



Excel: Dates and Pivot Tables - Temporal Heat Map

Summary by Kaitlyn Campbell and Hannah Steinman

This guide will walk you through making pivot tables for your data! The first three steps of the guide will walk you through separating the date and time, and populating day of week from one column to three. It will then walk you through making pivot tables for your data which make it easier to visualize and then analyze. The dataset used in this tutorial is alcohol related offenses from the Fayetteville Police Department 2017- 2019.

1. Before we start making pivot tables, we want to separate our date from the time. Label a new column for "Date". To begin separating the date, you will click the first cell in the new Date column. You will type the formula "**=INT**" and click the cell you want to separate. Hit enter and you will see that the date has separated. Double click the **bottom right corner** of the new cell to populate the rest of the dates in the column. The next step walks you through changing the format of the cells to represent the date, rather than a number.

	A	B	C
1	Case Address	Case Offense Statute Description	Case Reported Date And Time
2	W DICKSON ST / N LOCUST AVE	DUI - UNDER 21	01/16/2017 23:54:00
3	W MILLER ST / N GREGG AVE	DUI - UNDER 21	02/08/2017 00:16:00
4	1535 N COLLEGE AVE	DUI - UNDER 21	02/11/2017 03:33:00
5	W WEDINGTON DR / N 46TH AVE	DUI - UNDER 21	03/25/2017 22:49:00
6	S STADIUM DR / W BULLDOG BLVD	DUI - UNDER 21	04/01/2017 23:25:00
7	E JOYCE BLVD / N PARKVIEW DR	DUI - UNDER 21	04/25/2017 02:11:00

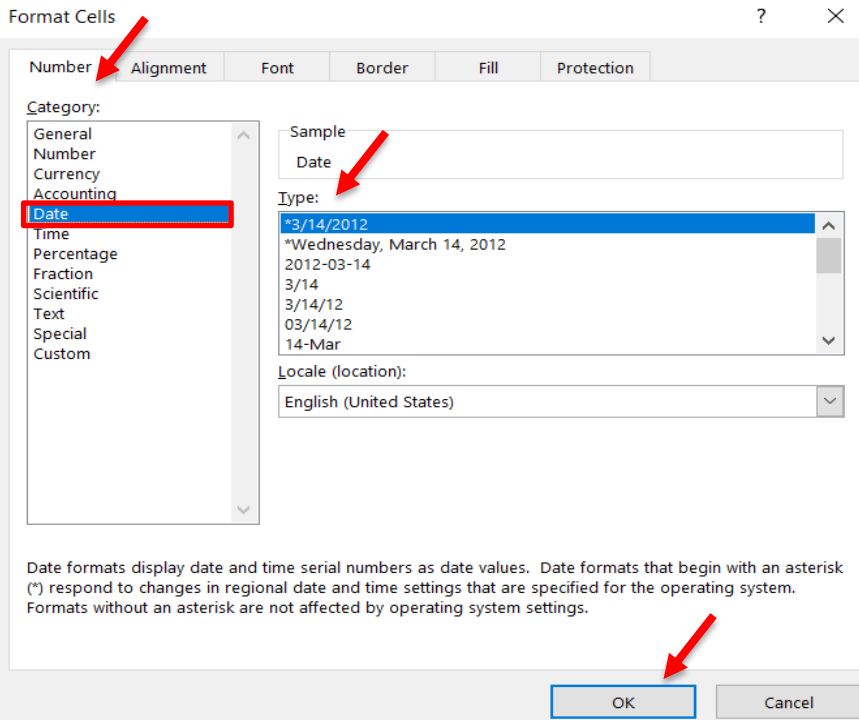
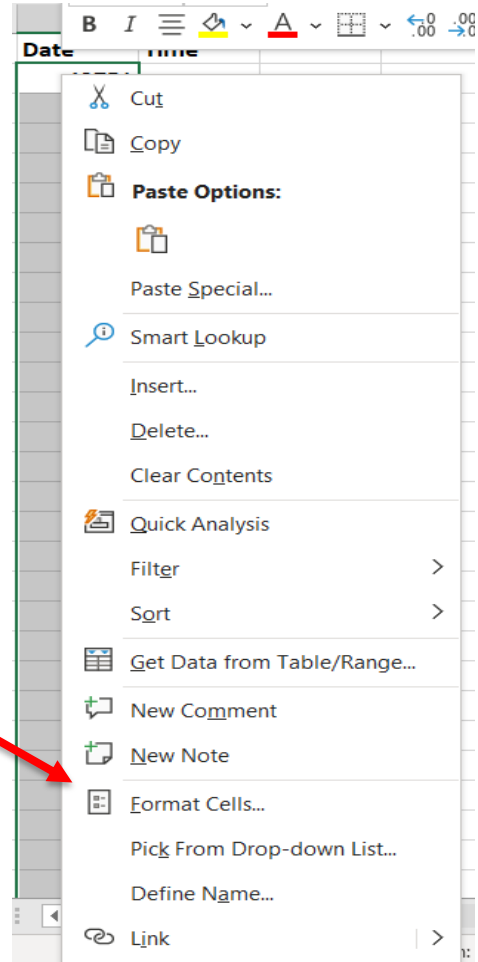
C	D	E
Case Reported Date And Time	Date	Time
01/16/2017 23:54:00	=INT(C2)	
02/08/2017 00:16:00	INT(number)	
02/11/2017 03:33:00		
03/25/2017 22:49:00		

C	D
Case Reported Date And Time	Date
01/16/2017 23:54:00	42751
02/08/2017 00:16:00	
02/11/2017 03:33:00	

C	D
Case Reported Date And Time	Date
01/16/2017 23:54:00	42751
02/08/2017 00:16:00	42774
02/11/2017 03:33:00	42777
03/25/2017 22:49:00	42819
04/01/2017 23:25:00	42826
04/25/2017 02:11:00	42850
05/18/2017 00:05:24	42873
05/24/2017 02:30:43	42879
06/15/2017 00:57:00	42901
06/24/2017 00:20:00	42910
06/25/2017 04:16:00	42911
08/10/2017 01:21:00	42957
08/31/2017 22:25:08	42978

Highlight and right click the newly populated date column. Click **Format Cells**. A new screen will pop up where, on the right-hand side under **Category**, you will choose **Date** as the format. You will then be able to choose how you want the date displayed under **Type** and click **OK**. Your date should now be changed! Now we will begin the time separation.

C	D
Case Reported Date And Time	Date
01/16/2017 23:54:00	42751
02/08/2017 00:16:00	42774
02/11/2017 03:33:00	42777
03/25/2017 22:49:00	42819
04/01/2017 23:25:00	42826
04/25/2017 02:11:00	42850
05/18/2017 00:05:24	42873
05/24/2017 02:30:43	42879
06/15/2017 00:57:00	42901
06/24/2017 00:20:00	42910
06/25/2017 04:16:00	42911
08/10/2017 01:21:00	42957
08/31/2017 22:25:08	42978



C	D
Case Reported Date And Time	Date
01/16/2017 23:54:00	1/16/2017
02/08/2017 00:16:00	2/8/2017
02/11/2017 03:33:00	2/11/2017
03/25/2017 22:49:00	3/25/2017
04/01/2017 23:25:00	4/1/2017
04/25/2017 02:11:00	4/25/2017
05/18/2017 00:05:24	5/18/2017

2. We are going to follow a similar process as we did with the date. Click the cell you want the first time to be, you will start the formula by typing "**= C2 - INT(C2)**". **Replace C2 with the cell your data is located in**. This formula subtracts the date from the time. You will then double click the bottom right hand corner to auto populate the rest of the times. Highlight and right click the data, go to **Format Cells** and choose **Time**. Click **OK**, this will display your data as time.

C	D	E
Case Reported Date And Time	Date	Time
01/16/2017 23:54:00	1/16/2017	=C2-INT(C2)
02/08/2017 00:16:00	2/8/2017	

Formula: =cell - INT(cell)

C	D	E
Case Reported Date And Time	Date	Time
01/16/2017 23:54:00	1/16/2017	0.99583333
02/08/2017 00:16:00	2/8/2017	
02/11/2017 03:33:00	2/11/2017	

Double click to populate column

Format Cells

Number Alignment Font Border Fill Protection

Category:

- General
- Number
- Currency
- Accounting
- Date
- Time**
- Percentage
- Fraction
- Scientific
- Text
- Special
- Custom

Sample: 11:54:00 PM

Type:

- *1:30:55 PM
- 13:30
- 1:30 PM
- 13:30:55
- 1:30:55 PM
- 30:55.2
- 37:30:55

Locale (location): English (United States)

You can also choose Military Time

C	D	E
Case Reported Date And Time	Date	Time
01/16/2017 23:54:00	1/16/2017	11:54:00 PM
02/08/2017 00:16:00	2/8/2017	12:16:00 AM
02/11/2017 03:33:00	2/11/2017	3:33:00 AM
03/25/2017 22:49:00	3/25/2017	10:49:00 PM
04/01/2017 23:25:00	4/1/2017	11:25:00 PM
04/25/2017 02:11:00	4/25/2017	2:11:00 AM
05/18/2017 00:05:24	5/18/2017	12:05:24 AM
05/24/2017 02:30:43	5/24/2017	2:30:43 AM
06/15/2017 00:57:00	6/15/2017	12:57:00 AM
06/24/2017 00:20:00	6/24/2017	12:20:00 AM
06/25/2017 04:16:00	6/25/2017	4:16:00 AM

- Next, we will populate the day of the week. In a new column, you will type the formula **"=TEXT(C2, "dddd")**. Again, **replace C2 with the cell that contains your data**. This formula gives you the full day of the week; you can also enter **"ddd"** for the abbreviation of the day. After you enter the formula, you will then double click the bottom right corner to populate the rest of the column. You have separated the date, time, and day.

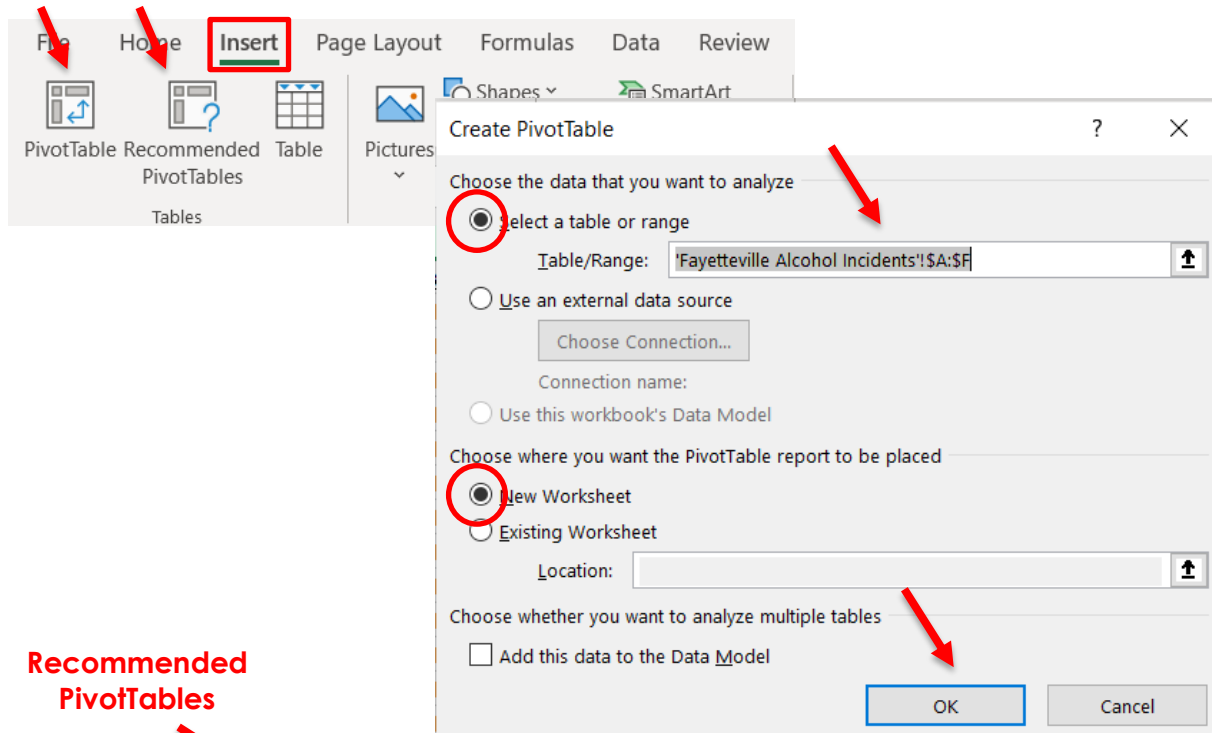
Formula: =TEXT(cell, "dddd")

C	D	E	F
Case Reported Date And Time	Date	Day	Time
01/16/2017 23:54:00	1/16/2017	=TEXT(C2, "dddd")	
02/08/2017 00:16:00	2/8/2017		12:16:00 AM
02/11/2017 03:33:00	2/11/2017		3:33:00 AM
03/25/2017 22:49:00	3/25/2017		10:49:00 PM

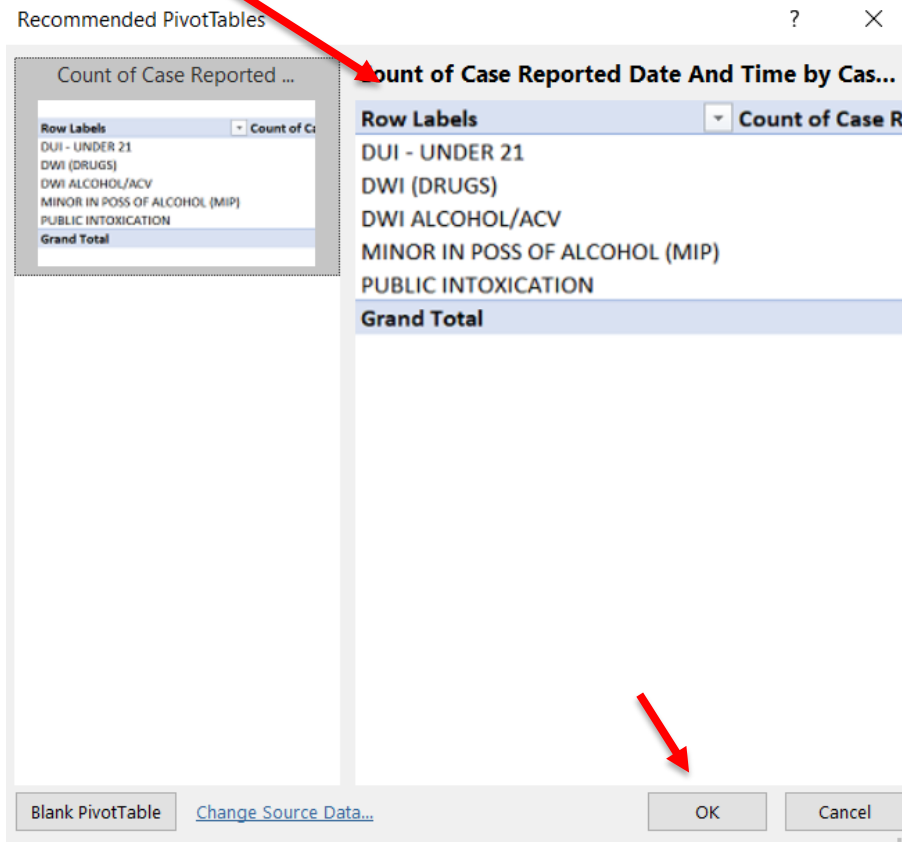
C	D	E	F
Case Reported Date And Time	Date	Day	Time
01/16/2017 23:54:00	1/16/2017	Monday	11:54:00 PM
02/08/2017 00:16:00	2/8/2017	Wednesday	12:16:00 AM
02/11/2017 03:33:00	2/11/2017	Saturday	3:33:00 AM
03/25/2017 22:49:00	3/25/2017	Saturday	10:49:00 PM
04/01/2017 23:25:00	4/1/2017	Saturday	11:25:00 PM

The next half of the guide will walk you through creating a pivot table for your data.

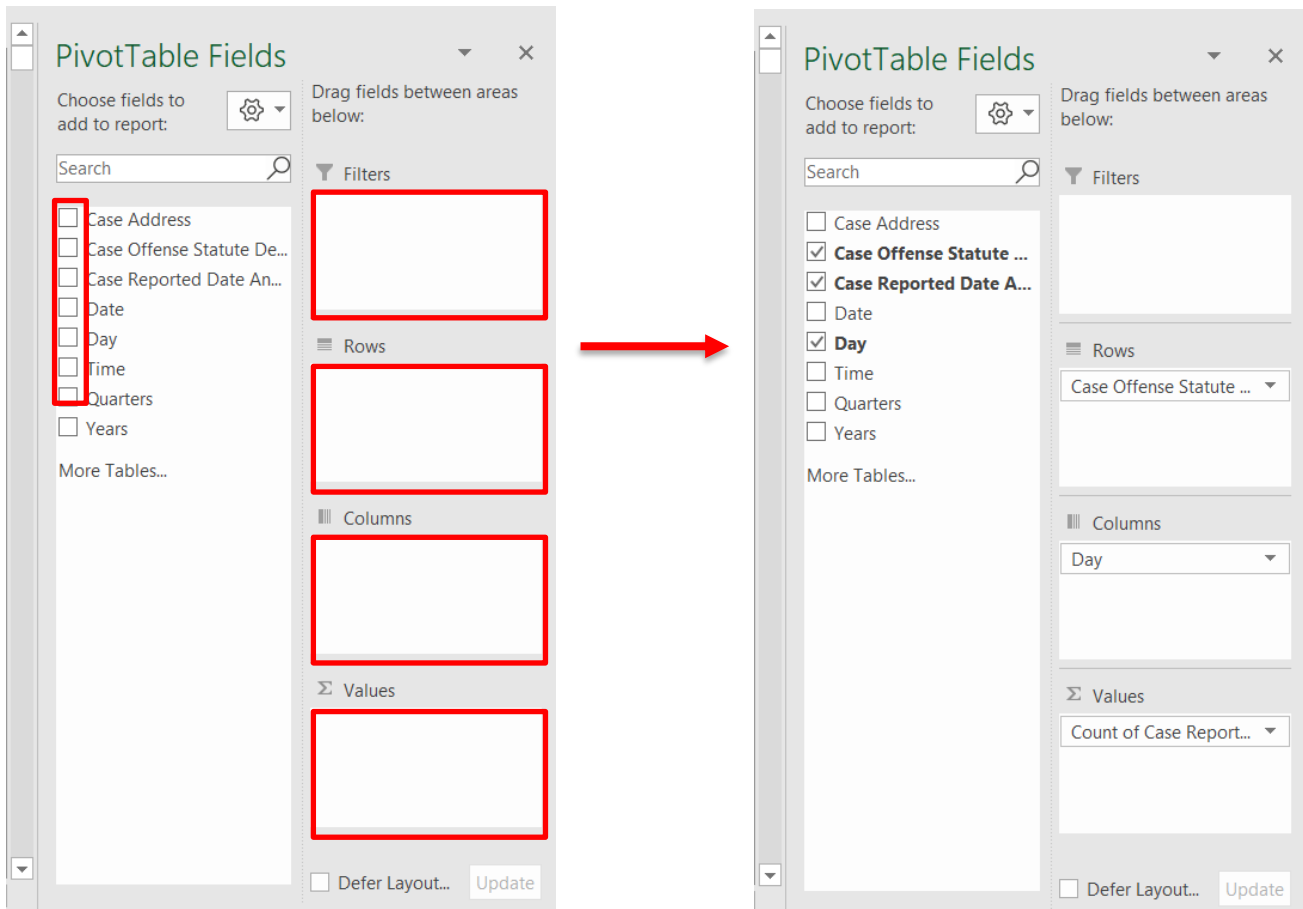
4. To create a pivot table, go to the **Insert** tab in the top left of the screen. Click **Pivot Table**. A pop-up will appear where you will click **Select a table or range** where you can then enter the range of data you want to include, you can also highlight the columns you want to use. Click **New Worksheet** and then **OK**. Alternatively, you can click **Recommended PivotTables** where pivot tables are automatically generated



**Recommended
PivotTables**



5. When you go to the new sheet, you will notice your data on the righthand side of the screen. Here, you can display your data by checking the boxes and dragging them to any of the fields on the far right. How your data are displayed is up to you!

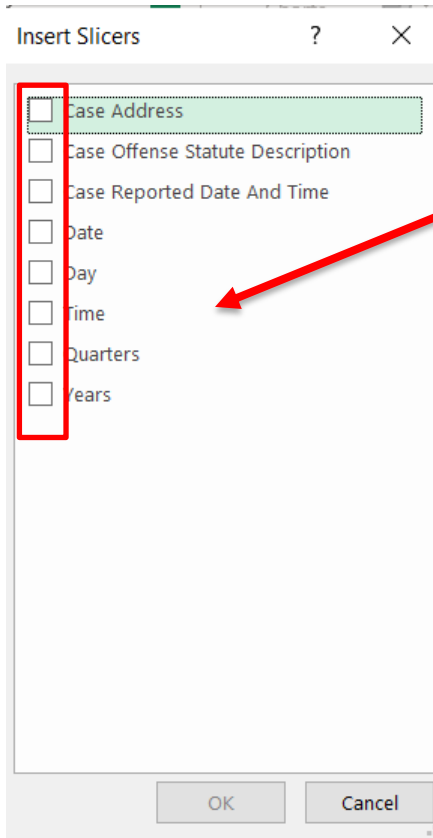
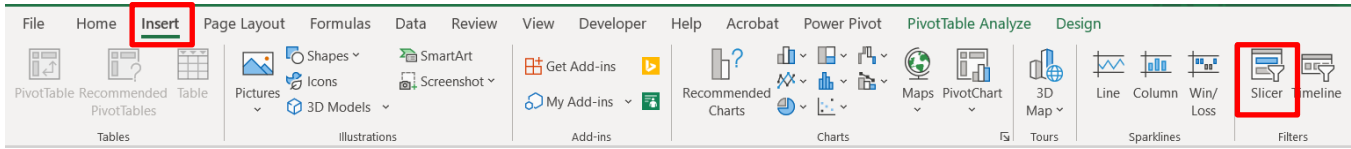


Here, we can see the counts of each offense per day of the week.... but how do we see

Count of Case Reported Date And Time	Column Labels	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total
DUI - UNDER 21		9	3	3	5	6	4	16	46
DWI (DRUGS)		27	33	28	27	31	31	25	202
DWI ALCOHOL/ACV		306	104	93	148	160	244	352	1407
MINOR IN POSS OF ALCOHOL (MIP)		69	21	20	38	52	102	121	423
PUBLIC INTOXICATION		380	223	215	246	283	364	508	2219
Grand Total		791	384	359	464	532	745	1022	4297

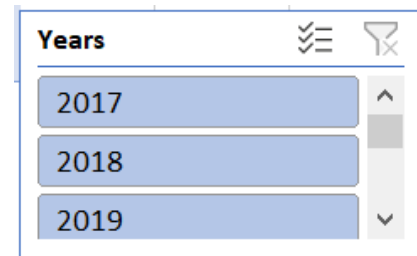
counts per year? Remember, the data are from 2017 through 2019 (3 years)

6. Now we have our data displayed with offenses and counts per day, but we want to add year. There is a nifty way to do this through using a **slicer**. Go to **Insert** and click **Slicer**. You will be able to choose the data you want to filter by with interactive buttons as shown below!



Choose which data to filter by

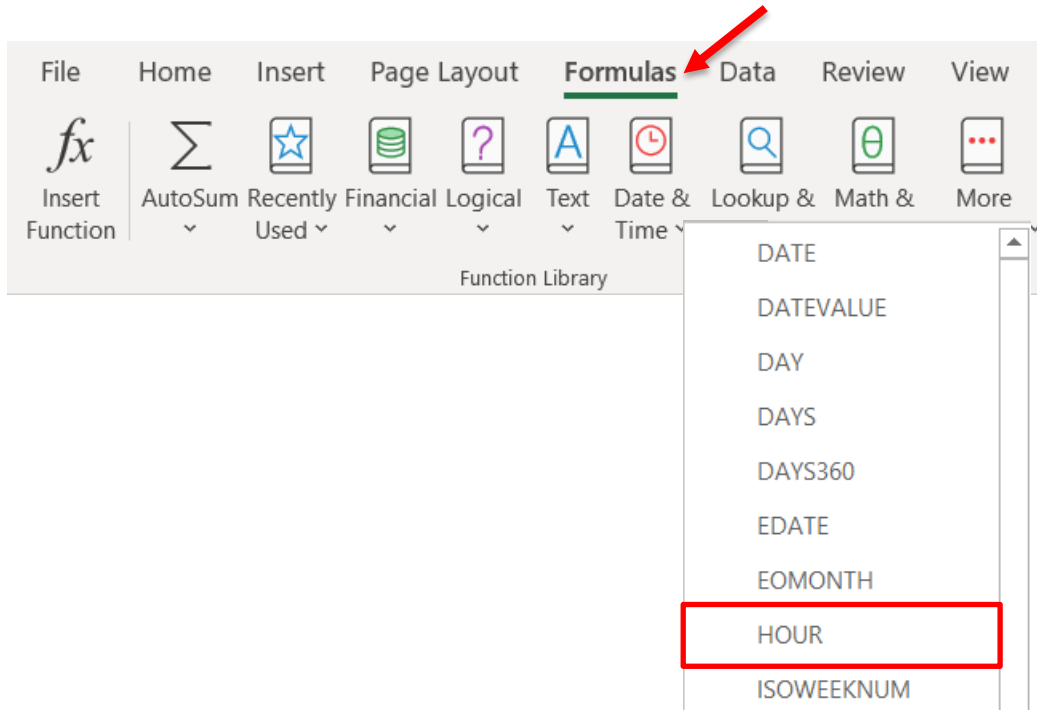
Interactive buttons



Cool interactive way to display your data!

Count of Case Reported Date And Time	Column Labels	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total
DUI - UNDER 21		2		2				1	5
DWI (DRUGS)		1	3	1	2	5	2	4	18
DWI ALCOHOL/ACV		37	11	14	10	19	21	43	155
MINOR IN POSS OF ALCOHOL (MIP)		15	2	9	2	8	15	13	64
PUBLIC INTOXICATION		38	31	30	26	33	40	66	264
Grand Total		93	47	56	40	65	78	127	506

7. Now we will make a new pivot table that will break down data by offense, day, and hour. First, we need a new field for **Hour**. We will go back to our original sheet and in a new field, click the first cell that we want to populate the hour in for the **Serial_number**. Go to **Formulas**, click **Date & Time**, then **Hour**. Click the cell that has the full time in it and hit enter. The new field's first cell should just have the hour. You will then double-click the bottom right hand corner to populate the rest of the column.



Function Arguments

HOUR

Serial_number F2 = 0.995833333
= 23

Returns the hour as a number from 0 (12:00 A.M.) to 23 (11:00 P.M.).

Serial_number is a number in the date-time code used by Microsoft Excel, or text in time format, such as 16:48:00 or 4:48:00 PM.

Formula result = 23

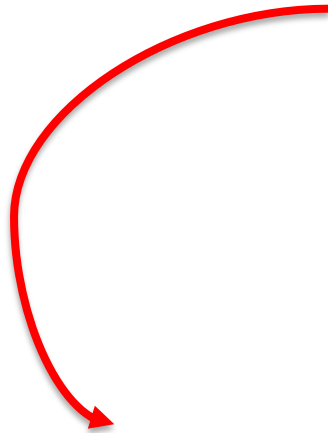
[Help on this function](#) OK Cancel

	F	G
Time		Hour
23:54:00)	
0:16:00		
3:33:00		
22:49:00		
23:25:00		
2:11:00		
0:05:24		
2:30:43		
0:57:00		

F	G
Time	Hour
23:54:00	23
0:16:00	
3:33:00	
22:49:00	
23:25:00	
2:11:00	
0:05:24	

F	G
Time	Hour
23:54:00	23
0:16:00	0
3:33:00	3
22:49:00	22
23:25:00	23
2:11:00	2
0:05:24	0

8. The next step is to insert a new pivot table with our data. Once we have the pivot sheet open, we will place our new Hour field in rows, Days in column, and our offenses as counts under values.



PivotTable Fields

Choose fields to add to report:

Drag fields between areas below:

Search

Case Address

Case Offense Statu...

Case Reported Date An...

Date

Day of the Week

Time

Hour

More Tables...

Filters

Columns

Day of the Week

Rows

Hour

Values

Count of Case Offense...

Defer Layout...

Count of Case Offense Statute Description	Column Labels								
Row Labels	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total	
0	118	30	39	44	58	81	131	501	
1	154	32	40	68	55	98	155	602	
2	204	35	31	50	53	104	162	639	
3	53	18	12	13	19	31	50	196	
4	33	4		4	14	15	30	100	
5	9		4	6	1	8	18	46	
6	7	4	3	6	1	4	5	30	
7	3	1	1	3	3	4	3	18	
8	3	8	5	3	2	2	2	25	
9	6	6	4	7	3	6	5	37	
10	5	4	3	4	5	8	14	43	
11	6	5	6	8	8	7	5	45	
12	8	8	14	4	11	11	11	67	
13	9	4	7	13	12	13	16	74	
14	9	12	13	15	11	11	12	83	
15	18	10	14	9	13	15	20	99	
16	16	19	14	19	16	12	14	110	
17	9	13	12	19	22	26	22	123	
18	18	18	13	22	18	19	34	142	
19	17	20	20	16	26	25	37	161	
20	20	31	19	12	28	29	43	182	
21	26	30	28	35	33	50	53	255	
22	24	30	29	36	63	73	72	327	
23	16	42	28	48	57	93	108	392	
Grand Total	791	384	359	464	532	745	1022	4297	

9. The data are now displayed, however we want Sunday to be after Saturday, rather than before Monday. You will hover near Sunday until you see the directional arrow symbol . You can then drag Sunday and its corresponding column after Saturday. Next, we want to add a slicer (same process as above) for our offences where we can then look at Public Intoxication offenses only by day of week and hour of day.

Count of Case Offense Statute Description	Column Labels	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total
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Column Labels
Sunday



Count of Case Offense Statute Description	Column Labels	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Grand Total
0		30	39	44	58	81	131	118	501
1		32	40	68	55	98	155	154	602
2		35	31	50	53	104	162	204	639

View Developer Help Insert Slicers ? X

Case Address
 Case Offense Statute Description
 Case Reported Date And Time
 Date
 Day of the Week
 Time
 Hour

D	E	F
Wednesday	Thursday	Friday
44	58	
68	55	
50	53	11
13	19	
4	14	
6	1	
6	1	
3	3	
3	2	

OK Cancel

Case Offense Stat...  

DUI - UNDER 21

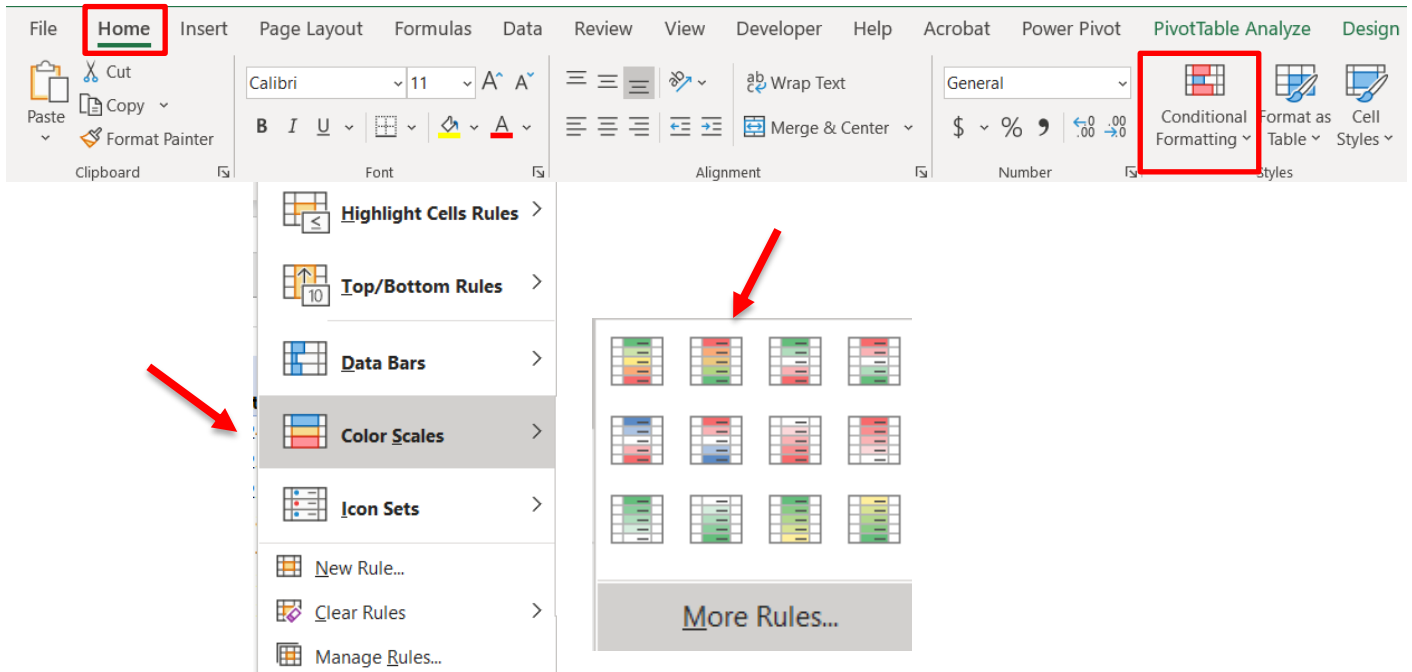
DWI (DRUGS)

DWI ALCOHOL/ACV

MINOR IN POSS OF ALC...

PUBLIC INTOXICATION

10. Now we have Public Intoxication offenses displayed by hour and day! We can also better display our data visually through conditional formatting that will show us the days of the week that had more public intoxications via color scale. You will **highlight the data**, go to the **Conditional Formatting** tab, click **color scales**. We want our data with the highest count to be displayed in red, so we choose the **Red-Yellow-Green** color scale.



Count of Case	Offense Statute Description	Column Labels	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Grand Total
0			12	23	25	28	31	72	54	245
1			13	18	19	19	38	77	73	257
2			12	13	15	15	43	44	81	223
3			6	6	10	11	11	19	20	83
4			2		3	8	6	12	16	47
5				3	5	1	6	11	3	29
6			4	3	4	1	2	4	4	22
7			1	1	3	1	2	2	2	12
8			3	5	2	2	1	2	1	16
9			2	2	6	3	5	5	3	26
10			2		1	4	5	9	3	24
11			4	2	6	4	4	5	6	31
12			8	10	3	6	7	8	4	46
13			2	7	10	8	10	12	6	55
14			9	7	12	9	6	9	5	57
15			6	10	7	10	13	14	13	73
16			15	11	12	10	9	7	10	74
17			10	8	12	16	9	12	6	73
18			17	8	17	15	13	20	12	102
19			17	15	12	17	21	22	13	117
20			28	14	8	20	18	21	11	120
21			14	16	12	22	27	33	15	139
22			15	16	19	26	37	37	12	162
23			21	17	23	27	40	51	7	186
Grand Total			223	215	246	283	364	508	380	2219

Case Offense Stat...

- DUI - UNDER 21
- DWI (DRUGS)
- DWI ALCOHOL/ACV
- MINOR IN POSS OF ALC...
- PUBLIC INTOXICATION

Now you can display your data in a visually pleasing and translatable way!