



Introduction to Excel and Spreadsheets

Omnilore Computer Talk
2015 Sep. 24
Hal Hart

9/24/15

"Excel & Spreadsheets" Computer Talk

1



Outline

- Definition of "Spreadsheet"
 - Spreadsheet Applications over the years
- Simple Accounting
 - Example: Check Ledger
- Math Formulas
- Other Types of Formulas
 - Example: SDG Selection Records + Metrics
- Drawing Organization Charts, Flowcharts
- Excel Help References

9/24/15

"Excel & Spreadsheets" Computer Talk

2



Definition of “Spreadsheet”

- Dictionary.com:
 - a type of software that offers the user a visual display of a simulated multicolumn worksheet and the means of using it especially for financial plans and budgets.
 - “worksheet” = a *table or matrix of data*
 - a single document created with this software.
- Wikipedia:
 - A **spreadsheet** is an interactive [computer application](#) program for organization, analysis and storage of [data](#) in [tabular](#) form. Spreadsheets developed as computerized simulations of paper accounting [worksheets](#). The program operates on data represented as cells of an array, organized in rows and columns. Each cell of the array is a [model-view-controller](#) element that may contain either numeric or text data, or the results of [formulas](#) that automatically calculate and display a value based on the contents of other cells.



Simple Accounting

Example: Simple Home-Made Check Ledger Automatic Calculations in “Balance” Column

	A	B	C	D	E	F
1						
2						
3						
4						
5	Date	Check #	Payee or Payer	Paid	Deposit	Balance
6	1/1/15		Starting Balance =			\$1,300.00
7	1/3/15		Soc. Sec.		\$1,200.00	\$2,500.00
8	1/5/14	101	Clothing Store	\$345.00		\$2,155.00
9	1/15/15		Pension		\$1,500.00	\$3,655.00
10	1/20/15		CU (Dep. + cash back)	\$100.00	\$500.00	\$4,055.00
11	1/21/15	102	Groc. Store	\$59.00		\$3,996.00
12	1/31/15	103	3rd Feb. (mortgage)	\$4,000.00		-\$4.00
13						-\$4.00
14						-\$4.00
15						-\$4.00
16						-\$4.00
17						-\$4.00



Simple Accounting

Example: Simple Home-Made Check Ledger
Some Simple Formulas (copied in column)

	A	B	C	D	E	F
1						
2						
3						
4						
5	Date	Check #	Payee or Payer	Paid	Deposit	Balance
6	1/1/15		Starting Balance =			\$1,300.00
7	1/3/15		Soc. Sec.		\$1,200.00	\$2,500.00
8	1/5/14	101	Clothing Store	\$345.00		\$2,155.00
9	1/15/15		Pension		\$1,500.00	\$3,655.00
10	1/20/15		CU (Dep. + cash back)	\$100.00	\$500.00	\$4,055.00
11	1/21/15	102	Groc. Store	\$59.00		\$3,996.00
12	1/31/15	103	3rd Feb. (mortgage)	\$4,000.00		-\$4.00
13						-\$4.00
14						-\$4.00
15						-\$4.00
16						-\$4.00
17						-\$4.00



Simple Accounting

Example: Simple Home-Made Check Ledger
Changing Currency Formats

	A	B	C	D	E	F
1						
2						
3						
4						
5	Date	Check #	Payee or Payer	Paid	Deposit	Balance
6	1/1/15		Starting Balance =			\$1,300.00
7	1/2/15		Soc. Sec.		1,200.00	\$2,500.00
8	1/5/14	101	Clothing Store	345.00		\$2,155.00
9	1/15/15		Pension		1,500.00	\$3,655.00
10	1/20/15		CU (Dep. + cash back)	100.00	500.00	\$4,055.00
11	1/30/15	102	Groc. Store	59.00		\$3,996.00
12	1/31/15	103	3rd Feb. (mortgage)	4,000.00		-\$4.00
13	1/31/15		Soc. Sec.			-\$4.00
14						-\$4.00
15						-\$4.00



Simple Accounting

Example: Simple Home-Made Check Ledger Adding Functionality for "Cleared" Balance

Date	Check #	Payee or Payer	Paid	Deposit	Balance	Cleared	Funds
1/1/15		Starting Balance =			\$1,300.00		\$1,300.00
1/2/15		Soc. Sec.		1,200.00	\$2,500.00	X	\$2,500.00
1/5/14	101	Clothing Store	345.00		\$2,155.00	C	\$2,155.00
1/15/15		Pension		1,500.00	\$3,655.00	x	\$3,655.00
1/20/15		CU (Dep. + cash back)	100.00	500.00	\$4,055.00	x	\$4,055.00
1/30/15	102	Groc. Store	59.00		\$3,996.00	c	\$3,996.00
1/31/15	103	3rd Feb. (mortgage)	4,000.00		-\$4.00		\$3,996.00
1/31/15		Soc. Sec.			-\$4.00		\$3,996.00
					-\$4.00		\$3,996.00

=I6 + IF(ISBLANK(H7), 0, -D7+E7)



Simple Accounting

Example: Simple Home-Made Check Ledger Adding Functionality for "Cleared" Balance

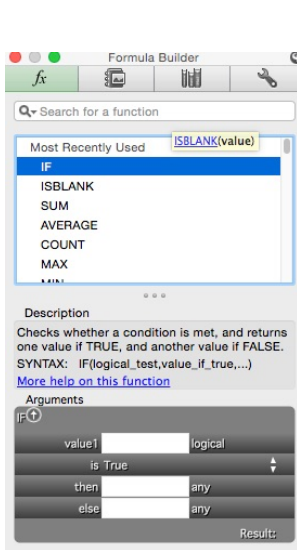
The screenshot shows two overlapping 'Formula Builder' windows. The left window is for the IF function, and the right window is for the ISBLANK function. Both windows show the function name selected in the 'Most Recently Used' list. The IF window shows its arguments: value1, logical, is True, then, and else. The ISBLANK window shows its argument: value.



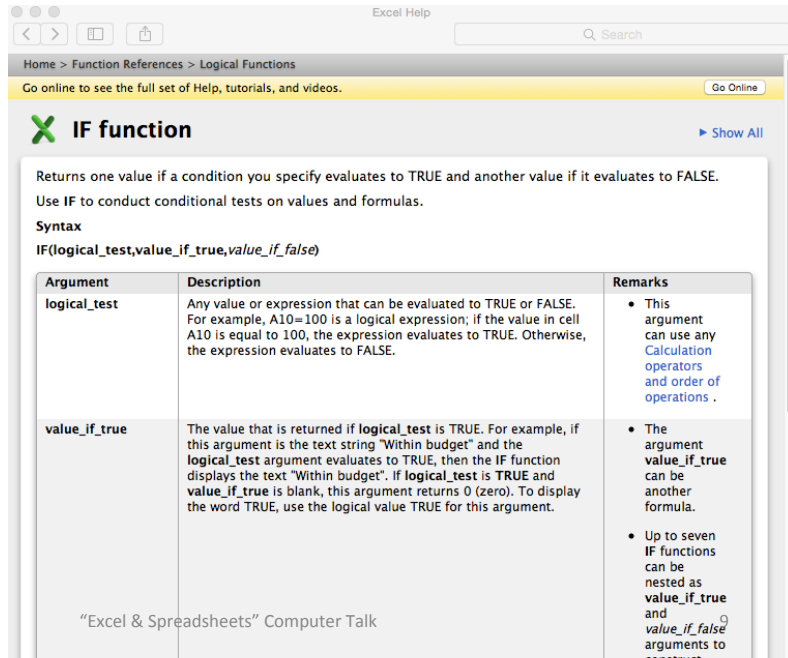
Simple Accounting

Example: Simple Home-Made Check Ledger

"Help" inside Excel for building formulas



9/24/15



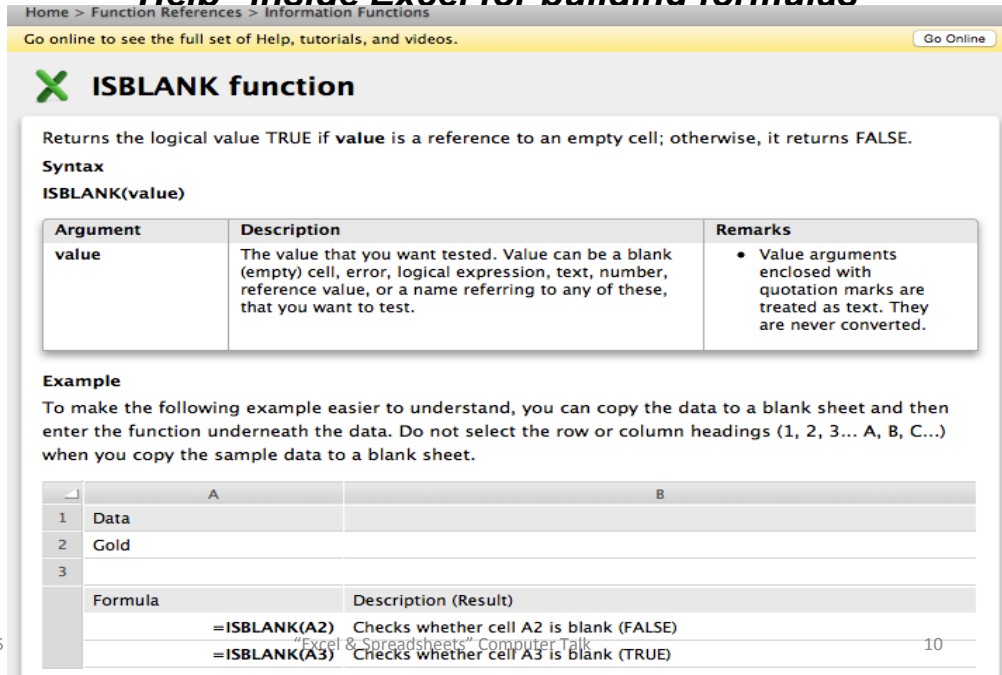
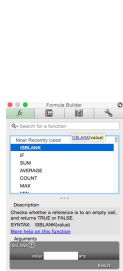
"Excel & Spreadsheets" Computer Talk



Simple Accounting

Example: Simple Home-Made Check Ledger

"Help" inside Excel for building formulas



9/24/15

"Excel & Spreadsheets" Computer Talk

10



A Free "Professional" Checkbook Register

H16 fx =IF(AND(ISBLANK(F16),ISBLANK(G16))," - ",OFFSET(H16,-1,0,1,1)+G16-F16)

Checkbook Register								Name: _____	
							Current Balance:	143.46	
							Cleared Balance:	330.80	
See instructions in the Help worksheet							Warn when balance is below:	450.00	
Date	Num	Payee / Description	Category	R	Withdrawal, Payment (-)	Deposit, Credit (+)	Balance		
							0.00		
1/01/14		[Balance As of 01/01/2014]	Mortgage/Rent	R		546.00	546.00		
1/01/14	DEP	Direct Deposit from Employer	Wages & Tips	c		1,000.00	1,546.00		
1/10/14	EFT	Car Payment	Auto	c	115.20		1,430.80		
1/15/14	2032	Joe's Food Mart	Groceries		87.34		1,343.46		
1/18/14	TXFR	[Transfer to/from Savings]			100.00		1,243.46		
1/22/14	2033	Rent Payment	Rent	c	1,100.00		143.46		
4/07/14							-		
							-		
							-		

- One of several templates available from Vertex42.com
 - Also Budgets, Invoices, Timesheets, Project Management, ...
- This one downloadable from:

<http://www.vertex42.com/Files/download2/themed.php?file=checkbook-register.xlsx>



A Free "Professional" Checkbook Register *Extra Features*

vertex42

143.46
330.80

450.00

Balance

0.00
546.00
1,546.00
1,430.80
1,343.46
1,243.46
143.46

Checkbook Template by Vertex42.com
© 2008-2014 Vertex42 LLC

Num ← This list used for the Num column

2034 ← This is the next check number
2033 ← Unhide header rows to see the whole list
FEE ← Add options if you want to customize the list

If you like this template, please give it a +1 or link to Vertex42.com from your website or blog. Thank you!

click here to revisit the template page



Updating Home-Made Register to Blank Out After Last Meaningful Balance

F13 fx =IF(AND(ISBLANK(D13),ISBLANK(E13)),"-",F12+E13-D13)

	A	B	C	D	E	F	G	H	I
1									
2									
3									
4									
5	Date	Check #	Payee or Payer	Paid	Deposit	Balance		Cleared	Funds
6	1/1/15		Starting Balance =			\$1,300.00			\$1,300.00
7	1/2/15		Soc. Sec.		1,200.00	\$2,500.00	X		\$2,500.00
8	1/5/14	101	Clothing Store	345.00		\$2,155.00	C		\$2,155.00
9	1/15/15		Pension		1,500.00	\$3,655.00	X		\$3,655.00
10	1/20/15		CU (Dep. + cash back)	100.00	500.00	\$4,055.00	X		\$4,055.00
11	1/30/15	102	Groc. Store	59.00		\$3,996.00			\$4,055.00
12	1/31/15	103	3rd Feb. (mortgage)	4,000.00		-\$4.00			\$4,055.00
13						-			-
14						-			-
15						-			-

=IF (AND (ISBLANK(D13), ISBLANK(E13)), "-", F12+E13-D13)



Excel's Built-In Math Functions & Formulas

- Basic Arithmetic: Add, Subtract, Multiply, Divide
- Math & Trig: ABS, ACOS, ASIN, AGGREGATE, ATAN, CEILING, COS, EXP, EVEN, FLOOR, GCD, INT, LOG, LOG10, MOD, PI, POWER, PRODUCT, QUOTIENT, RADIANS, ROUND, SIN, SQRT, SUBTOTAL, SUM, SUMIF, TAN, TRUNC
- Statistical: AVERAGE, BETA, DIST, BINOMIAL.DIST, CHISQ.TEST, COUNT, COUNTA, COUNTBLANK, DEVSQ, F.TEXT, EXPON.DIST, FISHER, FORECAST, FREQUENCY, GAMMA.DIST, GROWTH, INTERCEPT, LARGE, MAX, MAXA, MEDIAN, MIN, MINA, NORM.DISTR, PERCENTILE.EXC, PERCENTRANK.INC, POISSON.DIST, PROB, QUARTILE.EXC, RANK.EX, SKEW, SLOPE, STANDARDIZE, STDEV.P, STDEVA, TREND



Other Types of Formulas

- Count Blanks
- Count Cells with Numbers
- Count Cells with Alpha
- Logical: AND, FALSE, IF, IFERROR, NOT, OR, TRUE
- Various information about the current operating environment
- Various engineering equations
- ...



Example: SDG Selection Records

A2		fx		=COUNT(D11:D400)																					
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
1	297 # Members				231 Course Takers (COUNT # Numbers > 0 in Col. G)																				
2	293 Submitters (COUNT # Numbers in Col. G)																								
3	4 Missing			62 # Taking 0 SDGs (DCOUNT)			1 # Taking 4 (SUMIF / 4)			324 Total # SDGs Requested															
4	4 Cross-Check Missing			156 # Taking 1 (SUMIF)			1 # Taking 5 (SUMIF / 5)			324 Cross-Check # SDGs Requested weighted (sum of 7 #s to left)															
5				63 # Taking 2 (SUMIF / 2)			1 # Taking 6 (SUMIF / 6)			293 Cross-Check # Submitters (sum of 7 #s to left)															
6				9 # Taking 3 (SUMIF / 3)																					
7																									
8																									
9	First Name	Last Name	Phone	# Class	M a.m.	M p.m.	T a.m.	T p.m.	W a.m.	W p.m.	Th a.m.	Th p.m.	F a.m.	F p.m.	1st	2nd	3rd	4th	5th	6th	Pr #	E-Mail /Box/Mail /Phone/ Hand In	Next #	Next E-Mail	Next Web Vote
10				<1																			292	E-161	W-63
11	Connie	Alexander	545-2286	0																		254	P		
12	Harriet	Allyn	541-4530	1	3	3	3			3	3		3	3	GFT	DOG						63	E-32		
13	Andy	Amram	418-6963	0																		272	E-155		
14	Lynn	Anderson	212-7665	1										3	H2O	GHG						100	E-80		
15	Phyllis	Appel	376-1481	2	3	2	3	2	3	1	3		3		GFT	NYR	POE					242	P		
16	Harriet	Appel	534-1005	1			3	3	3		3	3		3	KAZ							41	M		
17	Maria	Ashia	541-5234	1	3	3	2				2	1	3	3	FOR	TED	DOG					189	E-122		
18	Bob	Bacinski	530-6519	2					3	3					RTC	TED						144	W-40		
19	Leslie	Back	540-3598	2	3	3							3	3	LAA	GFT	FOR					40	E-23		
20	Joann	Bailey	316-7889	1	2	3	3								SOP	GFT	DOG	SJM	AFR			285	E-158		
21	Joann	Bally	372-8213	2			3				3				GFT	SYR	DOG	LAA	CRM	AFR		33	E-20		
22	Dick	Balsam	398-1600	1					3				3		AFR	POE	DIP					70	E-36		
23	Fairveola	Banks	508-8690	0																		105	E-63		

Metrics computed via formulas:

- Total # Members
- # Members who submitted
- # Members not responding ("missing")
- # Members Requesting 0 SDGs (sitting out the trimester)
- # Members Requesting each of 1, 2, 3, 4, 5, & 6 SDGs
- Total # Course Takers & Total # SDGs Requested



A Different Example: Omnilore's Organization Chart

OMNIOLORE ORGANIZATION								
A	B	C	D	E	F	G	H	I
OMNIOLORE ORGANIZATION								
20150809								
BOARD OF DIRECTORS								
Immediate Past President								
8 Elected Posts (* = 3 Executive Committee Members)								
* President								
* Vice President for Academics								
* Vice President for Administration								
Treasurer								
Recording Secretary								
3 Members at Large								
6 Appointees								
Five Committee Chairpersons								
Head Coordinator								
1.0								
President								
Art Irizarry								
2.0								
2.1 Communications Chairperson								
Mary Golob								
2.1.1 Newsletter Editor								
Mary Golob								
2.1.2 Publicity Director								
Mary Golob								
2.2 Technology Chairperson								
TBD								
2.2.1 Website Working Group								
Bill Gargaro								
2.2.2 Webmaster								
Hal Hart and Dennis Goodno								
2.2.3 Computer Working Group								
Rick Spillane								
2.2.4 Equipment Manager								
Hal Hart								
2.2.5 Laptop Administrator								
Rick Spillane								
5.0								
Treasurer								
Gary Nofziger								
5.0								
Recording Secretary								
Gloria Dumais								
6.0								
3.1 Membership Chairperson								
Florence Murphy								
3.2 Office Manager								
[vacant]								
3.3 Mail Distributor								
Dale Korman								
3.4 Archivist								
[vacant]								
3.5 Registrar								
Vickie Volchok								
3.6 Calendar Manager								
Lynn Taber								
3.7 Supplies Manager								
Jill McKenzie								
3.0								
Past President								
Howard Korman								
3.0								
Vice President for Administration								
Linda Jensen								
3.0								
Advisory Council								
Patricia Edie								
Bill Gargaro								
Ruth Hart								
Blanche Herring								
Dick Johnson								
Howard Korman								
Rick Spillane								
John Taber								
Whit Wilson								
Vice President for Academics								
Kathleen Fitzgerald								
4.0								
4.1 Curriculum Chairperson								
Rick Spillane								
4.1.1 S/DG Scheduler								
Ruth and Hal Hart								
4.2 Head Coordinator								
Marilyn Brashear								
4.3 Forum Chairperson								
Lori Geltmann								
7.0 Members at Large								
Helen Leven								
Kate Nelson								
Frank Reiner								
7.1 Member Advocate								
[vacant]								

• Just TEXT entries in cells

• Borders around groups of cells

• Lines are partial cell borders

9/24/15

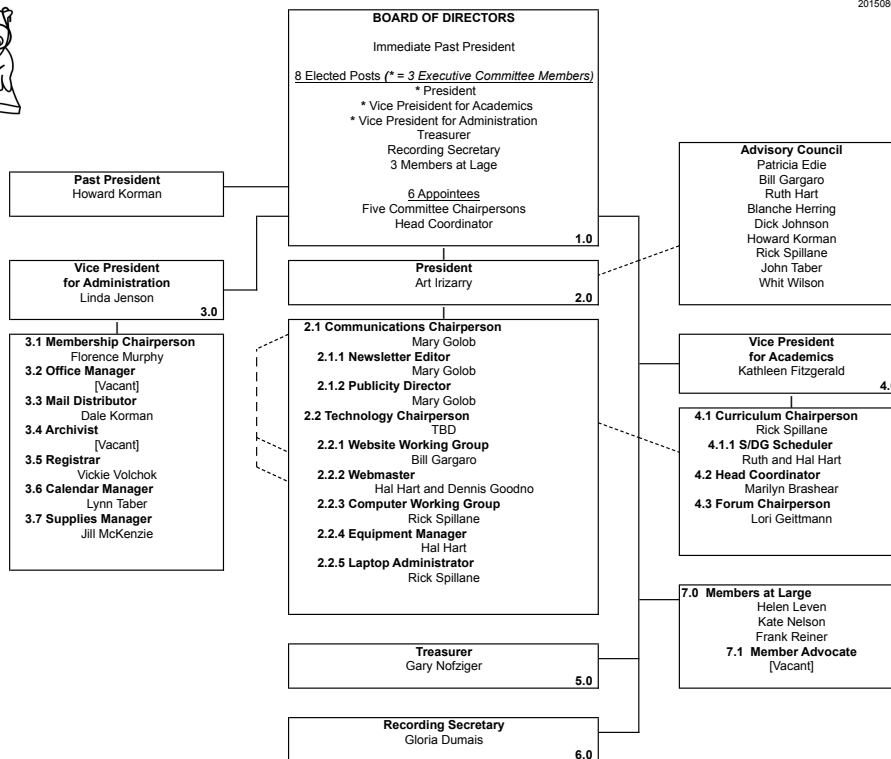
"Excel & Spreadsheets" Computer Talk

17



OMNIOLORE ORGANIZATION

20150809



9/24/15

"Excel & Spreadsheets" Computer Talk

18



Spreadsheet Applications over the years

- 1962: Business Computer Language (**BCL**) implemented a simple spreadsheet concept on IBM 1130 & 7040
- 1970's: LANguage for Programming Arrays at Random (**LANPAR**) — Bell Canada, AT&T, other telecons using GE & Honeywell time-sharing systems
- 1968: **Autoplan/Autotab**
- 1979: **VisiCalc** on Apple II, then IBM PC (1981)
- 1981: IBM's **Lotus 1-2-3** on IBM PC
- 1985: Microsoft **Excel** for Mac, then IBM PC (1987), then assembled into Microsoft Office suite; became market leader (*it still is*)
- Open Source (free): **CALC** in OpenOffice & LibreOffice; Gnumeric, part of [GNOME](#) Free Software Desktop Project.



Excel Help References

- **Wikipedia:** "Spreadsheets" & "Excel"
- **Google:**
 - Find formulas & examples by searching, for example, "Excel count non blank cells," "Excel count text," "Excel templates" ...
- **The Spreadsheet Page** for Excel users and developers:
 - <http://spreadsheetpage.com/index.php>
- **Vertex42** – the guide to Excel in everything:
 - <http://www.vertex42.com/ExcelTemplates/>
- **Featured Excel Templates:**
 - <https://templates.office.com/en-ca/templates-for-Excel>
- **Excel tutorial on the web:** <http://www.excel-easy.com/>