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### Lesson 6 (attached is Lesson6 Worksheets.xlsx)

### Monday Jan 18 due by Jan 31

We begin today's lesson with using an Excel sheet with the game of Tic-Tac-Toe. This simple game will give us a chance to use some of the skills from lessons 1-5 plus add a few formulas we have not yet used.

STEP 1: we make the board using colors and borders. No formulas yet.

L										
	A	B	C	D	E	F	G	H	I	J
1						TEAM	0			
2						TEAM	x			
3										
3										
4										
4										
5										
2										
6										
					1			1		

STEP 2: Let us use columns I and J to keep track of the number of moves by each team. We will use the COUNTIF formula from lesson 1

Let us put into I1 this formula: =COUNTIF(C3:E5,"O")

or even better this formula =COUNTIF(C3:E5,G1)

But before we fill down, we need to use the \$ symbol from lesson 3 and make it into =COUNTIF(C\$3:E\$5,"O") or perhaps =COUNTIF(C\$3:E\$5,G1). This is because the coordinates of the Tic-Tac-Toe board needs to be a constant.

Then we fill down and add the text for "moves so far."

	A	В	С	D	E	F	G	H I	J
1						TEAM	0	0	moves so far
2						TEAM	x	0	) moves so far
3									
3									
4									
5									
6									



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Or to use the NAME feature from lesson 5, we could choose INSERT NAME under the INSERT menu and then define the region of the board as a new name.

mes in workbook: neBoard	
	Close
	Add
	Delete
fers to:	

Now we can use the formula =COUNTIF(TheBoard,G1) in cell I1 and then fill it down.

STEP 3: Let us now add an IF statement to help tell us whose move it is. If we compare I1 with I2, that should tell us whether team X moves or team O moves. We will assume that Team X goes first, so this formula placed into H3 should do it. =IF(I1<I2,"Team O to move","Team X to move")

This way if I1=I2, as in the start of the game, it will be Team X to move. We will use the features to merge the text into 3 cells and add a colorful border.

	- 1	<u> </u>	-			1	1		La L	_
	A	B	C	D	E	F	G	H	l J	
1						TEAM	0		0 moves so far	
2						TEAM	x		0 moves so far	
3								Team	X to move	
4										
5										
6										



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Let us make 2 moves by Team X and 1 move by Team O to check our work. We now get this.

_1	Α	В	С	D	E	F	G	Н	I J
1						TEAM	0		1 moves so far
2						TEAM	x		2 moves so far
3					Х			Team	O to move
4				Х					
5					0				
6									

Whoops, I forgot to center the data in the yellow board. I will do that now and then contemplate how to figure out whether Team X or Team O has won.

I think I need to use cell F3 to find out if there are 3 X's in C3, D3 and E3. One formula we have not used yet is the =AND formula. This formula contains a bunch of equations inside and yields a TRUE or FALSE result. Here is the formula =AND(C3=D3,D3=E3,E3=G2)

that we will use. Take your time, we have never used this before. There are 3 conditions within the AND() formula. We are trying to find out if all of C3, D3 and E3 are equal to "X." But you cannot use a triple equal statement, so we are checking if C3=D3 and if D3=E3. But that will be true when the game begins, so we also need to check if they are equal to the "X" in cell G2.

Now you know what's coming: absolute vs. relative reference. Which cells in the AND formula need to change when we fill down and which cells need to stay fixed?

Yes, just the G2 stays fixed and so that gets the \$ symbol, just before the 2.



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### Our new formula is

=AND(C3=D3,D3=E3,E3=G\$2)

and our board now looks like this after filling down.

	A	B	C	D	E	F	G	H	1	J		
1 2						TEAM	0		1	moves so far		
2						TEAM	x		2	moves so far		
3					Х	FALSE		Team	n 0 '	to move		
4				Х		FALSE						
5					0	FALSE						
6												
					1	1		1				

We now need to do the same for C3, C4 and C5 to see if there are 3 X's in the first vertical column. If you are working through this document by doing it, try it now before you see my formula. Make sure you use the \$ symbol as appropriate knowing that you are going to magic fill to the right.

Now my spreadsheet looks like this and we are almost done. I will put in a winning game for Team X to test it.

	A	В	C	D	E	F	G	Н	I J	
1						TEAM	0		4 moves so far	
2						TEAM	х		5 moves so far	
3			Х	0	Х	FALSE		Team	O to move	
4			Х	Х	0	FALSE				
5			Х	0	0	FALSE				
6			TRUE	FALSE	FALSE					

I notice that I forgot the diagonals! So I will use B6 and F6 to find out if either diagonal is a winning game for Team X.



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### Having done the 8 checks, I now have

	A	В	C	D	E	F	G	Н	1	J
1 2						TEAM	0		4	moves so far
2						TEAM	x		5	moves so far
3			Х	0	Х	FALSE		Tean	n O 1	to move
4			Х	Х	0	FALSE				
5			Х	0	0	FALSE				
6		TRUE	TRUE	FALSE	FALSE	FALSE				
7										

### and if I show formulas (do you remember that it is CTRL and `) I get

A	A B	C	D	E	F	G	Н	I	J
1					TEAM	0		=COUNTIF(TheBoard,G1)	moves so far
2					TEAM	х		=COUNTIF(TheBoard,G2)	moves so far
3		Х	0	Х	=AND(C3=D3,D3=E3,E3=G\$2)		=IF(I1 <i2,"team o="" td="" to<=""><td>move","Team X to mo</td><td>ve")</td></i2,"team>	move","Team X to mo	ve")
4		Х	Х	0	=AND(C4=D4,D4=E4,E4=G\$2)				
5		Х	0	0	=AND(C5=D5,D5=E5,E5=G\$2)				
6	=AND(C5=D4,D4=E3,E3=G2)	=AND(C3=C4,C4=C5,C5=\$G2)	=AND(D3=D4,D4=D5,D5=\$G2)	=AND(E3=E4,E4=E5,E5=\$G2)	=AND(C3=D4,D4=E5,E5=G2)				
7									

which may be hard for you to read so I will split it into 2 pieces for you.

#### Here are columns A-E.

	A B	C	D	E
1				
2				
3		Х	0	Х
4		Х	Х	0
5		Х	0	0
6	=AND(C5=D4,D4=E3,E3=G2)	=AND(C3=C4,C4=C5,C5=\$G2)	=AND(D3=D4,D4=D5,D5=\$G2)	=AND(E3=E4,E4=E5,E5=\$G2)



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Here are columns F-J.

F	G	Н		J
TEAM	0		=COUNTIF(TheBoard,G1)	moves so far
TEAM	х		=COUNTIF(TheBoard,G2)	moves so far
=AND(C3=D3,D3=E3,E3=G\$2)		=IF(I1 <i2,"team o="" th="" to<=""><th>move","Team X to mo</th><th>ve")</th></i2,"team>	move","Team X to mo	ve")
=AND(C4=D4,D4=E4,E4=G\$2)				
=AND(C5=D5,D5=E5,E5=G\$2)				
=AND(C3=D4,D4=E5,E5=G2)				

By the way, the AND formula is called a Boolean operator since it results in TRUE or FALSE. Two other Boolean operators include OR and NOT.

Trivia pursuit? These operators are named after George Boole (1815-1864).

We are about to use OR to decide if Team X wins. We have 8 locations where there is a TRUE or FALSE. If any of them is TRUE then Team X wins. I will put this formula into cell H2 and test it.

A B	С	D	E	P	G	Н	I	J	K
1				TEAM	0		4	moves	so far
2				TEAM	X	TRUE	5	moves	so far
3	Х	0	Х	FALSE		Team	O to mov	/e	
4	Х	Х	0	FALSE					
5	Х	0	0	FALSE					
6 TRUE	TRUE	FALSE	FALSE	FALSE					

=OR(B6,C6,D6,E6,F6,F5,F4,F3)



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Now I blank out cell C5 and notice how H2 changes to FALSE.

_1 A	A B	C	D	E	F	G	Н	I	J	K
1					TEAM	0		4	4 moves	so far
2					TEAM	X	FALSE	4	4 moves	so far
3		Х	0	Х	FALSE		Team	X to mo	ve	
4		Х	Х	0	FALSE					
5			0	0	FALSE					
6	FALSE	FALSE	FALSE	FALSE	FALSE					
7										

But what I really want in cell H2 is to alert the players that Team X wins. So I want the word "wins" to be there if the result of the OR formula is TRUE. So I will be nesting the OR formula within an IF statement. It is getting more complicated but I hope you are okay looking at

=IF(OR(B6,C6,D6,E6,F6,F5,F4,F3)," wins!"," ")

This IF formula is saying "IF the OR is true, then we will display WINS!" but "IF the OR is false, we will display nothing."

Now how to deal with TEAM O? Even though it is possible to do more nesting of IF statements and formulas and make F1 and F2 work, it is easier on the eye and the brain to just use row 7 for checking to see if Team O wins, along with B3, B4 and B5.

A	В	C	D	E	F	G	Н	I	J	K
1					TEAM	0	wins!	5	moves	so far
2					TEAM	х		4	moves	so far
3	FALSE	Х	0	Х	FALSE		Team	X to mov	'e	
4	FALSE	0	Х	Х	FALSE					
5	TRUE	0	0	0	FALSE					
6	FALSE	FALSE	FALSE	FALSE	FALSE					
7	FALSE	FALSE	FALSE	FALSE	FALSE					
0		1		1	1					



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### And if I show the formulas, we have

	A	B	C	D	E	F	G
1						TEAM	0
2						TEAM	х
3		=AND(C3=D3,D3=E3,E3=G1)	Х	0	Х	=AND(C3=D3,D3=E3,E3=G2)	
4		=AND(C4=D4,D4=E4,E4=G1)	0	Х	Х	=AND(C4=D4,D4=E4,E4=G2)	
5		=AND(C5=D5,D5=E5,E5=G1)	0	0	0	=AND(C5=D5,D5=E5,E5=G2)	
6		=AND(C5=D4,D4=E3,E3=G2)	=AND(C3=C4,C4=C5,C5=\$G2)	=AND(D3=D4,D4=D5,D5=\$G2)	=AND(E3=E4,E4=E5,E5=\$G2)	=AND(C3=D4,D4=E5,E5=G2)	
7				=AND(D3=D4,D5=D4,D5=\$G1)			
8							

#### and

	G	Н		J
1	0	=IF(OR(B7,C7,D7,E7,F7,B5,B4,B3)," wins!"," ")	=COUNTIF(TheBoard,G1)	moves so far
2	х	=IF(OR(B6,C6,D6,E6,F6,F5,F4,F3)," wins!"," ")	=COUNTIF(TheBoard,G2)	moves so far
3		=IF(I1 <i2,"team move","team="" o="" t<="" th="" to="" x=""><th>to move")</th><th></th></i2,"team>	to move")	

What remains is to HIDE the rows and columns by clicking on each one and then right mouse clicking (PC) or CTRL clicking (Mac) and choose HIDE. Of course, I could have also use the HIDE choice under the FORMAT menu. Notice that columns B and F are gone as are rows 6 and 7.

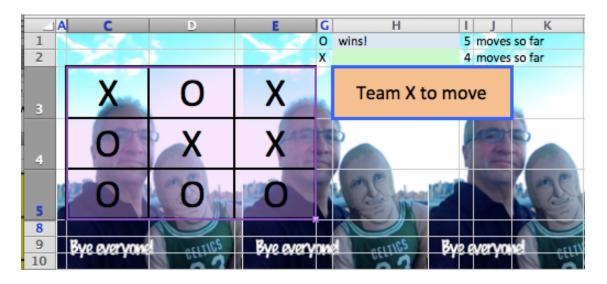
A	C	D	E	G	Н	1	J	K
1				0	wins!	5	moves	so far
2				х		4	moves	so far
3	Х	0	Х		Team X to m	101	/e	
4	0	Х	Х					
5	0	0	0					
8								

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Some people like to use a graphic for the background to make their game more visually interesting. Excel offers a feature called FORMAT SHEET BACKGROUND which then results in



Here is another example of a formula that use IF and AND

=IF(AND(B2>45,C2="sun"),"GO OUTSIDE","STAY INSIDE") This formula located in cell D2 is telling Excel to either put GO OUTSIDE or STAY INSIDE in that cell. The decision criteria is the AND portion which involves B2>45 and C2="sun" for the components. If both things are true then the AND is true and we GO OUTSIDE. If either one is false, then the AND is false and we STAY INSIDE.

Here is how it looks

2	A	B	С	D
1	Date	Temperature	Weather	Good/Bad
2	2/1/15	53	Rain	STAY INSIDE
3	2/2/15	57	Rain	STAY INSIDE
4	2/3/15	54	Sun	GO OUTSIDE
5	2/4/15	30	Sun	STAY INSIDE
6	2/5/15	34	Rain	STAY INSIDE
7	2/6/15	50	Sun	STAY INSIDE

#### and here are the formulas via FILL DOWN of course.

_	A	В	C	D
1	Date	Temperature	Weather	Good/Bad
2	42036	=RANDBETWEEN(30,60)	=CHOOSE(RANDBETWEEN(1,2),"Sun","Rain")	=IF(AND(B2>45,C2="sun"),"GO OUTSIDE","STAY INSIDE")
3	42037	=RANDBETWEEN(30,60)	=CHOOSE(RANDBETWEEN(1,2),"Sun","Rain")	=IF(AND(B3>50,C3="sun"),"GO OUTSIDE","STAY INSIDE")
4	42038	=RANDBETWEEN(30,60)	=CHOOSE(RANDBETWEEN(1,2),"Sun","Rain")	=IF(AND(B4>50,C4="sun"),"GO OUTSIDE","STAY INSIDE")
5	42039	=RANDBETWEEN(30,60)	=CHOOSE(RANDBETWEEN(1,2),"Sun","Rain")	=IF(AND(B5>50,C5="sun"),"GO OUTSIDE","STAY INSIDE")
6	42040	=RANDBETWEEN(30,60)	=CHOOSE(RANDBETWEEN(1,2),"Sun","Rain")	=IF(AND(B6>50,C6="sun"),"GO OUTSIDE","STAY INSIDE")
7	42041	=RANDBETWEEN(30,60)	=CHOOSE(RANDBETWEEN(1,2),"Sun","Rain")	=IF(AND(B7>50,C7="sun"),"GO OUTSIDE","STAY INSIDE")
-				

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#### Here is another example

```
=IF(OR(B2<70,C2="poor"),"Meet with teacher","")
```

This IF COMMAND says if the student's grade is less than 70 or behavior is "poor" then we meet with teacher.

	A	В	С	D
1	Assignment	Grade	Behavior	Report
2	Paper	78	poor	Meet with teacher
3	Test	95	ok	
4	Paper	69	ok	Meet with teacher
5	Test	89	poor	Meet with teacher
6	Test	91	ok	
7	Paper	82	good	

and the formulas below including a fancy way to randomly choose amongst 4 things in column A

	A	B	C	D
1	Assignment	Grade	Behavior	Report
2	=CHOOSE(RANDBETWEEN(1,4), "Test", "Paper", "Quiz", "Homework")	78	poor	=IF(OR(B2<70,C2="poor"),"Meet with teacher","")
3	=CHOOSE (RANDBETWEEN (1,4), "Test", "Paper", "Quiz", "Homework")	95	ok	=IF(OR(B3<70,C3="poor"),"Meet with teacher","")
4	=CHOOSE (RANDBETWEEN (1,4), "Test", "Paper", "Quiz", "Homework")	69	ok	=IF(OR(B4<70,C4="poor"),"Meet with teacher","")
5	=CHOOSE(RANDBETWEEN(1,4), "Test", "Paper", "Quiz", "Homework")	89	poor	=IF(OR(B5<70,C5="poor"),"Meet with teacher","")
6	=CHOOSE (RANDBETWEEN (1,4), "Test", "Paper", "Quiz", "Homework")	91	ok	=IF(OR(B6<70,C6="poor"),"Meet with teacher","")

And finally one more example of NESTED IF statements created for use to coordinate scheduling of athletic games in a New York City independent school area.

	Α	В	С	D	E	F	G	Н		J	K	L	M	N	0	Р	Q	R
1	Team 1 League	Team 2 League	Date	Team 1	Team 2	Site	Score Team 1	Score Team 2	Result	Missing	Score Check	Site Check	Date Check	Non NYSAIS	Score Code	Site Code	Game Code	Date Code
2	PSAA	PSAA	11/17/14	<b>v</b> -Forest Sch	School of Ga	home	61	66	loss						41960806115466	4196080154H	41960.0001	4196080154
3	PSAA	PSAA	11/17/14	School of Ga	w-Forest Sch	away	66	61	win						41960154668061	4196015480A	41960.0001	4196080154
4	ISAL	ISAL	11/17/14	ican School,	l'athen Lenox	home	49	57	loss						4196055491457	419605514H	41960.0013	419605514
5	ISAL	ISAL	11/17/14	athen Lenox	ican School,	away	57	49	win				r	r	4196014575549	419601455A	41960.0013	419605514
6	PSAA	NYCAL	11/18/14	ons Internatio	.oyola Schoo	away	49	74	loss					r	41961152499174	4196115291A	41961.0001	4196191152
7	NIVOAL		44/40/44	avala Cabaa	long Internet	home	74	40							44064047445040	4400404450U	44004 0004	4400404450

Consider cell I3 that contains

=IF(G3="","",IF(H3="","",IF(G3>H3,"win",IF(H3>G3,"loss",IF(G3=H3,"tie")))))

if we just consider the blue portion, that is easy telling us that if G3=H3 we want to type "tie" in the box. Well now consider the yellow portion.

=IF(G3="","",IF(H3="","",IF(G3>H3,"win",<mark>IF(H3>G3,"loss",IF(G3=H3,"tie"</mark>)))))

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This yellow portion is saying if H3>G3 then we want to type "loss" in the box. Otherwise we want to check if G3=H3 to execute the blue portion. Got it? Now going backwards, consider the green portion.

=IF(G3="","",IF(H3="","",IF(G3>H3,"win",IF(H3>G3,"loss",IF(G3=H3,"tie"))))) This green portion is saying if G3>H3 then we want to type "win" in the box. Otherwise we want to execute the yellow portion previously reviewed. Got it? This pattern of nesting IF statements to generate a variety of results is a very common pattern for skilled Excel users.

Required HW 6.1 Try right now to write one statement that tells a student A if over 90, B if over 80, C if 70, D if over 60 and F if 60 or under.

Required HW 6.2 Build your own Tic Tac Toe game from scratch! Send to me as an attached file.

How complicated can formulas get in a spreadsheet? How many levels of nesting and connecting can there be?

Here are some of the other formulas in the same Athletics spreadsheet.

=IF(C3="","",IF(AND(NOW()-1>C3,I3=""),"x",""))

=IF(N2="x","",IF(C2="","",IF(OR(G2="",H2=""),"",IF(Unmatched!A2="",IF(COUNTIF(O :O,C2&VLOOKUP(E2,SchoolList!A:B,2)&H2&VLOOKUP(D2,SchoolList!A:B,2)&G2) =0,"x",""),

=IF(C20="","", IF(N20="x","",IF(COUNTIF(R:R,R20)=2,"","x"))) notice another nested IF statement

=IF(C12="","",IF(COUNTIF(League!A:A,D12)+COUNTIF(League!A:A,E12)=2,"","x"))

=IF(C6="","",

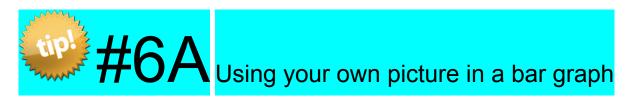
IF(F6="home",C6&VLOOKUP(D6,SchoolList!A:B,2)&(VLOOKUP(E6,SchoolList!A:B,2)),IF(F6="away",C6&VLOOKUP(E6,SchoolList!A:B,2)&(VLOOKUP(D6,SchoolList!A:B,2),IF(VLOOKUP(D6,SchoolList!A:B,2)<br/>&(VLOOKUP(D6,SchoolList!A:B,2),IF(VLOOKUP(D6,SchoolList!A:B,2)<br/><VLOOKUP(E6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),C6&VLOOKUP(E6,SchoolList!A:B,2)&VLOOKUP(D6,SchoolList!A:B,2),D))))

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We now end our course with a few more miscellaneous Excel tricks that I have not yet shared with you but should become part of your repertoire. I ask that you try each one. Nothing needs to be turned in.



Changing a bar graph to include a picture of your choice as the unit This is called a PICTOGRAPH.

Explanation: you can paste a graphic into the bar graph by choosing FORMAT DATA SERIES after you create the initial bar graph. Then one of the subchoices under FILL is called PICTURE OR TEXT. You choose the picture you want and then can indicate the SCALE with how many units per picture.

	Format Data Series
S Options	Solid Gradient Picture or Texture Pattern
Axis Error Bars	From file: Choose Picture
<ul> <li>Fill</li> <li>Line</li> <li>Shadow</li> </ul>	From texture: Choose Texture
Glow & Soft Edges	Transparency: 0
	<ul> <li>Stretch</li> <li>Stack</li> <li>Stack and scale with: 1.0 Units/Picture</li> </ul>

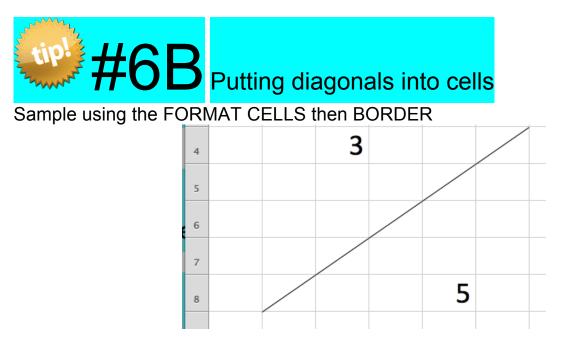
Here is the final result. See the sample on our Lesson 6 Worksheets file.

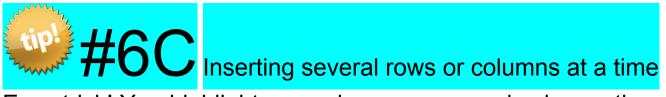
	A B	С	D	E	F	G	Н	1	J	K	L	M	N	0
1 2		Length	of W	ord					L	ength of	Word			
3	Robb	4			8									
4	Deborah	7			7									
5	Michael	7							2		20			
6	Steve	5			6									
7					5			Pyr ner youd						
8 9					- 1			-						
10									05.4		S. 60.			5.4
10 11 12					4			Pyr nervest	Surger State		te averyone av		Pys corryand	
12								-						
13 14									05.4					24
14					3	Pyr corryand		For noryand	and a		ve averyond		Fye overyand	1000
15 16									-					
17								- A	20					2.4
18					2	Pyr corryand		Fyr neryand	and a second		we avery see		Fye overyand	1000
19									-					
20 21								- A	23 H				- 4	2.
21					1	Bye nory and		Pyr noryced	and a		te ora hand		Pye over yord	1000
23									-		-			
24									2.					1
25 26					0	Bye nerved and		Pys overyand	1000		he waysed		Pys coryand	2
26						Robb		Debor	ah		Michael		Steve	



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Easy trick! You highlight several rows or several columns then choose INSERT ROWS or INSERT COLUMNS. If you highlight 5 rows then choose INSERT ROWS, you get 5 rows inserted. If you highlight 7 columns then choose INSERT COLUMNS you get 7 columns.

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This is an easy way to graph data within your spreadsheet. Sparklines are small charts that fit inside individual cells in a sheet.

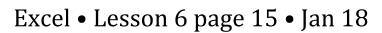
	Α	В	С	D	E
1		TEST 1	TEST 2	TEST 3	
2	Kevin	88	99	88	$\sim$
3	Larry	67	78	89	_
4	Robert	99	88	66	/
-					

How is this done?

STEP 1: you highlight B2:D4 and then choose INSERT SPARKLINES under the INSERT MENU

STEP 2: then when it asks you where to place the sparklines, you highlight the 3 cells where you want the mini-graphs to appear, e.g. you highlight E2 through E4

	Insert Sparklines
	Select a data range for the sparklines: B2:D4 Select where to place sparklines:
Learn abou	ut sparklines Cancel OK





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That's it, Whitney!

Be well everyone and hope you stay in touch. I wish you the best of success with your computer usage and your careers. Even though our 30 minute phone sessions/teaching sessions end January 31, if I can help you at some point in the next 33 years by email or a 10-15 minute phone call, I would be glad to! Be well, everyone! Steve

p.s. in a week or so, I will send you an optional end of course survey along with an optional procedure for a certificate for PD hours



## **INDEX** of **HIGHLIGHTS** can be found on the last page

☑ Required HW 6.1 Write one statement that tells a student A if over 90, B if over 80, C if 70, D if over 60 and F if 60 or under.

☑ Required HW 6.2 Build your own Tic Tac Toe game from scratch! Send to me as an attached file.

☑ Required HW 6.3 Create examples with each of these 4 tips

Tip 6A: Using your own picture in a bar graph

Tip 6B: Putting diagonals into cells

Tip 6C: Inserting several rows or columns at a time

Tip 6D: Inserting Sparklines

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### OPTIONAL SOLUTION TO LESSON 5 CHALLENGE PROBLEM BY JONAH FROM CA, April 2015

### Here is the data with no formulas visible

	Α	В	С	D	E		G	Η	1	J	К		L
				MONEY									
1	CODE	DATE	COST	Remaining	NAME	CAT	CAT Name			1	Car	s	50.00
2	4001	1/1/15	\$100	\$32,900.00	STUBHUB (Pacers vs. Celtics Ticket)	8	Entertainment			2	Phone/Internet	S	75.00
3	4002	1/1/15	\$10	\$32,890.00	CHIPOTLE (Burrito Bowl)	5	Food			3	Software	\$	5.00
4	4003	1/1/15	\$300		Dr. Phil Jackson (Psychiatrist)	9	Doctors			4	Supplies	S	15.00
5	4004	1/2/15	\$15	\$32,575.00	STAPLES (Printer Paper)	4	Supplies			5	Food	\$	10.00
6	4005	1/2/15	\$50		JIFFY LUBE (Oil Change & Tire Rotation)	1	Car			6	Publicity	S	95.00
7	4006	1/3/15	\$75		VERIZON (Monthly Fee)	2	Phone/Internet			- 7	Insurance	S	500.00
8	4007	1/4/15	\$5	\$32,445.00	APPLE STORE (2015 Excel App)	3	Software			8	Entertainment	\$	100.00
9	4008	1/4/15	\$500	\$31,945.00	STATE FARM (Flood Insurance)	7	Insurance			9	Doctors	S	300.00
10	4009		\$95		Creative Artists Agency (New Headshots for Autographs)		Publicity			10	Travel	\$2	,000.00
11	4010	1/6/15	\$2,000	\$29,850.00	DELTA (First Class Ticket to Naples, FL for Charity Golf Tourney)	10	Travel						
12													

### Here are the formulas

- 4	A	B	C	D	E	F	G	HI	J	K	L
				MONEY							
1	CODE	DATE	COST	Remaining	NAME	CA	CAT Name		1	Car	=SUMIF(F:F, "1",C:C)
2	4001	40543	100	=33000-C2	STUBHUB (Pacers vs. Celtics Ticket)	8	=LOOKUP(\$F2,J\$1:J\$10,K\$1:K\$11)		2	Phone/Internet	=SUMIF(F:F, "2",C:C)
3	4002	40543	10	=D2-C3	CHIPOTLE (Burrito Bowl)	5	=LOOKUP(\$F3,J\$1:J\$10,K\$1:K\$11)		3	Software	=SUMIF(F:F, "3",C:C)
4	4003	40543	300	=D3-C4	Dr. Phil Jackson (Psychiatrist)	9	=LOOKUP(\$F4,J\$1:J\$10,K\$1:K\$11)		4	Supplies	=SUMIF(F:F, "4",C:C)
5	4004	40544	15	=D4-C5	STAPLES (Printer Paper)	4	=LOOKUP(\$F5,J\$1:J\$10,K\$1:K\$11)		5	Food	=SUMIF(F:F, "5",C:C)
6	4005	40544	50	=D5-C6	JIFFY LUBE (Oil Change & Tire Rotation)	1	=LOOKUP(\$F6,J\$1:J\$10,K\$1:K\$11)		6	Publicity	=SUMIF(F:F, "6",C:C)
7	4006	40545	75	=D6-C7	VERIZON (Monthly Fee)	2	=LOOKUP(\$F7,J\$1:J\$10,K\$1:K\$11)		7	Insurance	=SUMIF(F:F, "7",C:C)
8	4007	40546	5	=D7-C8	APPLE STORE (2015 Excel App)	3	=LOOKUP(\$F8,J\$1:J\$10,K\$1:K\$11)		8	Entertainment	=SUMIF(F:F, "8",C:C)
9	4008	40546	500	=D8-C9	STATE FARM (Flood Insurance)	7	=LOOKUP(\$F9,J\$1:J\$10,K\$1:K\$11)		9	Doctors	=SUMIF(F:F, "9",C:C)
10	4009	40547	95	=D9-C10	Creative Artists Agency (New Headshots for Autographs)	6	=LOOKUP(\$F10,J\$1:J\$10,K\$1:K\$11)		10	Travel	=SUMIF(F:F, "10",C:C)
11	4010	40548	2000	=D10-C11	DELTA (First Class Ticket to Naples, FL for Charity Golf Tourney)	10	=LOOKUP(\$F11,J\$1:J\$10,K\$1:K\$11)				
12											

And here is a closeup of columns J-K-L so we can see the critical, clever formula in L1 that uses the SUMIF command that looks in column F for entries that are of a specific category number and then ADDS UP the numbers in column C.

J	K	L
1	Car	=SUMIF(F:F, "1",C:C )
2	Phone/Internet	=SUMIF(F:F, "2",C:C)
3	Software	=SUMIF(F:F, "3",C:C)
4	Supplies	=SUMIF(F:F, "4",C:C)
5	Food	=SUMIF(F:F, "5",C:C)
6	Publicity	=SUMIF(F:F, "6",C:C )
7	Insurance	=SUMIF(F:F, "7",C:C )
8	Entertainment	=SUMIF(F:F, "8",C:C )
9	Doctors	=SUMIF(F:F, "9",C:C )
10	Travel	=SUMIF(F:F, "10",C:C)