# Excel • Lesson 6 page $1 \cdot$ Jan 18 

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

## 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.

| 1 | A | B | C | D | E | F | G | H | I | J |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 |  |  |  |  |  | TEAM | 0 |  |  |  |
| 2 |  |  |  |  |  | TEAM | X |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |

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 $=C O U N T I F(C \$ 3: E \$ 5, " O ")$ or perhaps $=C O U N T I F(C \$ 3: E \$ 5, G 1)$. 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 | B | C | D | E | F | G | H | 1 | J |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 |  |  |  |  |  | TEAM | 0 |  | 0 | moves so far |
| 2 |  |  |  |  |  | TEAM | X |  | 0 | moves so far |
| 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.

## Define Name



## Refers 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 H 3 should do it.
=IF(I1<l2,"Team O to move","Team X to move")

This way if $I 1=12$, 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.

| - | A | B | C | D | E | F | G | H | 1 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 | A | B | C | D | E | F | G | H | J |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 |  |  |  |  |  | TEAM | 0 |  | moves so far |  |
| 2 |  |  |  |  |  | TEAM | X | 2 | moves so far |  |
| 3 |  |  |  |  | 入 |  |  | Team 0 | to move |  |
| 4 |  |  |  | $X$ |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 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 $=A N D(C 3=D 3, D 3=E 3, E 3=G 2)$
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 G 2 .

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.


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.


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 | B | C | D | E | F | G | H | I | J |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 |  |  |  |  |  | TEAM | 0 |  | 4 | moves so far |  |
| 2 |  |  |  |  |  | TEAM | X |  | 5 | moves so far |  |
| 3 |  |  | X | 0 | X | FALSE |  | Tea | 0 | to move |  |
| 4 |  |  | $\lambda$ | N |  | FALSE |  |  |  |  |  |
| 5 |  |  | , |  |  | FALSE |  |  |  |  |  |
| 6 |  | TRUE | TRUE | FALSE | FALSE | FALSE |  |  |  |  |  |

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

|  | A | B | C | D | E | F | G | H I | J |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 |  |  |  |  |  | TEAM | 0 | =COUNTIF(TheBoard,G1) | moves so far |
| 2 |  |  |  |  |  | TEAM | X | =COUNTIF(TheBoard,G2) | moves so far |
| 3 |  |  | $X$ |  | $X$ | $=\mathrm{AND}(\mathrm{C} 3=\mathrm{D} 3, \mathrm{D} 3=E 3, E 3=G \$ 2)$ |  | =\|F(11<l2,"Team O to move", "Team X to mo | e") |
| 4 |  |  | X | X |  | $=\mathrm{AND}(\mathrm{C4}=\mathrm{D} 4, \mathrm{D} 4=E 4, E 4=\mathrm{G} \$ 2$ ) |  |  |  |
| 5 |  |  | $X$ |  |  | =AND(C5=D5, $\mathrm{D} 5=\mathrm{E5}, \mathrm{E5}=\mathrm{G} \$ 2$ ) |  |  |  |
| 6 |  | $=\mathrm{AND}(\mathrm{C5}=\mathrm{D} 4, \mathrm{D} 4=\mathrm{E} 3, \mathrm{E} 3=\mathrm{G} 2)$ | =AND(C3=C4,C4=C5,C5=\$G2) | =AND(D3=D4, D4 = D5, D5=\$G2) | =AND(E3=E4,E4=E5,E5=\$G2) | $=\mathrm{AND}(\mathrm{C3}=\mathrm{D} 4, \mathrm{D} 4=\mathrm{E} 5, \mathrm{E} 5=\mathrm{G} 2)$ |  |  |  |
| 7 |  |  |  |  |  |  |  |  |  |

which may be hard for you to read so I will split it into 2 pieces for you.
Here are columns A-E.

| $\triangle$ | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  | X | $0$ | X |
| 4 |  |  | X | $X$ |  |
| 5 |  |  |  | 0 |  |
| 6 |  | =AND(C5=D4,D4=E3,E3=G2) | =AND(C3=C4,C4=C5,C5=\$G2) | =AND(D3=D4,D4=D5,D5=\$G2) | $=\mathrm{AND}(\mathrm{E} 3=E 4, E 4=E 5, E 5=\$ \mathrm{G} 2)$ |

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Here are columns F-J.

| F | G | H | I | J |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| TEAM | 0 |  | =COUNTIF(TheBoard,G1) | moves so far |  |
| TEAM | X |  | =COUNTIF(TheBoard,G2) | moves so far |  |
| $=\mathrm{AND}(\mathrm{C3}=\mathrm{D} 3, \mathrm{D} 3=\mathrm{E} 3, \mathrm{E} 3=\mathrm{G} \$ 2)$ |  | $=1 \mathrm{~F}(11<12$, "Team O to move", "Team X to move") |  |  |  |
| $=\mathrm{AND}(\mathrm{C4}=\mathrm{D} 4, \mathrm{D} 4=\mathrm{E4}, \mathrm{E} 4=\mathrm{G} \$ 2)$ |  |  |  |  |  |
| $=\mathrm{AND}(\mathrm{C} 5=\mathrm{D} 5, \mathrm{D} 5=\mathrm{E}, \mathrm{E} 5=\mathrm{G} \$ 2)$ |  |  |  |  |  |
| =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 H 2 and test it.
=OR(B6,C6,D6,E6,F6,F5,F4,F3)

|  | B | C | D | E | 5 | G | H | I | J | K |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 |  |  |  |  | TEAM | 0 |  | 4 | move |  |
| 2 |  |  |  |  | TEAM | X | TRUE | 5 | move |  |
| 3 |  | X | O |  | FALSE |  | Team | mo |  |  |
| 4 |  | X | $\lambda$ |  | FALSE |  |  |  |  |  |
| 5 |  | $\lambda$ |  |  | FALSE |  |  |  |  |  |
| 6 | TRUE | TRUE | FALSE | FALSE | FALSE |  |  |  |  |  |

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Now I blank out cell C5 and notice how H 2 changes to FALSE.

|  | B | C | D | E | F | G | H | I | J | K |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 |  |  |  |  | TEAM | 0 |  | 4 | mov |  |
| 2 |  |  |  |  | TEAM | X | FALSE | 4 | mov |  |
| 3 |  | X |  |  | FALSE |  | Team | mov |  |  |
| 4 |  | K | > |  | FALSE |  |  |  |  |  |
| 5 |  |  |  |  | FALSE |  |  |  |  |  |
| 6 | FALSE | FALSE | FALSE | FALSE | FALSE |  |  |  |  |  |

But what I really want in cell H 2 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.


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And if I show the formulas, we have

and


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 .


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 $C 2=$ "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

|  | A | B | C | 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 | B | C | D |
| :---: | :---: | :---: | :---: | :---: |
| 1 | Date | Temperature | Weather | Good/Bad |
| 2 | 42036 | =RANDBETWEEN $(30,60)$ | =CHOOSE(RANDBETWEEN(1,2),"Sun","Rain") | $=1 F($ 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") | $=1 F($ AND (B6>50,C6="sun"),"GO OUTSIDE", "STAY INSIDE") |
| 7 | 42041 | =RANDBETWEEN $(30,60)$ | =CHOOSE(RANDBETWEEN(1,2),"Sun","Rain") | $=1 F(A N D(B 7>50, C 7=" s u n "), "$ 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 | B | C | 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

| 1 | 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", ${ }^{\text {" }}$ " $)$ |
| 3 | =CHOOSE(RANDBETWEEN(1,4),"Test","Paper","Quiz","Homework") | 95 | ok | $=1 F\left(O R(B 3<70, C 3="\right.$ poor" $), "$ Meet with teacher", ${ }^{\prime \prime \prime \prime}$ ) |
| 4 | =CHOOSE(RANDBETWEEN(1,4),"Test","Paper", "Quiz","Homework") | 69 | ok | =IF(OR(B4<70,C4="poor"),"Meet with teacher", ${ }^{\text {" }}$ " $)$ |
| 5 | =CHOOSE(RANDBETWEEN(1,4),"Test","Paper","Quiz","Homework") | 89 | poor | =IF(OR(B5<70,C5="poor"),"Meet with teacher", ${ }^{\text {" }}$ " $)$ |
| 6 | =CHOOSE(RANDBETWEEN(1,4),"Test","Paper","Quiz","Homework") | 91 | ok | =IF(OR(B6<70,C6="poor"),"Meet with teacher", ${ }^{\text {"'" }}$ ) |

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.


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 $\mathrm{G} 3=\mathrm{H} 3$ we want to type "tie" in the box. Well now consider the yellow portion.
=IF(G3="","",IF(H3="","",IF(G3>H3,"win",IF(H3>G3,"loss",IF(G3=H3,"tie")))))

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 $\mathrm{G} 3>\mathrm{H} 3$ 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"))

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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.


Using your own picture in a bar graph

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


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


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Sample using the FORMAT CELLS then BORDER

| 4 |  |  | 3 |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 5 |  |  |  |  |  |
| 6 |  |  |  |  |  |
| 7 |  |  |  |  |  |
| 8 |  |  |  |  |  |
|  |  |  | 5 |  |  |



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

|  | A | B | c | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 |  | TEST 1 | TEST 2 | TEST 3 |  |
| 2 | Kevin | 88 | 99 | 88 | 人 |
| 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


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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

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

| - | A | B | C | D | E | F | G | H | 1 | J | K | L |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | CODE | DATE | COST | MONEY <br> Remaining | NAME | CAT | CAT Name |  |  | 1 | Car | \$ 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 | S 5.00 |
| 4 | 4003 | 1/1/15 | \$300 | \$32,590.00 | Dr. Phil Jackson (Psychiatrist) | 9 | Doctors |  |  | 4 | Supplies | \$ 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 | \$32,525.00 | JIFFY LUBE (Oil Change \& Tire Rotation) | 1 | Car |  |  | 6 | Publicity | \$ 95.00 |
| 7 | 4006 | 1/3/15 | \$75 | \$32,450.00 | VERIZON (Monthly Fee) | 2 | Phone/Internet |  |  | 7 | Insurance | S 500.00 |
| 8 | 4007 | 1/4/15 | S5 | \$32,445.00 | APPLE STORE (2015 Excel App) | 3 | Software |  |  | 8 | Entertainment | S 100.00 |
| 9 | 4008 | 1/4/15 | \$500 | \$31,945.00 | STATE FARM (Flood Insurance) | 7 | Insurance |  |  | 9 | Doctors | S 300.00 |
| 10 | 4009 | 1/5/15 | S95 | \$31,850.00 | Creative Artists Agency (New Headshots for Autographs) | 6 | 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


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.

| 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 ) |
| $\mathbf{6}$ | 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 ) |
| $\mathbf{1 0}$ | Travel | $=$ SUMIF(F:F, "10",C:C $)$ |


[^0]:    =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)<VLOOKUP(E6,SchoolList!A:B,2),C6\&VLOOKUP(D6 ,SchoolList!A:B,2)\&VLOOKUP(E6,SchoolList!A:B,2),C6\&VLOOKUP(E6,SchoolList!A:B,2)\&VLOOKUP(D6,SchoolList!A:B,2)))))

