Attractive Excel Spreadsheets

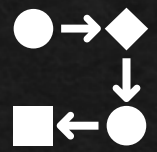
That People Want To Look At

Jack Lynn (2020)

What makes an effective spreadsheet?

- Is the document attractive to look at?
- Does the document appear professional (or match the situation in which it is used)?
- Does the document balance the number of ornaments added?

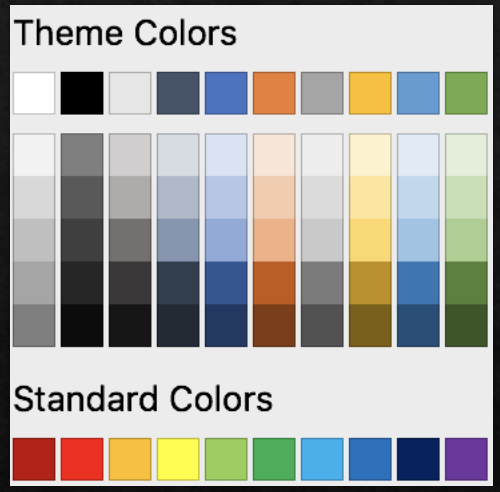
- Is the document easy to read?
- Does the format enhance the audience's ability to retrieve information?
- Is there a natural organization to the document?



- Can the audience follow the train of thought of the author?
- Is there a natural flow to the document?
- Does the addition of graphs and formulas increase the audience's comprehension of the data?

Color

- Make the darkest colors the most important parts, like titles and headers
- Present data in alternating white and light color; reading data is easiest with a light background
- Distinguish different categories of data with different colors
- Most fonts should be black; use white font on dark backgrounds



Theme colors are great for creating color gradients

Use a color wheel to find colors that go well together, such as complimentary colors

Sticking to a strong color palette is a great way to create a professional and visually-pleasing product

Infant Mortality Rate Worldwide

Per 1000 Live Births

Title is the darkest color on the page

Font colors are black or white, depending on which is easier to read

Europe	
Balkans	
Albania	8
Andorra	3
Armenia	11
Azerbaijan	19
Bosnia and Herzegovina	5
Bulgaria	6
Croatia	4
Georgia	9
Macedonia	9
Malta	6
Montenegro	2
Romania	6
Serbia	5
Mean	7.15
Standard Deviation	4.38
Central Europe	
Austria	3
Czechia	3
Germany	3

Oceania	
British Oceania	
Australia	3
New Zealand	5
Mean	4
Standard Deviation	1.41
Melanesia	
Fiji	22
Papua New Guinea	38
Solomon Islands	17
Vanuatu	22
Mean	24.8
Standard Deviation	9.14
Micronesia	
Kiribati	41
Marshall Islands	27
Micronesia	26
Palau	17
Mean	27.8
Standard Deviation	9.91
Polynesia	

Africa	America	Asia	Europe	Oceania
Central Africa	The Carribean	Central Asia	Balkans	British Oceania

Different but complementary colors used to distinguish categories

Consistent color flow: darkest is most general information while lightest is most specific

America	
The Carribean	
Antigua and Barbuda	5
Bahamas	8
Barbados	11
Cuba	4
Dominica	33
Dominican Republic	24
Grenada	14
Haiti	49
Jamaica	12
Saint Kitts and Nevis	10
Saint Lucia	15
Saint Vincent and the Grenadines	15
Trinidad and Tobago	16
Mean	16.6
Standard Deviation	12.4
Central America	
Costa Rica	8
El Salvador	12
Guatemala	22

Asia	
Central Asia	
Kazakhstan	9
Kyrgyzstan	17
Tajikistan	30
Turkmenistan	39
Uzbekistan	19
Mean	22.8
Standard Deviation	11.8
Eastern Asia	
China	7
Japan	2
Mongolia	14
North Korea	14
South Korea	3
Mean	8
Standard Deviation	5.79
South-Eastern Asia	
Brunei Darussalam	10
Cambodia	24
Indonesia	21

Europe	
Balkans	
Albania	8
Andorra	3
Armenia	11
Azerbaijan	19
Bosnia and Herzegovina	5
Bulgaria	6
Croatia	4
Georgia	9
Macedonia	9
Malta	6
Montenegro	2
Romania	6
Serbia	5
Mean	7.15
Standard Deviation	4.38
Central Europe	
Austria	3
Czechia	3
Germany	3

Data alternates between light color and white; data are easiest to read when color is light

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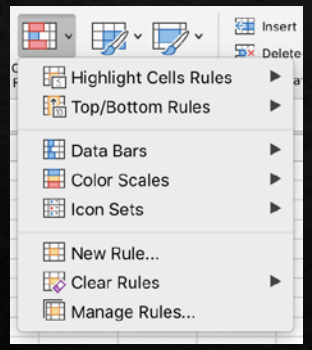
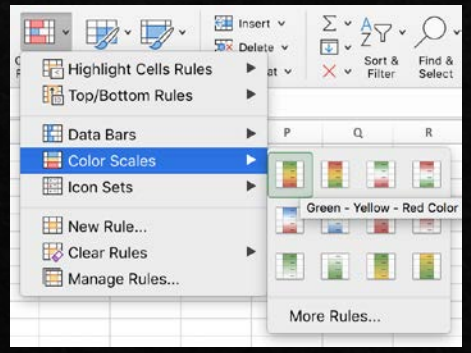
Mean	16.6
Standard Deviation	12.4

TECHNIQUE: Conditional Formatting (i.e. the cell color is based on value)

Album	Band	Metacritic Score
Fetch the Bolt Cutters	Fiona Apple	100
Have You In My Wilderness	Julia Holter	87
It's Not Me, It's You	Lily Allen	71
Loveless	My Bloody Valentine	93
The Caretaker	Half Waif	79
This Is How You Smile	Helado Negro	81
Aporia	Sufjan Stevens	72





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Font

- ***Fonts should never impede the legibility of the spreadsheet***
- Use *sans–serif* fonts for titles and headers
- Use *serif* fonts for data and large bodies of text
- Limit the number of fonts to no more than three

The headers are sans-serif; everything else is serif

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Haiti	49
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Mean	16.6
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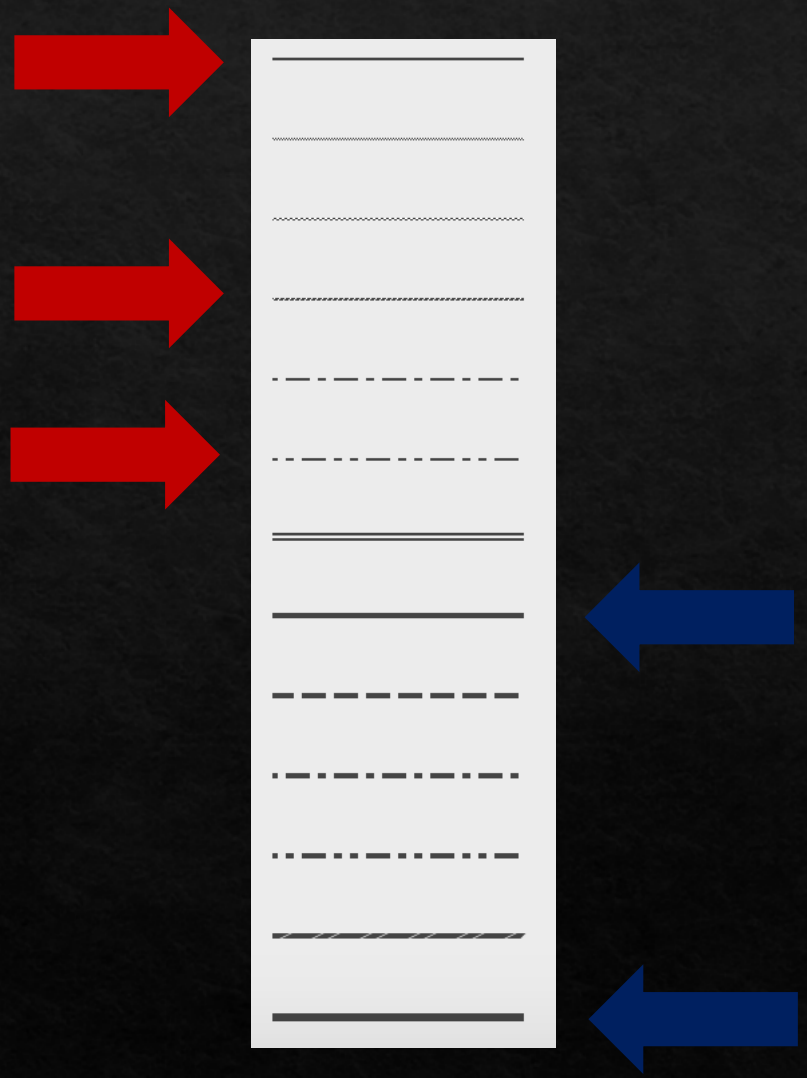
Go-To Fonts	
Sans-Serif	*Serif*
Arial	Calisto MT
Calibri	Sabon
Helvetica	Times New Roman
Geneva	

Borders



- Balance the amount of borders; having too many or too few borders make spreadsheets hard to read
- Use thin or dotted lines to separate headers from data
- Use thick lines to separate large categories of data
- If many data are being presented, do not include a border between each cell

Lack of borders creates a muddled and unprofessional looking spreadsheet

Europe		Oceania	
Western Europe		British Oceania	
Belgium	3	Australia	3
France	3	New Zealand	5
Ireland	3	*Mean*	4
Luxembourg	2	*Standard Deviation*	1.41
Netherlands	3		
United Kingdom	4		
Mean	3		
Standard Deviation	0.63		

Europe		Oceania	
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Mean	3		
Standard Deviation	0.63		

The perfect amount of borders will create clear separation between components while not making data difficult to read

Too many border inserts too much black to see the contents

Europe		Oceania	
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TECHNIQUE: Draw Borders

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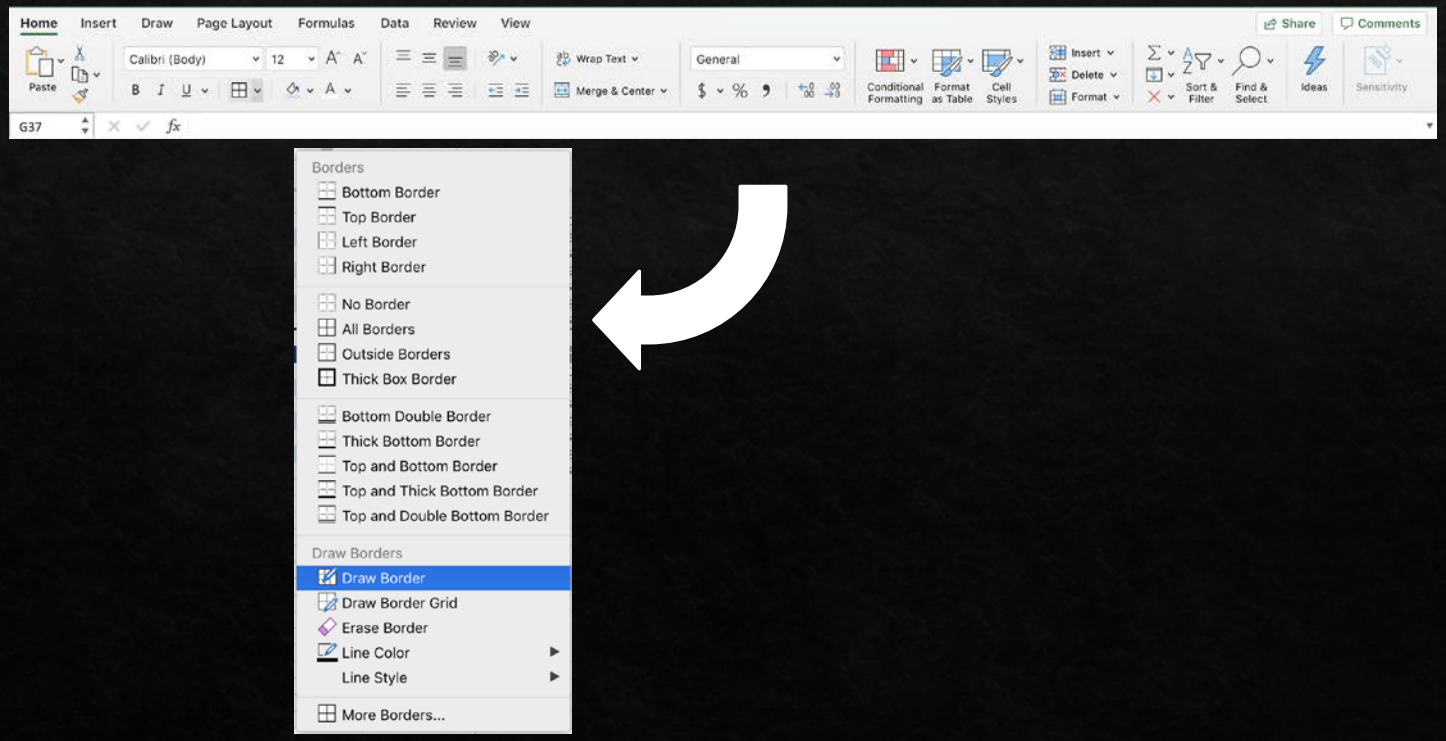

While no spreadsheet should have borders like this, the Draw Borders tool makes adding different types of borders much faster

Alignment

The following is the convention for aligning text:

Left Aligned	Center Aligned	Right Aligned
Titles *(rarely)*	Titles *(most often)*	
		Numbers
Text		
Labels		
	Headers	
Sentences		

Spacing

Generally, keep the spacing as tight as possible; however, a one-block space can be useful for separating categories of data.

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Ireland	3	*Mean*	4
Luxembourg	2	*Standard Deviation*	1.41
Netherlands	3		
United Kingdom	4		
Mean	3		
Standard Deviation	0.63		

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Ireland	3	*Mean*	4
Luxembourg	2	*Standard Deviation*	1.41
Netherlands	3		
United Kingdom	4		
Mean	3		
Standard Deviation	0.63		

USING EXCEL EQUATIONS

Basic Functions in Excel (1 of 2)

Function	Function Code
Addition	+
Subtraction	-
Multiplication	*
Division	/
Exponent	POWER(#, n)
Exponential	EXP(#)
Natural Log	LN(#)
Blocking	(#)
Concatenation	&
Sum	SUM(#)
Multiple numbers in a row	N_k:N_n

https://support.office.com/en-us/article/excel-functions-alphabetical-b3944572-255d-4efb-bb96-c6d90033e188

Basic Functions in Excel (2 of 2)

Function	Function Code
Absolute Value	ABS(#)
Cosine, Arccosine, Hyperbolic Cosine	COS(#), ACOS(#), COSH(#)
Sine, Arcsine, Hyperbolic Sine	SIN(#), ASIN(#), ASINH(#)
Convert Degrees to Radians	RADIANS(#)
Convert Radians to Degrees	DEGREES(#)
Random Number Between 0 and 1	RAND()
Square Root	SQRT(#)
Pi	PI()
Multiplying Matrices	MMULT(matrix_1, matrix_2)
Transpose Matrix	TRANSPOSE(matrix)
Inverse Matrix	MINVERSE(matrix)
Determinant	MDETERM(matrix

https://support.office.com/en-us/article/excel-functions-alphabetical-b3944572-255d-4efb-bb96-c6d90033e188

General Tools for Inputting Functions

- Generally, basic arithmetic functions can be entered in sequence in a single cell
- Looping systems of equations (i.e. systems without free variables) can only be solved using matrices
- Non-looping systems of equations (i.e. equations with at least one free variable) can be solved using strings of equations or matrices given that you know the value of the free variable
- When using specific built-in functions, such as trig functions, put the function in its own unique box and reference to this box when calculating; failure to do so will result in an error

Using Matrices in Excel

9	13	5	2
1	11	7	6
4	7	4	1
6	0	7	10

=MINVERSE(A) → A^{-1}

0.1	-0.1	-0	0.05
0.11	0.08	-0.2	-0.1
-0.3	-0.1	0.72	0.03
0.17	0.11	-0.5	0.05

=MDETERM(A) → |A|

1654

A^T → =TRANSPOSE(A)

9	1	4	6
13	11	7	0
5	7	4	7
2	6	1	10

https://bettersolutions.com/excel/functions/matrix-category.htm

Solving Looping Systems of Equations Using Excel Matrices

$Ax=b$ → $x=A^{-1}b$

=MINVERSE(A)

9	13	5	2	a	=	120
1	11	7	6	b		129
4	7	4	1	c		139
6	0	7	10	d		288

0.1	-0.1	-0	0	120	=	a
0.11	0.08	-0.2	-0.1	129		b
-0.3	-0.1	0.72	0	139		c
0.17	0.11	-0.5	0	288		d

=MMULT(A^{-1},b)
(Solution)

8.86	=	a
-18		b
61.5		c
-20		d

https://bettersolutions.com/excel/functions/matrix-category.htm

Basic Statistics

Statistic	Function Code
Mean	=AVERAGE(#)
Mean, excluding some numbers	=AVERAGEIF(#,"qualifying factors [<, >, =]")
Median	=MEDIAN(#)
Mode	=MODE(#)
Standard Deviation	=STEDV(#)
Standard Error	=MIN(#)/SQRT(n)
Minimum	=MIN(#)
Maximum	=MAX(#)

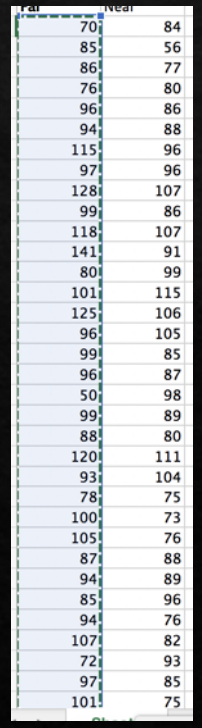
TECHNIQUE: Student's (t) Test (i.e. statistical test in which the sample size is small)

0.17934602

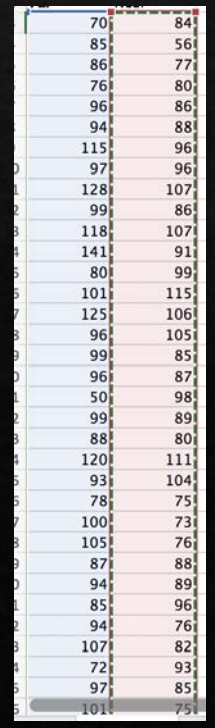
=TTEST(A3:A69,B3:B59, 2, 2)

=TTEST(array_1, array_2, number_of_tails, type_of_test)

First Group's Data



Second Group's Data



Type of test codes:

1 = paired t test

2 = equal variance test

3 = inequal variance test

https://www.youtube.com/watch?v=q0ckcKsSPXU

TECHNIQUE: Normal Curve z Test (i.e. statistical test for population mean and SD) for Sample Mean

The p-value presented will always be lower tail, one-side

1

=ZTEST(A1:A16,D14)

356.965
28.58811
19.81643
34.21143
158.6953
55.03242
33.49641
34.50879
21.91755
23.3345
44.26713
35.59477
43.25145
29.64717
21.26819
33.06629
87.00657
47.97827
34.41316
47.49281
19.69734
29.86496
32.91922
25.94295
24.17471
29.65505
43.34176
30.72872
25.93796
33.24197
34.4743
38.54633
28.86647
58.71957
32.4933

Sample Data

=ZTEST(array_1, sample_mean)

=AVERAGE(B1:B40

=AVERAGE(array_2)

29.14904
28.23566
27.36387
35.68304
31.1166
20.76762
56.61175
21.79414
27.53514
22.49865
24.88333
20.088
22.55238
19.00892
28.13054
26.30373

Population Data

Note: The p-value presented CANNOT be used for anything other than sample means

https://www.dummies.com/software/microsoft-office/excel/how-to-perform-z-test-calculations-in-excel/

Ultimately, a great spreadsheet is easy to read, informative, and accurate; anything that helps achieve this goal is a worthwhile addition.

References

- https://archsmarter.com/9-steps-beautiful-spreadsheets/
- https://www.techrepublic.com/blog/windows-and-office/20-excel-tips-for-creating-stylish-spreadsheets/
- https://www.youtube.com/watch?v=IHvMKv9mcTs
- https://support.microsoft.com/en-gb/office/math-and-trigonometry-functions-reference-ee158fd6-33be-42c9-9ae5-d635c3ae8c16