

# Expertizing some Excel formulas

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# Start with MAX formula

# =“Total sum of graduates” & “ ” & MAX(Sheet1!\$A:\$A)

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A11 : [X] [✓] [fx] ="Total Sum of Graduates in the Field:" & " " & MAX(Sheet1!\$A:\$A)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
3	No.:					TRANSCRIPT OF RECORDS													
4	Date:																		
5																			
6	Full Name:																		
7	Gender / Nationality: Female /					Date of Birth:													نسخ
8	College: AlKindy College of Medicine					Degree: M.B.CH.B													١
9	Evaluation:					Type of Study: Full-time													
10	Year of Admission: 2016 - 2017					Year of Graduation: 2021 - 2022													
11	Total Sum of Graduates in the Field: 115					Graduate's Rank: 1													
12	Graduate's Average: 00.0000%					Attempt:													
13	First Graduate's Average: 0.0000%					Date of Graduation: 00/01/1900													

1

2

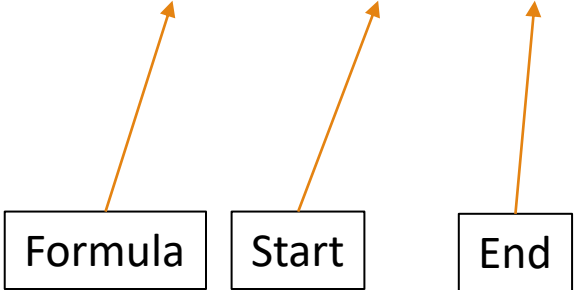
34

5



# SUM formula

# =SUM(R6:R7)



Formula bar: `=SUM(R6:R7)`

people who are prone to sudden anger more likely to develop heart disease?  
observational study followed a random sample of 8474 people with normal  
pressure for about four years.

		anger level			
		Low	Moderate	High	total
chd	Observed				
	Yes	53	110	27	190
No	3057	4621	606	8284	
total	3110	4731	633	8474	

$$\chi^2 = \sum \frac{(\text{Observed count} - \text{Expected count})^2}{\text{Expected count}}$$

row total · column total



# Equation

$$=((Q6-Q11)^2/Q11)$$

Squared sign

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Q16 :  $\times$   $\checkmark$   $f_x$   $=((Q6-Q11)^2)/Q11$

1 Are people who are prone to sudden anger more likely to develop heart disease?

2 An observational study followed a random sample of 8474 people with normal

3 blood pressure for about four years.

$$\chi^2 = \sum \frac{(Observed\ count - Expected\ count)^2}{Expected\ count}$$

$$expected\ count = \frac{row\ total \cdot column\ total}{table\ total}$$

df 2

Critical values of the Chi-square distribution with d degrees of freedom

Probability of exceeding the critical value

d	0.05	0.01	0.001	d	0.05	0.01	0.001
2	3.841	5.991	9.210	3	7.879	9.488	12.838

	Observed	Low	anger level	total
			Moderate	High
chd	Yes	53	110	27
	No	3057	4621	606
	total	3110	4731	633
	Expected			
	yes	69.73	106.08	14.19
	no	3040.27	4624.92	618.81
		3110.00	4731.00	633.00
	X2			
	yes	4.01435006	0.14514039	11.556806
	no	0.09207225	0.00332891	0.2650644
	sum	16.0767621		
	P<0.001			
		0.000322831		

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER ADD-INS

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Calibri 11 A A Wrap Text Merge & Center General Conditional Formatting Table Cell Styles Insert Delete Format AutoSum Fill Clear Sort & Find & Filter Select

To calculate Chi-square statistical test in Excel

N21 :  $\text{=CHISQ.TEST}(O6:Q7;O11:Q12)$

1 Are people who are prone to sudden anger more likely to develop heart disease?  
 2 An observational study followed a random sample of 8474 people with normal  
 3 blood pressure for about four years.

$$\chi^2 = \sum \frac{(\text{Observed count} - \text{Expected count})^2}{\text{Expected count}}$$

$$\text{expected count} = \frac{\text{row total} \cdot \text{column total}}{\text{table total}}$$

df 2




Critical values of the Chi-square distribution with *d* degrees of freedom

Probability of exceeding the critical value

<i>d</i>	0.05	0.01	0.001	<i>d</i>	0.05	0.01	0.001
1	3.841	6.635	10.828	2	5.991	9.210	13.816
3	7.879	11.345	16.267	4	9.488	13.277	17.535
5	11.070	15.086	20.515	6	12.592	16.812	22.455
7	14.449	18.475	24.723	8	15.507	20.090	26.191
9	17.535	21.920	28.577	10	18.475	23.589	31.526
11	20.515	25.516	32.909	12	21.920	27.219	36.215
13	23.589	29.288	37.156	14	25.516	30.578	40.756
15	26.191	32.909	41.401	16	29.288	34.000	44.771
17	28.577	36.191	44.771	18	32.909	37.156	48.758
19	30.578	39.337	47.963	20	36.191	40.289	52.779
21	32.909	42.457	50.002	22	39.337	43.401	56.193
23	34.915	45.569	52.002	24	42.457	46.427	59.341
25	36.781	48.602	54.000	26	45.569	49.451	62.658
27	38.566	51.559	56.000	28	48.602	52.438	66.125
29	40.289	54.456	58.000	30	51.559	55.338	69.658
31	41.902	57.339	60.000	32	54.456	58.202	73.254
33	43.401	60.191	62.000	34	57.339	61.058	76.909
35	44.771	63.013	64.000	36	60.191	63.891	80.625
37	46.059	65.779	66.000	38	63.013	66.782	84.401
39	47.264	68.562	68.000	40	65.779	69.648	88.232
41	48.391	71.329	70.000	42	68.562	72.479	92.121
43	49.433	74.076	72.000	44	71.329	75.275	96.071
45	50.492	76.753	74.000	46	74.076	78.034	100.084
47	51.559	79.430	76.000	48	76.753	80.756	104.162
49	52.639	82.127	78.000	50	79.430	83.434	108.297
51	53.672	84.842	80.000	52	82.127	86.070	112.491
53	54.678	87.564	82.000	54	84.842	88.684	116.746
55	55.658	90.293	84.000	56	87.564	91.267	121.064
57	56.613	93.029	86.000	58	90.293	93.819	125.438
59	57.563	95.773	88.000	60	93.029	96.340	129.869
61	58.528	98.535	90.000	62	95.773	98.830	134.358
63	59.508	101.315	92.000	64	98.535	101.290	138.906
65	60.493	104.113	94.000	66	101.315	103.720	143.514
67	61.483	106.929	96.000	68	104.113	106.120	148.183
69	62.478	109.763	98.000	70	106.929	108.490	152.914
71	63.468	112.615	100.000	72	109.763	110.830	157.708
73	64.463	115.485	102.000	74	112.615	113.140	162.566
75	65.463	118.373	104.000	76	115.485	115.420	167.489
77	66.468	121.279	106.000	78	118.373	117.670	172.477
79	67.478	124.203	108.000	80	121.279	119.890	177.531
81	68.493	127.145	110.000	82	124.203	122.080	182.651
83	69.513	130.105	112.000	84	127.145	124.240	187.837
85	70.538	133.083	114.000	86	130.105	126.370	193.090
87	71.568	136.079	116.000	88	133.083	128.470	198.411
89	72.603	139.093	118.000	90	136.079	130.540	203.801
91	73.643	142.125	120.000	92	139.093	132.580	209.261
93	74.688	145.175	122.000	94	142.145	134.590	214.791
95	75.738	148.243	124.000	96	145.193	136.570	220.391
97	76.793	151.329	126.000	98	148.245	138.520	226.061
99	77.853	154.433	128.000	100	151.313	140.440	231.791

	Observed	Low	Moderate	High	total
chd	Yes	53	110	27	190
	No	3057	4621	606	8284
	total	3110	4731	633	8474
	Expected				
	yes	69.73	106.08	14.19	190.00
	no	3040.27	4624.92	618.81	8284.00
		3110.00	4731.00	633.00	8474.00
	X2				
	yes	4.01435006	0.14514039	11.556806	
	no	0.09207225	0.00332891	0.2650644	
	sum	16.0767621			
	P<0.001				
		0.000322831			

# Average formula

C16 :    =AVERAGE(C3:C15)

	A	B	C	D	E
2			G1	G2	
3			12	84	
4			58	65	
5			25	29	
6			23	15	
7			25	47	
8			45	32	
9			20	15	
10			21	84	
11			56	35	
12			87	65	
13			21	47	
14			65	54	
15			98	88	
16		mean	42.76923	50.76923	
17		N	13	13	

# To calculate number of data

Excel spreadsheet showing a data table and a summary table. The data table has columns C and D, and rows 2-15. The summary table has columns B, C, and D, and rows 16-19. A formula bar at the top shows '=COUNT(C3:C15)'. A black box highlights the data in columns C and D from rows 3 to 15. A green box highlights the 'N' cell in the summary table. Arrows point from the formula bar to the data range and from the 'N' cell to the data range.

	A	B	C	D	E
2			G1	G2	
3			12	84	
4			58	65	
5			25	29	
6			23	15	
7			25	47	
8			45	32	
9			20	15	
10			21	84	
11			56	35	
12			87	65	
13			21	47	
14			65	54	
15			98	88	
16		mean	42.76923	50.76923	
17		N	13	13	
18		N-1	12	12	
19		Std	27.91103	25.28555	



# To calculate Standard Deviation of the data

A standard deviation (or  $\sigma$ ) is a measure of how dispersed the data is in relation to the mean. Low, or small, standard deviation indicates data are clustered tightly around the mean, and high, or large, standard deviation indicates data are more spread out.

The image shows an Excel spreadsheet with data for two groups, G1 and G2. The formula bar at the top shows the formula `=STDEV(C3:C15)` being entered into cell C19. The data is organized as follows:

	A	B	C	D	E
2			G1	G2	
3			12	84	
4			58	65	
5			25	29	
6			23	15	
7			25	47	
8			45	32	
9			20	15	
10			21	84	
11			56	35	
12			87	65	
13			21	47	
14			65	54	
15			98	88	
16		mean	42.76923	50.76923	
17		N	13	13	
18		N-1	12	12	
19		Std	27.91103	25.28555	
20					

# To calculate Variance

$$\text{variance} = \frac{\text{Sum}(x_i - x')^2}{N-1}$$

The term variance refers to a statistical measurement of the spread between numbers in a data set

	A	B	C	D	E	F	G	H
2			G1	G2			xi-x' (G1)	(xi-x')^2
3			12	84			-30.76923077	946.7456
4			58	65			15.23076923	231.9763
5			25	29			-17.76923077	315.7456
6			23	15			-19.76923077	390.8225
7			25	47			-17.76923077	315.7456
8			45	32			2.230769231	4.976331
9			20	15			-22.76923077	518.4379
10			21	84			-21.76923077	473.8994
11			56	35			13.23076923	175.0533
12			87	65			44.23076923	1956.361
13			21	47			-21.76923077	473.8994
14			65	54			22.23076923	494.2071
15			98	88			55.23076923	3050.438
16		mean	42.76923	50.76923			Sum	9348.308
17		N	13	13			Variance	779.0256
18		N-1	12	12			Var. from formula	779.0256
19		Std	27.91103	25.28555				

Calculate variance using equation?

# To calculate Correlation

$$\text{Correlation} = \text{Covariance} / (\text{std}(G1) * \text{std}(G2))$$

In statistics, correlation or dependence is any statistical relationship, whether causal or not, between two random variables

		G1		G2		xi-x' (G1)		(xi-x')^2	
2									
3			12	84			-30.76923077	946.7456	
4			58	65			15.23076923	231.9763	
5			25	29			-17.76923077	315.7456	
6			23	15			-19.76923077	390.8225	
7			25	47			-17.76923077	315.7456	
8			45	32			2.230769231	4.976331	
9			20	15			-22.76923077	518.4379	
10			21	84			-21.76923077	473.8994	
11			56	35			13.23076923	175.0533	
12			87	65			44.23076923	1956.361	
13			21	47			-21.76923077	473.8994	
14			65	54			22.23076923	494.2071	
15			98	88			55.23076923	3050.438	
16		mean	42.76923	50.76923			Sum	9348.308	
17		N	13	13			Variance	779.0256	M
18		N-1	12	12			Var. from formula	779.0256	
19		Std	27.91103	25.28555					
20									
							Correlation	0.330835	m
							Correlation	0.358404	fc

Calculate correlation using equations?

$$\text{Covariance formula in excel} = \text{covar}(C3:c15);(d3:d15))$$