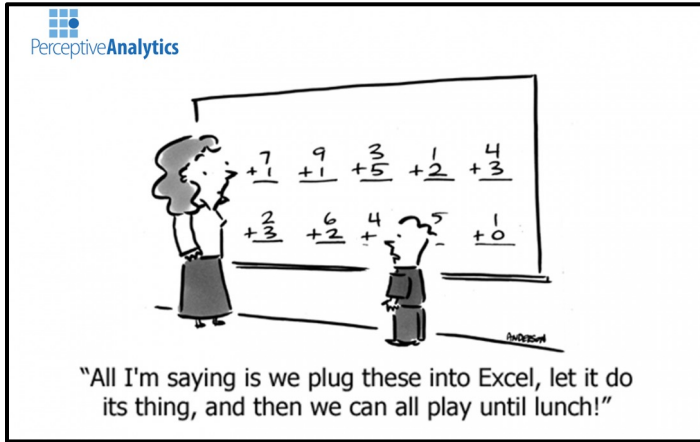
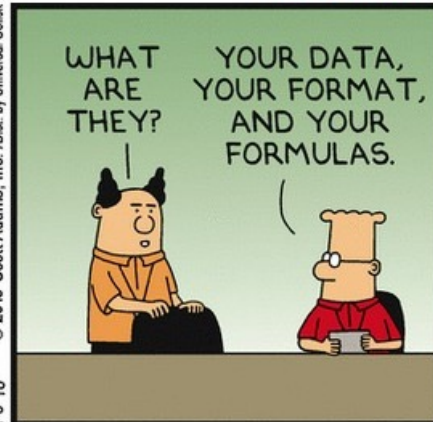
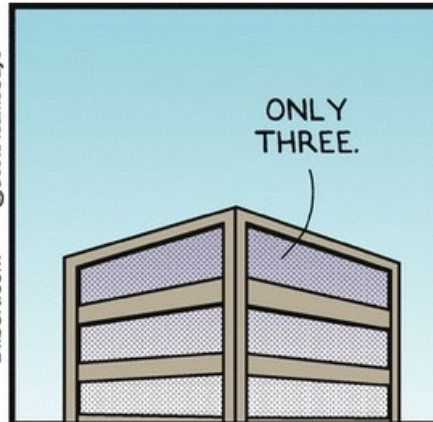
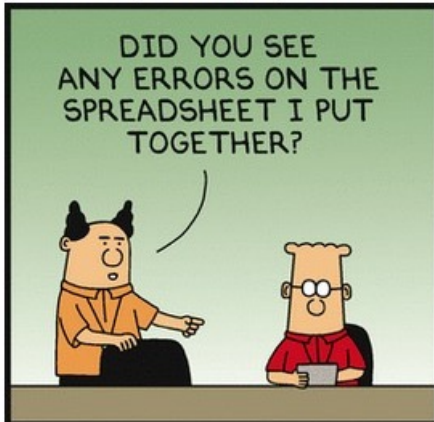


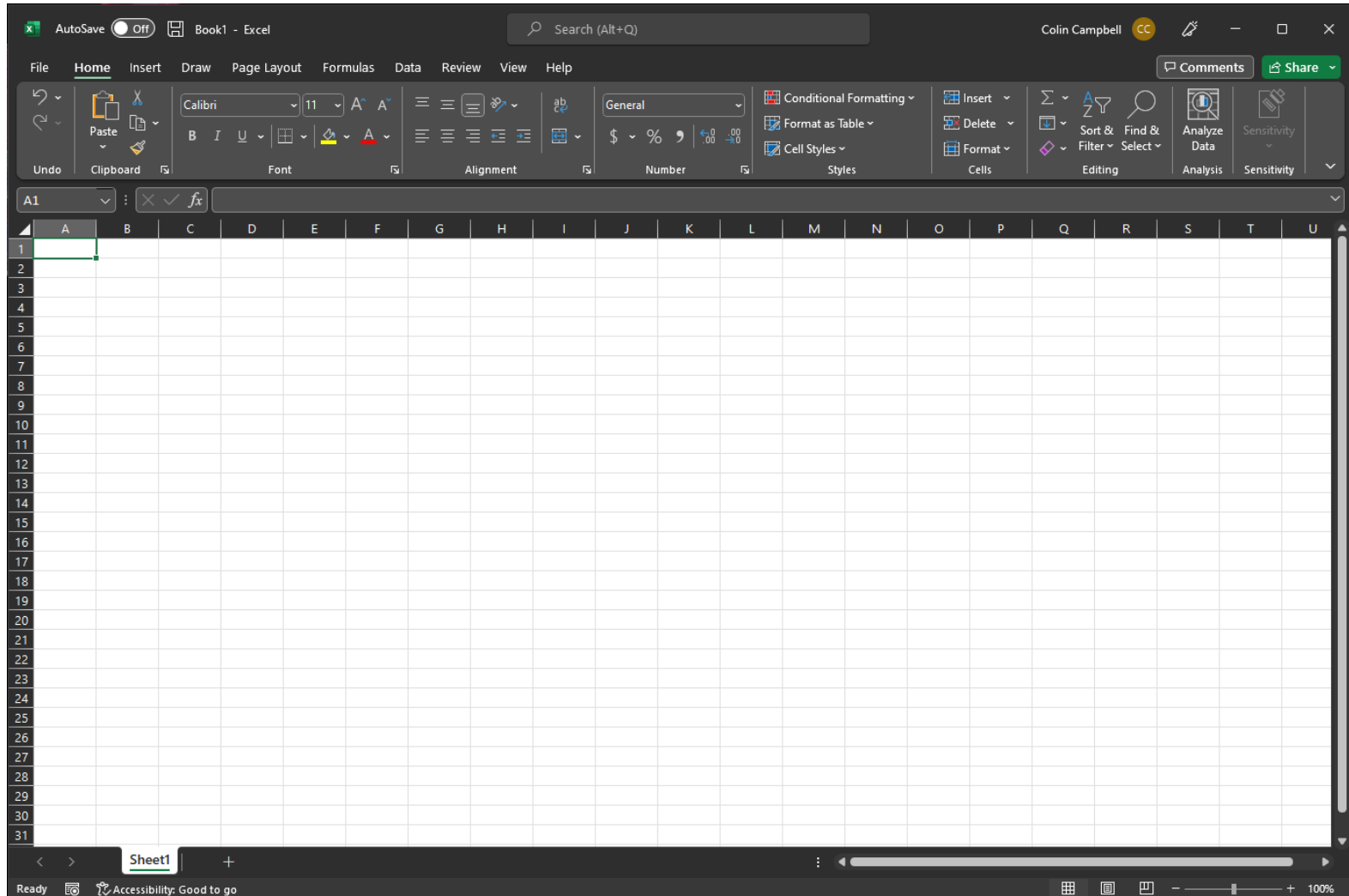
# Excel Basics



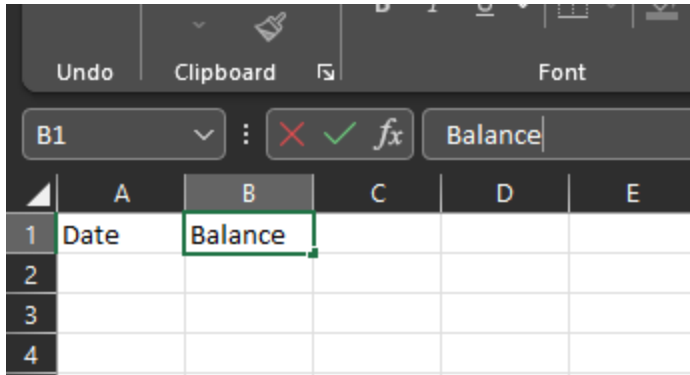
Wednesday January 06, 2016 *Three Problems With Spreadsheet*



# Microsoft Excel is a very powerful tool for visualizing and manipulating data.

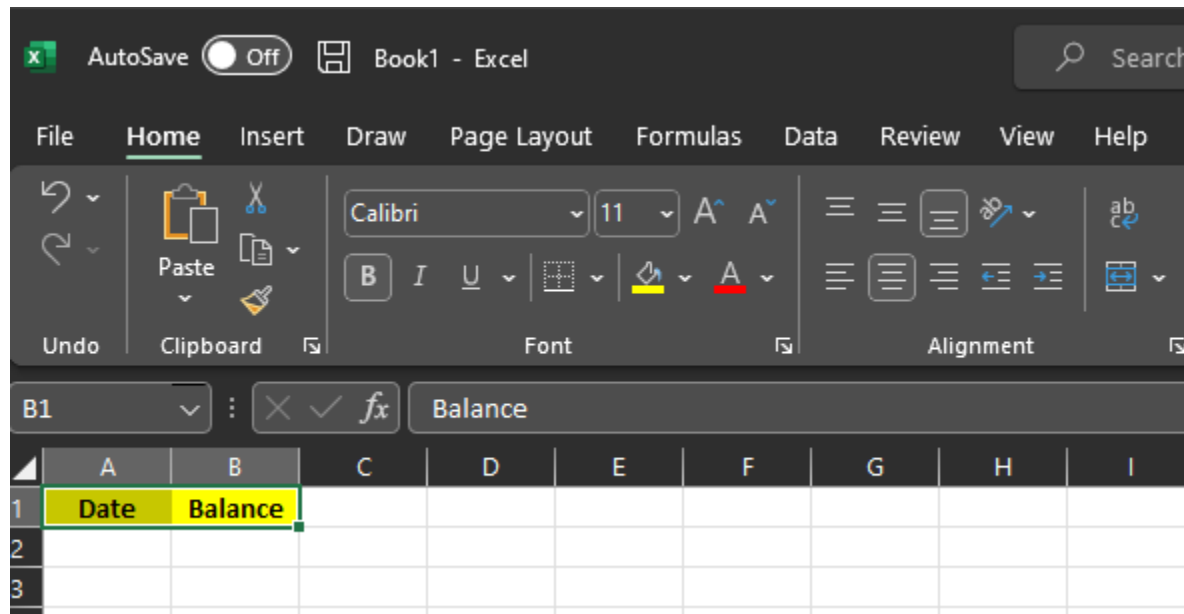


Manually enter data by clicking on a cell and then either typing immediately or clicking on the formula bar first.



Text can be formatted like in Word. Try clicking and dragging across cells A1 and B1, then hitting ctrl-b to make both cells bold.

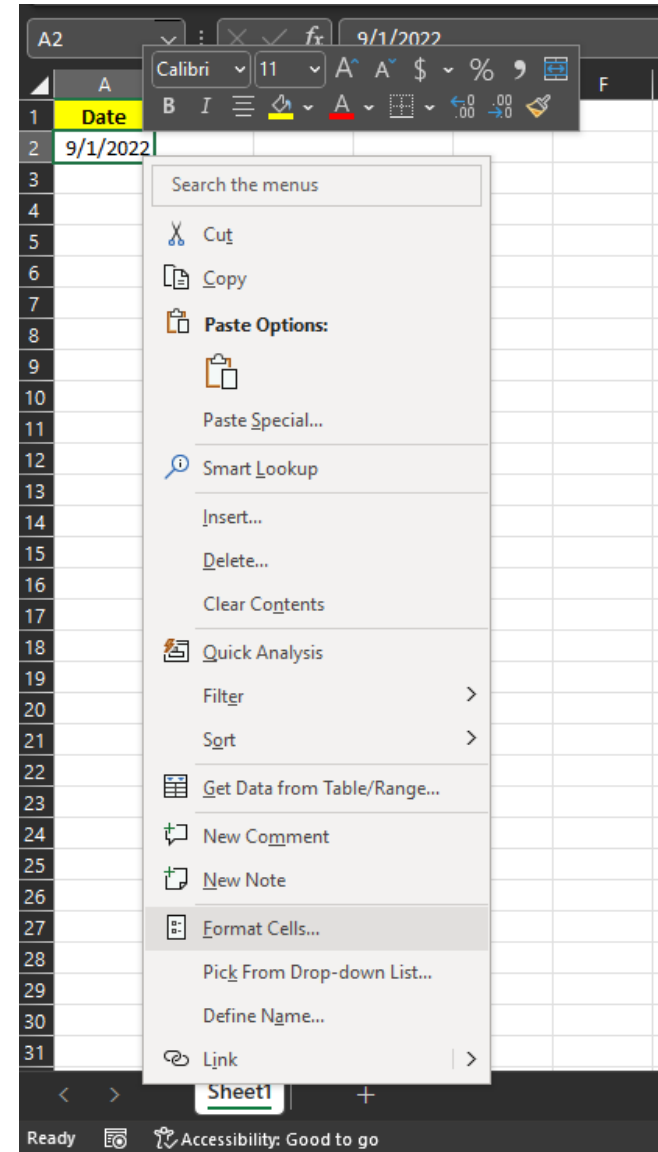
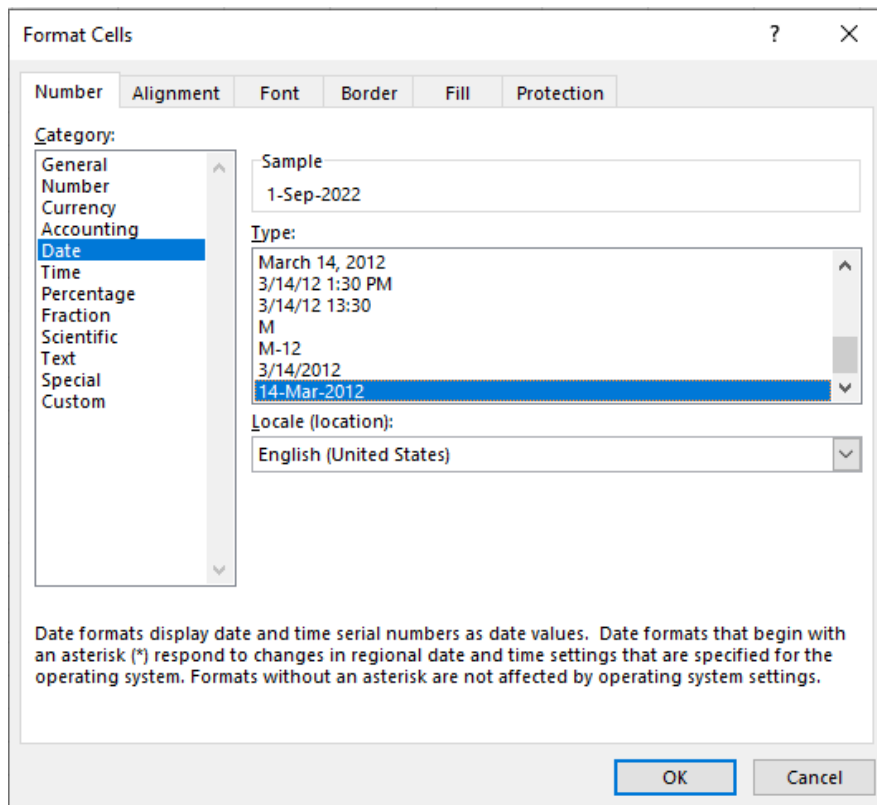
Then, use the toolbar at the top of the window to highlight the cells and center the text.



# Cells can be formatted to display dates, numbers, etc. in a number of ways.

Enter 9/1/22 in cell A2, then right click on the cell and select “Format Cells”:

Select the bottom format in the list, then hit OK:



# Formulas can be entered by starting with the “=” symbol.

- Go to cell A3 and enter **=A2+30**, then hit enter.
- Alternatively, go to cell A3 and enter **=**, then tap the up arrow or click on cell A2, then type **+30** and then hit enter.



	A	B	C
1	Date	Balance	
2	1-Sep-2022		
3	1-Oct-2022		
4			
5			

- Click on cell A3, then click and drag the “little box” on the lower right corner of the cell down until you’ve highlighted cell A14. Then, let go. Finally, double click on the vertical bar between the A and B columns to auto-expand the width of column A.

**Click on cell A14.  
What does the  
formula say?  
(This is an example  
of *autofilling*.)**

	A	B
1	Date	Balance
2	1-Sep-2022	
3	1-Oct-2022	
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		



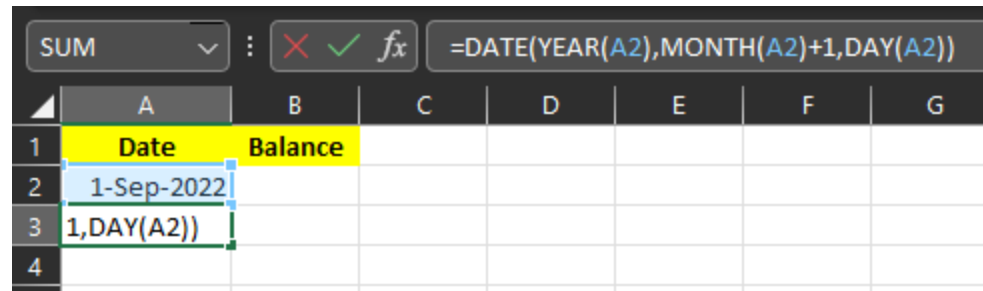
	A	B
1	Date	Balance
2	1-Sep-2022	
3	1-Oct-2022	
4	#####	
5	#####	
6	#####	
7	#####	
8	#####	
9	#####	
10	#####	
11	#####	
12	#####	
13	28-Jul-2023	
14	#####	
15		



	A	B
1	Date	Balance
2	1-Sep-2022	
3	1-Oct-2022	
4	31-Oct-2022	
5	30-Nov-2022	
6	30-Dec-2022	
7	29-Jan-2023	
8	28-Feb-2023	
9	30-Mar-2023	
10	29-Apr-2023	
11	29-May-2023	
12	28-Jun-2023	
13	28-Jul-2023	
14	27-Aug-2023	
15		

If our goal was to get a list of the first of every month, this isn't quite right; there aren't 30 days in every month!

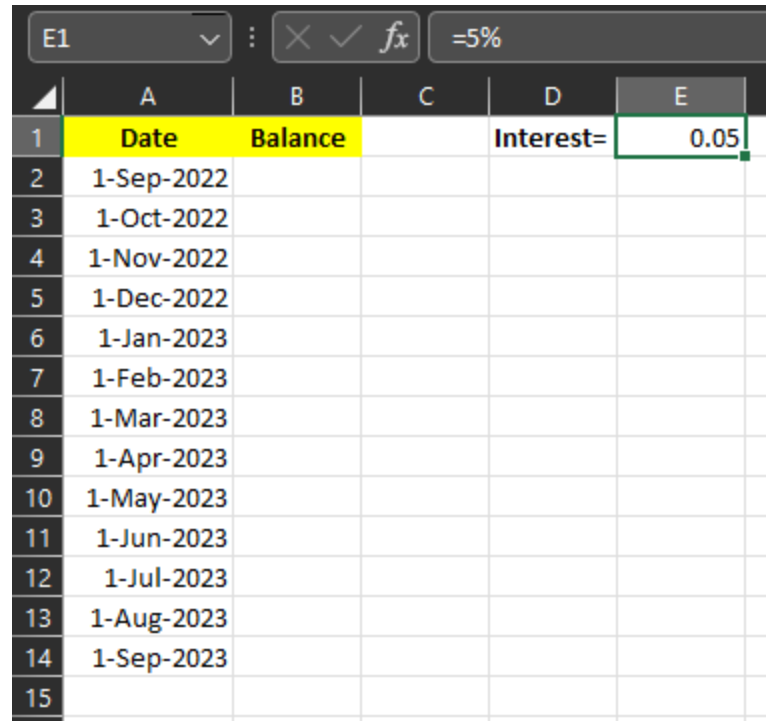
- Highlight cells A3-A14 and hit delete (or backspace).
- Click on cell A3 and then try typing the following formula:



- This is an example of using a **function** in Excel:
  - The **DATE** function takes arguments (year, month, day).
  - We extract the YEAR from Cell A2 with **YEAR(A2)**.
  - We extract the MONTH from Cell A2 but increase by 1 with **MONTH(A2)+1**.
  - We extract the DAY from Cell A2 with **DAY(A2)**.
- Finally, autofill down to A14 by clicking and dragging on A3, like before.

Let's calculate a credit card balance that receives no payments and accumulates interest monthly.

Update your worksheet in cells D1 and E1 (notice the formula bar for E1):



The screenshot shows an Excel spreadsheet with the following data:

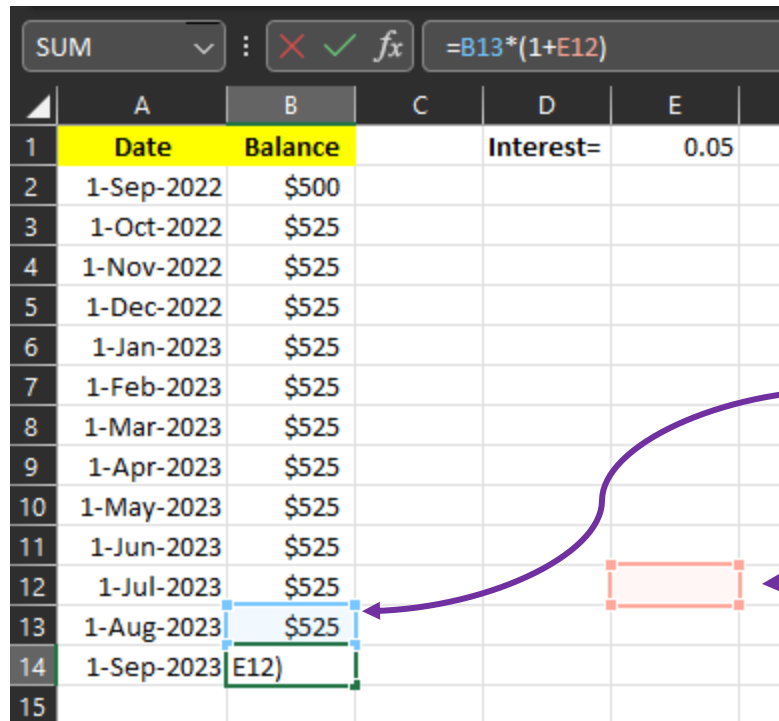
	A	B	C	D	E
1	Date	Balance		Interest=	0.05
2	1-Sep-2022				
3	1-Oct-2022				
4	1-Nov-2022				
5	1-Dec-2022				
6	1-Jan-2023				
7	1-Feb-2023				
8	1-Mar-2023				
9	1-Apr-2023				
10	1-May-2023				
11	1-Jun-2023				
12	1-Jul-2023				
13	1-Aug-2023				
14	1-Sep-2023				
15					

Then, enter a balance of \$500 in cell B2 and see if you can write a formula in cell A3 to determine the balance on October 1 based on the information in cells A2 and E1.

# We can **lock** cell references with the “\$” symbol.

One formula you can use is **=B2\*(1+E1)**.

But if you autofill, the interest isn't computed after the first month!



	A	B	C	D	E
1	Date	Balance		Interest=	0.05
2	1-Sep-2022	\$500			
3	1-Oct-2022	\$525			
4	1-Nov-2022	\$525			
5	1-Dec-2022	\$525			
6	1-Jan-2023	\$525			
7	1-Feb-2023	\$525			
8	1-Mar-2023	\$525			
9	1-Apr-2023	\$525			
10	1-May-2023	\$525			
11	1-Jun-2023	\$525			
12	1-Jul-2023	\$525			
13	1-Aug-2023	\$525			
14	1-Sep-2023	E12)			
15					

By default, Excel looks for the “interest” in a lower row as you autofill!

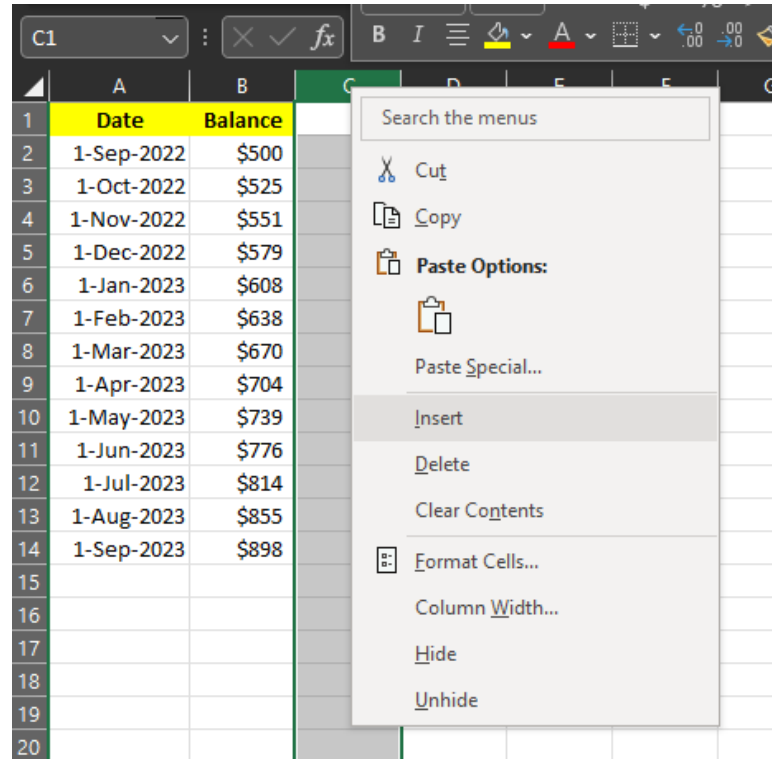
Instead, try **=B2+(1+E\$1)**. What is the correct balance on Sept. 1, 2023?

Type it or use **F4** while your text cursor is inside the cell reference (What do you think \$E1 and \$E\$1 do?)



# What if we make a minimum monthly payment?

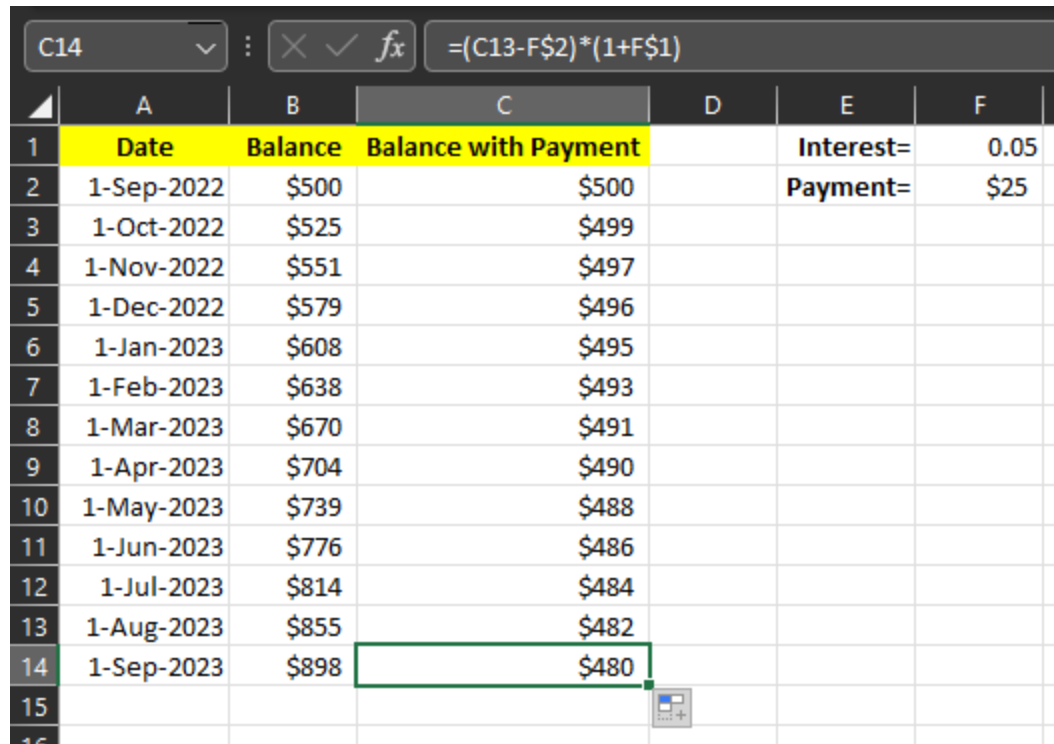
Insert a new column by right clicking on the “C” header and selecting **insert**:



Give a new column header “balance with payment” in C1. Note a monthly payment of \$25 below the interest rate, then populate column C with the new balance each month.

# What if we make a minimum monthly payment?

Your worksheet should look something like this:

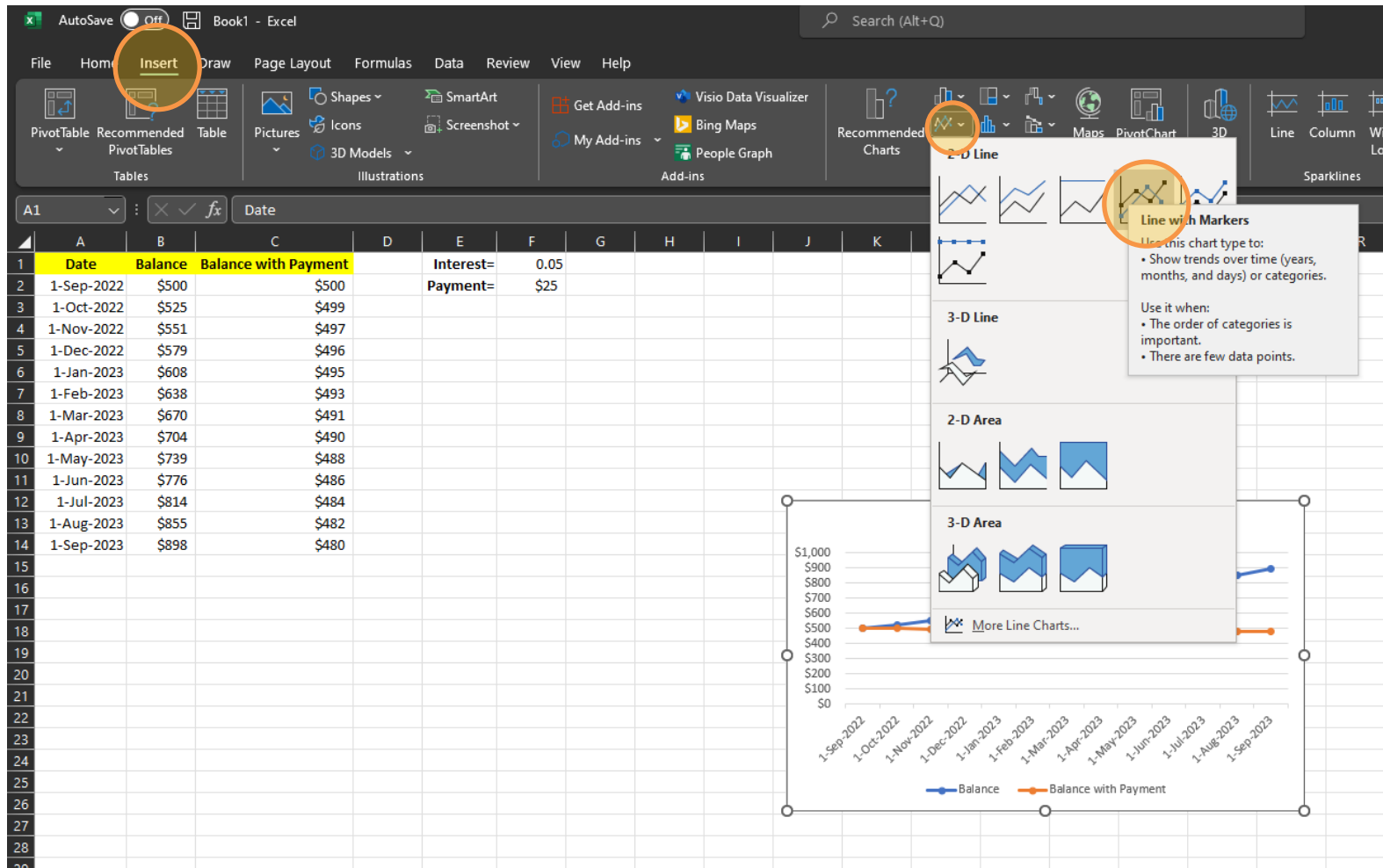


	A	B	C	D	E	F
1	Date	Balance	Balance with Payment		Interest=	0.05
2	1-Sep-2022	\$500	\$500		Payment=	\$25
3	1-Oct-2022	\$525	\$499			
4	1-Nov-2022	\$551	\$497			
5	1-Dec-2022	\$579	\$496			
6	1-Jan-2023	\$608	\$495			
7	1-Feb-2023	\$638	\$493			
8	1-Mar-2023	\$670	\$491			
9	1-Apr-2023	\$704	\$490			
10	1-May-2023	\$739	\$488			
11	1-Jun-2023	\$776	\$486			
12	1-Jul-2023	\$814	\$484			
13	1-Aug-2023	\$855	\$482			
14	1-Sep-2023	\$898	\$480			
15						

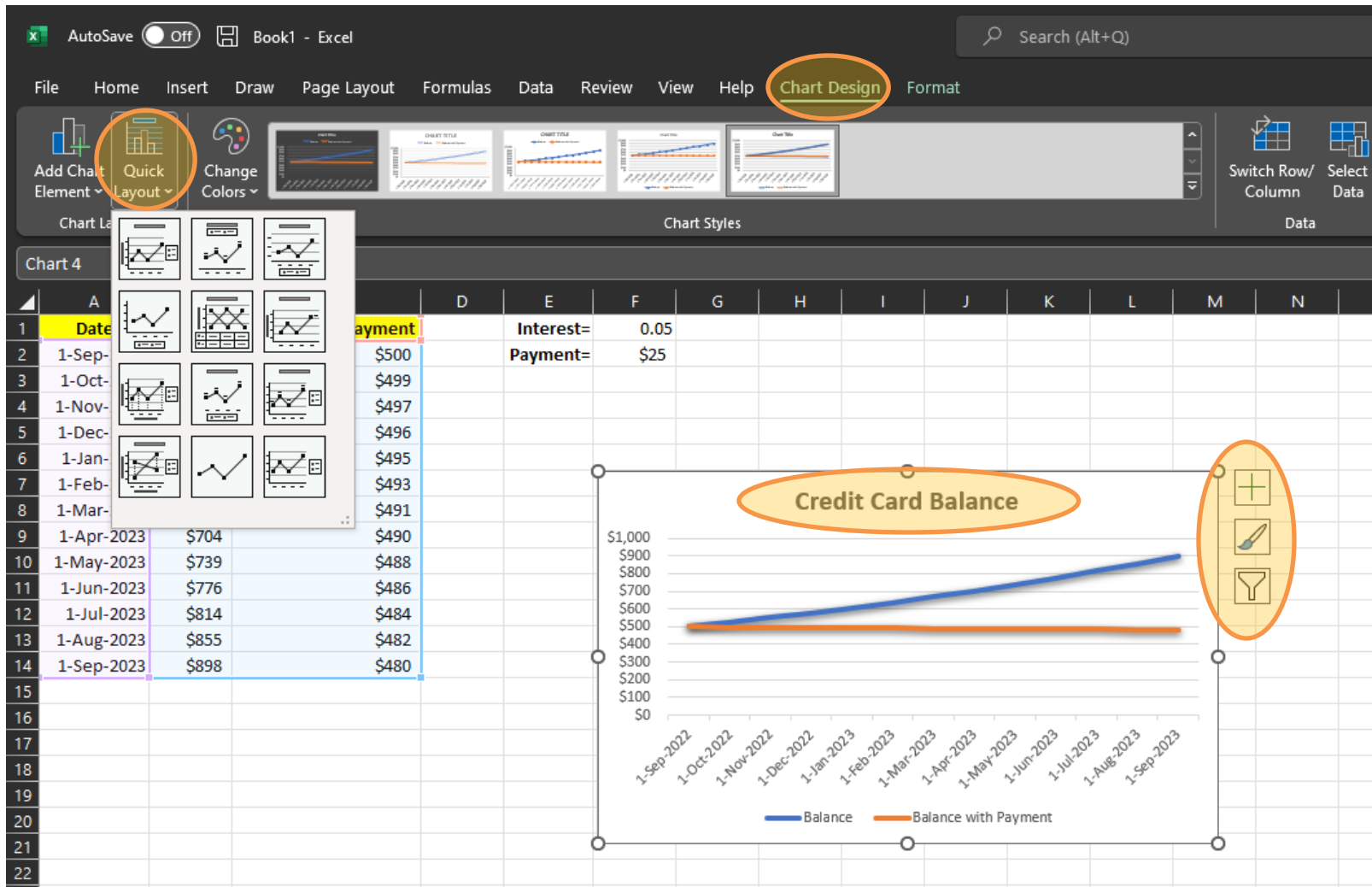
**We see that the payment shrinks, but very slowly!  
Perhaps we should visualize our data...**

# Standard charts can be created from the “insert” ribbon on the toolbar.

First, click on A1, then click and drag to highlight all the data (down to C14). Then insert a “line with markers” chart:

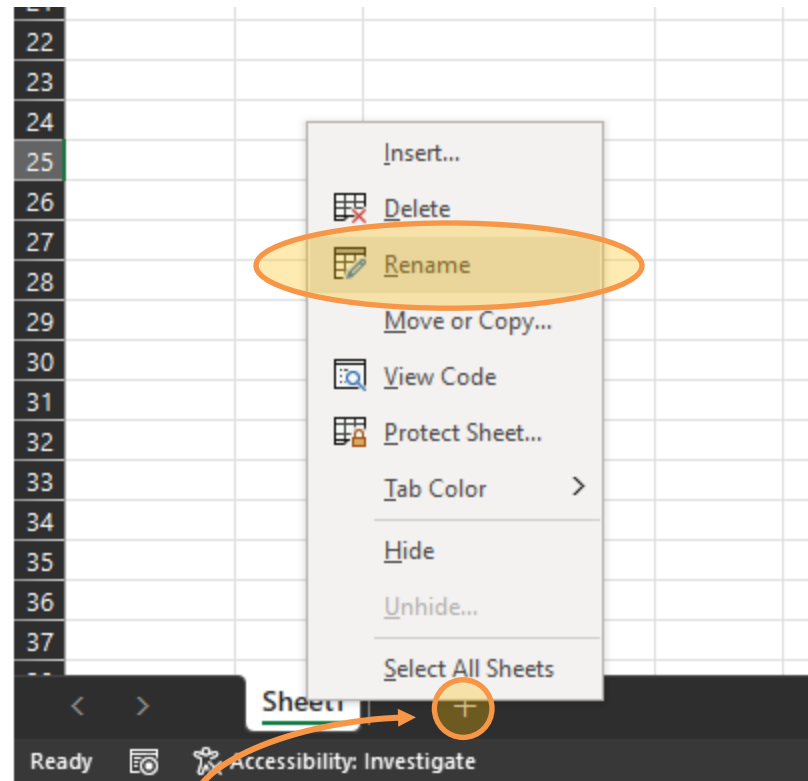


Click on the Title to type it in, then play with the customization buttons on the side (and styles at the top) to see the quick ways you can customize.



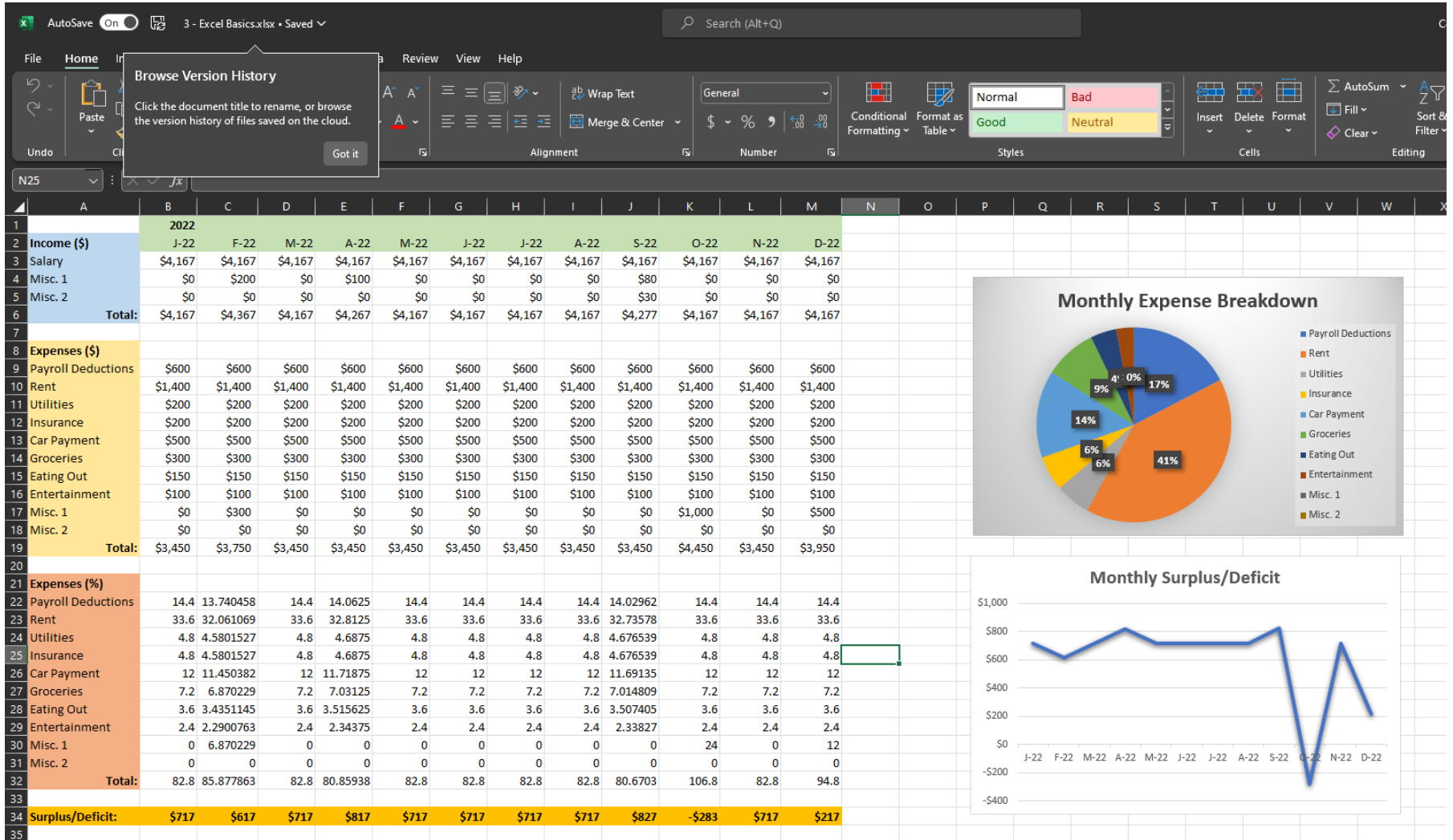
Let's make a **new sheet** to move on to a new example.

Right click on "Sheet 1" on the bottom and rename it "Credit Card".



Then, click the "+" icon to the right of the sheet label to add a second sheet. Name it "Budget." **See the handout for details on the new example!**

# Example Budget Screenshot:



## Recap:

- Excel can be used to visualize data and perform calculations.
- We've seen the basics of entering data, formatting cells, using autocomplete, cell references, functions, and charts.
- Next, we'll think about **importing** data (not just making our own) and performing **statistical tests**.

