## Common Functions

- ❖ ABS(value or cell) - Returns absolute value
  - For negative values this yields a positive value.
- ❖ ROUND(value or cell, number of decimal places) - Rounds number to specified decimal places.
  - Round above other than decimal specify a negative number for the decimal places parameter
    - ▲ EXAMPLE: to round cell B5 to the thousands place
      - =ROUND(B5,-3)
  - NOTE: Formatting can make numbers appear rounded, but it does not change the value calculated.

## More Functions

- ❖ PMT(interest, term, principal) - Returns a payment for a loan given the specified interest, term and principal
  - If calculating monthly payments, divide annual interest by 12.
  - Term is the number of payments.
    - ▲ 60 month loan is 60.
    - ▲ 20 year loan is 240 (20 years times 12 months)
- ❖ IF(condition, ifyes, ifno) - Provides a conditional return.
  - if the condition is met, the if yes parameter is returned otherwise if no parameter is

## Embedding Functions

- ❖ Embedding or nesting of functions - placing one function inside another.
  - Example: =Round(PMT (B1/12,B2,B3),2)
- ❖ Functions can also be embedded in a more complex formula
  - Example: =Sum(A5:A95)\*B4+(B59/C3)





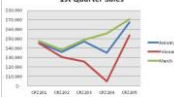
## Spreadsheet Charts

A picture's worth a thousand words

## Charts (also called Graphs)

- ❖ Convey information visually.
  - Quicker to perceive comparisons
- ❖ Represent numbers visually
  - A picture is worth a thousand words
  - ..but a picture without words is meaningless -- be sure to label your charts

## Types of Charts

- ❖ Many different types of charts are available which will help convey the information
- ❖ Bar & column
  - 
- ❖ Area
  - 
- ❖ Stacked Column
  - 
- ❖ Pie
  - 
- ❖ Line
  - 
- ❖ And many more

## Designing a Chart

- ❖ Keep it simple
- ❖ Decide which information to convey
- ❖ Decide how the information should be presented:
  - Most spreadsheets can show the same information in two aspects
    - ↳ Series in rows
    - ↳ Series in column
  - Select the most appropriate type of chart



## Designing a Chart (cont)

- ❖ Include only the information needed
  - Don't include totals if comparing individual amounts (most often for column/bar, line, area types)
  - Select only totals if comparing only the totals (most often for pie charts) but don't include individual amounts or the grand total.

	A	B	C	D	E
1	Crazy Computer Sales				
2		January	February	March	Total
3	CRZ201	\$ 45,565.00	\$ 43,250.00	\$ 47,500.00	\$ 138,315.00
4	CRZ202	\$ 35,775.00	\$ 30,500.00	\$ 38,500.00	\$ 104,775.00
5	CRZ203	\$ 47,000.00	\$ 25,675.00	\$ 48,775.00	\$ 121,450.00
6	CRZ204	\$ 35,000.00	\$ 4,000.00	\$ 55,500.00	\$ 95,500.00
7	CRZ205	\$ 67,450.00	\$ 53,450.00	\$ 70,750.00	\$ 191,650.00
8	Total	\$ 236,790.00	\$ 159,675.00	\$ 261,025.00	\$ 657,490.00

	A	B	C	D	E
1	Crazy Computer Sales				
2		January	February	March	Total
3	CRZ201	\$ 45,565.00	\$ 43,250.00	\$ 47,500.00	\$ 138,315.00
4	CRZ202	\$ 35,775.00	\$ 30,500.00	\$ 38,500.00	\$ 104,775.00
5	CRZ203	\$ 47,000.00	\$ 25,675.00	\$ 48,775.00	\$ 121,450.00
6	CRZ204	\$ 35,000.00	\$ 4,000.00	\$ 55,500.00	\$ 95,500.00
7	CRZ205	\$ 67,450.00	\$ 53,450.00	\$ 70,750.00	\$ 191,650.00
8	Total	\$ 236,790.00	\$ 159,675.00	\$ 261,025.00	\$ 657,490.00



## Two Perspectives

- ❖ Data can be shown different ways

	A	B	C	D
1		January	February	March
2	CRZ201	\$ 45,565.00	\$ 43,250.00	\$ 47,500.00
3	CRZ202	\$ 35,775.00	\$ 40,500.00	\$ 38,500.00
4	CRZ203	\$ 47,000.00	\$ 25,675.00	\$ 48,775.00
5	CRZ204	\$ 35,000.00	\$ 48,000.00	\$ 55,500.00
6	CRZ205	\$ 67,459.00	\$ 53,450.00	\$ 70,750.00

### ➢ Row-wise



### ➢ Column wise



## About Charts

- ❖ Charts update automatically when numbers are changed.
- ❖ Charts should contain
  - Labels
    - ↳ horizontal (X) & vertical (Y) axis labels
    - ↳ Titles
  - Data series portrayed graphically
  - Legends explaining the graph
- ❖ Charts may contain
  - Annotations
  - Other images



## Managing Spreadsheet Data

and working with long sheets

## Tools for Long Worksheets

- ❖ Locking Titles
  - Freezing the titles rows or column on the screen
- ❖ Split Screen
  - Viewing two parts of a list at once
- ❖ Sorting Lists
  - Sorting columns by one or more criteria
- ❖ Data Filters
  - Viewing parts of the data
- ❖ Data summaries
  - Summarizing specified data



## Freezing Titles

- ❖ Column and/or row titles can be locked
- ❖ Allows titles to remain in place while scrolling
- ❖ Position cursor in the cell after the titles
  - If spreadsheet has just column titles, click in the cell in first column on the row just below the titles
  - If spreadsheet has just row titles, click in the cell in first row in column just left of the titles
  - If both columns & row title click in the first data cell after the titles

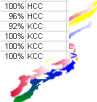


## Freezing titles

- ❖ Setting the tiles for rows & columns
- ❖ Effect when scrolling down and across

	A	B	C	D	E	F
1	ICS Courses					
2	Course	Description	Instructor	Enrollment	Open seats	Fill rate
3	ICS 100	Computer Literacy & Apps	P Regentini	20	0	100% W
4	ICS 100	Computer Literacy & Apps	P Regentini	19	1	96% W
5	ICS 100	Computer Literacy & Apps	E Tronger	21	0	100% W
6	ICS 100	Computer Literacy & Apps	V Cole	19	1	96% W
7	ICS 100	Computer Literacy & Apps	P Regentini	19	1	96% W
8	ICS 100	Computing Lit & Apps	E Pilo	23	0	100% LC
9	ICS 100	Computing Lit & Apps	A Ramos	20	2	91% LC
10	ICS 100	Computing Lit & Apps	M Bauer	24	0	100% LC
11	ICS 100	Computing Lit & Apps	M Bauer	24	0	100% LC
12	ICS 100	Computing Lit & Apps	E Pilo	22	0	100% LC
13	ICS 100	Computing Lit & Apps	A Ramos	12	10	86% LC
14	ICS 100	Computing Lit & Apps	C Sune	22	0	100% LC

	A	C	D	E	F	G
1	ICS C					
2	Course	Instructor	Enrollment	Open seats	Fill rate	Campus
66	ICS 100	S Trice	24	0	100% HCC	
67	ICS 100	V Takebayashi	24	0	100% HCC	
68	ICS 100	S Trice	23	1	96% HCC	
69	ICS 100	R Poole	22	2	92% HCC	
70	ICS 100	M Cress	24	0	100% HCC	
71	ICS 100	R Stephenson	23	1	96% HCC	
72	ICS 101	S Takaki	23	2	92% KCC	
73	ICS 101	A Seta	30	0	100% KCC	
74	ICS 101	S Takaki	25	0	100% KCC	
75	ICS 101	A Seta	26	0	100% KCC	



## Split Screen

- ❖ Splits the screen so that two parts of the same spreadsheet can be viewed at once.
- ❖ Allows for independent scrolling of sections
- ❖ Example:

	A	B	C	D	E	F	G	H
1	Course	Description	Credits	Instructor	Seats	Open	Percent	File
2	ICS 100	Computing Literacy & Apps	3	Bauman	24	0	100.00%	MMV 11350
3	ICS 100	Computing Literacy & Apps	3	Trice	23	1	95.83%	MMV 02300
4	ICS 100	Computing Literacy & Apps	3	Bauman	24	0	100.00%	MMV 08300
5	ICS 100	Computing Literacy & Apps	3	Bauman	24	0	100.00%	MMV 01000
6	ICS 100	Computing Literacy & Apps	3	McCullough	22	2	91.67%	MMV 05500
7	ICS 100	Computing Literacy & Apps	3	Takabayashi	23	1	95.83%	TR 08300
8	ICS 100	Computing Literacy & Apps	3	Trice	23	1	95.83%	TR 02300
9	ICS 100	Computing Literacy & Apps	3	Bauman	23	1	95.83%	TR 11300
10	ICS 100	Computing Literacy & Apps	3	Trice	20	4	83.33%	MMV 08300
11	ICS 100	Computing Literacy & Apps	3	Rhoads	22	2	91.67%	TR 01000
12	ICS 100	Computing Literacy & Apps	3	Rhoads	22	2	91.67%	MMV 01000
13	ICS 291	Helping Internetworking	3	Lee	19	0	100.00%	MMVF 07000
14	ICS 292	Helping Processes	3	Lee	19	0	100.00%	MMVF 07000
15	ICS 293	Cooperative Ed	3	Lee	4	21	18.00%	TR 10300
16	ICS 294	Helping Net Anal & Des	3	Lee	19	0	100.00%	MMVF 07000
17	ICS 100	Comp Lit & Appl	3	Tronger	15	4	73.33%	MMVF 10300
18	ICS 100	Comp Lit & Appl	3	Regentini	21	0	100.00%	TR 11150
19	ICS 100	Comp Lit & Appl	3	Regentini	15	4	73.33%	TR 01300
20	ICS 100	Comp Lit & Appl	3	Regentini	17	2	89.47%	MMV 01300
21	ICS 100	Comp Lit & Appl	3	Tronger	17	2	89.47%	MMVF 08300
22	ICS 101	Tools Info Age	3	Cole	10	0	52.63%	MMV 05300



## Sorting Data

- ❖ Sort list by particular columns
- ❖ Sort ascending or descending order
- ❖ Create up to three levels of sorts
- ❖ Sort options allow sorting non alphabetic lists such as days of the week, months
- ❖ Be sure to select complete range to be sorted

## Data Filters

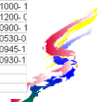
- ❖ Shows only the rows specified by the filter
- ❖ Excel offers two types of filters
- ❖ Autofilter (easiest to use)
  - ❖ Advanced Filter
    - Filters using a column heads.
      - Types
        - Multiple criteria
        - Unique records
        - Extracts
      - Criteria Range
        - Needs to be set up
        - Headings must match
  - Select Data contained in column
  - Top ten
  - Custom
  - Boolean logic (AND / OR)
  - Blanks
  - Non blanks



## Autofilter Example

- ❖ Note the down arrows, click on these to create filter
  - Autofilter on Course = ICS101

	A	B	C	D	E	F	G	H	I
1	Course	Description	Credit	Instructor	Seats	Open	Percent	File	Day
17	ICS 101	Tools for Information Age	3	Poole	19	5	79.17%	TR	01000-C
18	ICS 101	Tools for Information Age	3	Poole	23	1	95.83%	TR	10000-1
19	ICS 101	Tools for Information Age	3	Poole	13	11	54.17%	TR	08300-C
20	ICS 101	Tools for Information Age	3	Yamashita	32	0	100.00%	F	09300-1
24	ICS 101	Tools for Information Age	3	Talley	26	4	86.67%	TBA	TBA
26	ICS 101	Tools for Information Age	3	Setta	28	2	93.33%	TR	03150-0
28	ICS 101	Tools for Information Age	3	Singer	23	7	78.67%	TBA	TBA
29	ICS 101	Tools for Information Age	3	Talley	28	2	93.33%	TBA	TBA
37	ICS 101	Tools for Information Age	3	Setta	28	2	93.33%	MMV	09150-1
38	ICS 101	Tools for Information Age	3	Setta	28	4	86.67%	MMV	07450-0
40	ICS 101	Tools for Information Age	3	Setta	20	10	66.67%	MMV	03150-0
57	ICS 101	Tools for Info Age	3	Levy	23	2	92.00%	MMVF	10000-1
58	ICS 101	Tools for Info Age	3	Polo	12	13	48.00%	TR	12000-C
69	ICS 101	Tools for Info Age	3	Polo	20	5	80.00%	TR	09000-1
79	ICS 101	Tools Info Age	3	Cole	10	9	52.63%	MMV	05300-0
80	ICS 101	Tools Info Age	3	Regentini	16	3	54.21%	TR	09450-1
81	ICS 101	Tools Info Age	3	Regentini	15	4	78.95%	MMVF	09300-1
82									
83									
84									
85									
86									
87									



## Advanced Filter

- ❖ Filtering a list of courses with fill rates set at different rates for each of three campuses
  - This type of criteria can not be accomplished through autofilters.
- ❖ Criteria range has been added to top of worksheet and is the first 4 rows

## Example

	A	B	C	D	E	F	G
1	Course Description	Instructor	Enrollment	Open seats	Fill rate	Campus	
2					<=80	WCC	
3					<=80	LCC	
4					<=95	KCC	
5	<b>ICS Courses</b>						
6	Course Description	Instructor	Enrollment	Open seats	Fill rate	Campus	
17	ICS 100	Computing Lit & Apps	A Ramos	12	10	55% LCC	
18	ICS 101	Digital Tools for Info World	L Chen	14	6	54% LCC	
19	ICS 105	Comp. & Info Literacy Exam PreE	E Troniger	17	3	85% WCC	
20	ICS 107	Web Site Development	V Cole	22	3	89% WCC	
21	ICS 141	Discrete Math for Comp Sci I	D Masson	14	6	54% WCC	
22	ICS 184	Netprep Network Fund	B Polo	13	9	59% LCC	
23	ICS 185	Netprep Local Area Net	B Polo	11	11	80% LCC	
24	ICS 214	Design for Print & Web	J Marquardt	12	6	50% WCC	
25	ICS 241	Discrete Math for Comp Sci II	M Bauer	16	6	73% LCC	
26	ICS 288B	Topics in Networking: Wireless V	Lee	7	15	32% LCC	
27	ICS 288C	Topics in Networking: Security V	Lee	10	12	45% LCC	
28	ICS 100	Computing Literacy and Apps	H Corcoran	18	2	90% KCC	
29	ICS 100	Computing Literacy and Apps	K Yokota	23	2	92% KCC	
30	ICS 100	Computing Literacy and Apps	H Corcoran	15	5	75% KCC	
31	ICS 100	Computing Literacy and Apps	D Nakasone	23	2	92% KCC	
32	ICS 100	Computing Literacy and Apps	D Nakasone	19	6	76% KCC	
33	ICS 100	Computing Literacy and Apps	D Nakasone	21	4	84% KCC	
34	ICS 100	Computing Literacy and Apps	D Nakasone	22	3	89% KCC	
35	ICS 101	Digital Tools Info World	S Takaki	23	2	92% KCC	
36	ICS 101	Digital Tools Info World	A Saita	21	4	84% KCC	
37	ICS 101	Digital Tools Info World	S Singer	23	2	92% KCC	
38	ICS 101	Digital Tools Info World	S Singer	20	5	80% KCC	
39	ICS 101	Digital Tools Info World	S Singer	22	3	89% KCC	
40	ICS 111	Intro to Computer Science I	A Saita	20	5	80% KCC	
41	ICS 211	Intro to Computer Science II	P Gilbert	12	13	49% KCC	

## Data Summaries

- ❖ Summarize data in lists
- ❖ List must be sorted first on categories to be summarized
  - One of the columns such as course number
- ❖ Various columns can be summarized
  - Sum, Average, Count, Max Min, etc.
- ❖ Subtotal function can be automatically inserted
- ❖ Details can be hidden and just summaries shown

## Example of Summary

- ❖ Subtotals for each course, summing the seats filled column

	A	B	C	D	E	F	G	H	I
1	Course Description	Credits	Instructor	Seats FI	Seats O	Percent Filled	Day		
13	ICS 100	Computing Literacy & Apps	3	Takebayashi	23	1	95.83%	MW	
14	ICS 100	Computing Literacy & Apps	3	Bauman	23	1	95.83%	TR	
15	ICS 100 Total				297				
16	ICS 100	Comp Lit & Apps (Trans)	3	Poole	17	7	70.83%	MW	
17	ICS 100	Comp Lit & Apps (Trans)	3	Poole	16	8	66.67%	MW	
18	ICS 100 Total				33				
19	ICS 101	Tools for Information Age	3	Poole	19	5	79.17%	TR	
20	ICS 101	Tools for Information Age	3	Poole	23	1	95.83%	TR	
21	ICS 101	Tools for Information Age	3	Poole	13	11	54.17%	TR	
22	ICS 101 Total				55				
23	ICS 102	Intro to Internet Resources	3	Trice	20	4	83.33%	TR	
24	ICS 102	Intro to Internet Resources	3	Trice	14	10	58.33%	MW	
25	ICS 102 Total				34				
26	ICS 110	Intro to Information Systems	3	Takebayashi	7	4	63.64%	TR	
27	ICS 110 Total				7				
28	ICS 100	Computing Literacy and Apps	3	Lum	24	6	80.00%	WF	
29	ICS 100	Computing Literacy and Apps	3	Gibler	23	7	78.67%	F	
30	ICS 100	Computing Literacy and Apps	3	Berg	20	10	66.67%	MW	
31	ICS 100	Computing Literacy and Apps	3	Toshi	25	5	83.33%	TR	
32	ICS 100	Computing Literacy and Apps	3	Gibler	10	0	100.00%	MW	
33	ICS 100	Computing Literacy and Apps	3	Singer	24	6	80.00%	TR	
34	ICS 100	Computing Literacy and Apps	3	Gibler	9	11	45.00%	MW	
35	ICS 100	Computing Literacy and Apps	3	Carrero	22	8	73.33%	TR	
36	ICS 100 Total				157				

## Just the Summary Data

- ❖ Shows just the subtotals for each course and the grand total. No data rows are shown
- ❖ Note the 1 2 3 in the upper left hand corner
  - Click on 2 to see the subtotals
  - Click on 1 to see just the grand total
  - Click on 3 to bring back the data rows

## Just Summaries Example

	A	B	C	D	E	F	G
1	Course Description	Credits	Instructor	Seats FI	Seats O	Percent Filled	
69	ICS 100 Total					279	
73	ICS 101 Total					55	
75	ICS 106 Total					15	
77	ICS 110 Total					20	
81	ICS 111 Total					49	
83	ICS 125 Total					14	
85	ICS 135 Total					9	
87	ICS 184 Total					13	
89	ICS 185 Total					10	
91	ICS 270 Total					1	
93	ICS 291 Total					19	
95	ICS 292 Total					19	
97	ICS 293D Total					4	
99	ICS 294 Total					19	
105	ICS 100 Total					85	
109	ICS 101 Total					41	
111	ICS 105 Total					17	
112	Grand Total					1541	
113							
114							



## More Functions

- ❖ **vlookup (lookup item, range to look in, column)**
  - Looks vertically through a range to find the lookup item in the left hand column of the range.
  - Yields the contents of a cell in the same row in the column you specify.
  - Lookup item – refer to the cell that contains the item you wish to look up.
  - Range to look in – refer to the range you wish to search
  - Column – a number greater than 1 which is the column of the range from which the data is needed. The lefthand column is 1, the next column over is 2.
- ❖ **hlookup (lookup item, range to look in, row)**
  - Similar to Vlookup but looks horizontally looks at top row

## More Functions (cont).

- ❖ **rand ()**
  - Yields a random decimal number between 0 and 1
  - Multiply by a number to yield a number larger than 1
    - ▲ For a random number between 0-10
    - ▲ Multiply by 10
    - ▲ Round to 0 decimal places
      - =round(rand()\*10,0)
- ❖ **randbetween(low number, high number)**
  - similar to rand, but yields a random number between and including the low and high numbers specified.

## What If Analysis

- ❖ **What if Analysis**
  - Allows us to vary and compare data
- ❖ **Methods**
  - **What If - Table**
    - ▲ Produces a matrix of varying data along horizontal and vertical, and fills in data answers to varying the data
  - **What If - Goal Seek**
    - ▲ Input the desired amount and indicate which cell to vary