Professional skills and group study

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Excel/Word

Note:

Please use the app installed in the desktop/laptop because several features of excel/word do not work with the web version.

Use Professional skills excel tutorial (pdf) to help using excel.

EXCEL PRACTICE

- Use function on Excel
- Import data for text files
- Sort tables
- Create charts
- Fitting of a curve

Task 1

A	B	C	D	E	F
Number			Results		
1			Sum	21	
2			Average	3.5	
3			Count	6	
4			MAX	6	
5			MIN	1	
6					

Please reproduce the Excel spreadsheet above

To refresh how to use the Math functions:

Sum, Average, Count, Max and Min

- The functions can be found in the Formulas ribbon/insert function.

Task 2

Please reproduce the Excel table on the side

To refresh how to use the Math functions:

Radians /Degree function to convert degrees angles in Radians.

- The functions can be found in the Formulas ribbon/insert function.

Degrees	Radians
45.0000	0.7854
90.0000	1.5708
135.0000	2.3562
180.0000	3.1416
225.0000	3.9270
270.0000	4.7124
315.0000	5.4978
360.0000	6.2832

Task 3

Please reproduce the Excel table on the side

To refresh how to use the Math functions:

Radians /Degree and the functions sin/cosine and arcsine and arccosine.

The functions can be found in the Formulas ribbon/insert function.

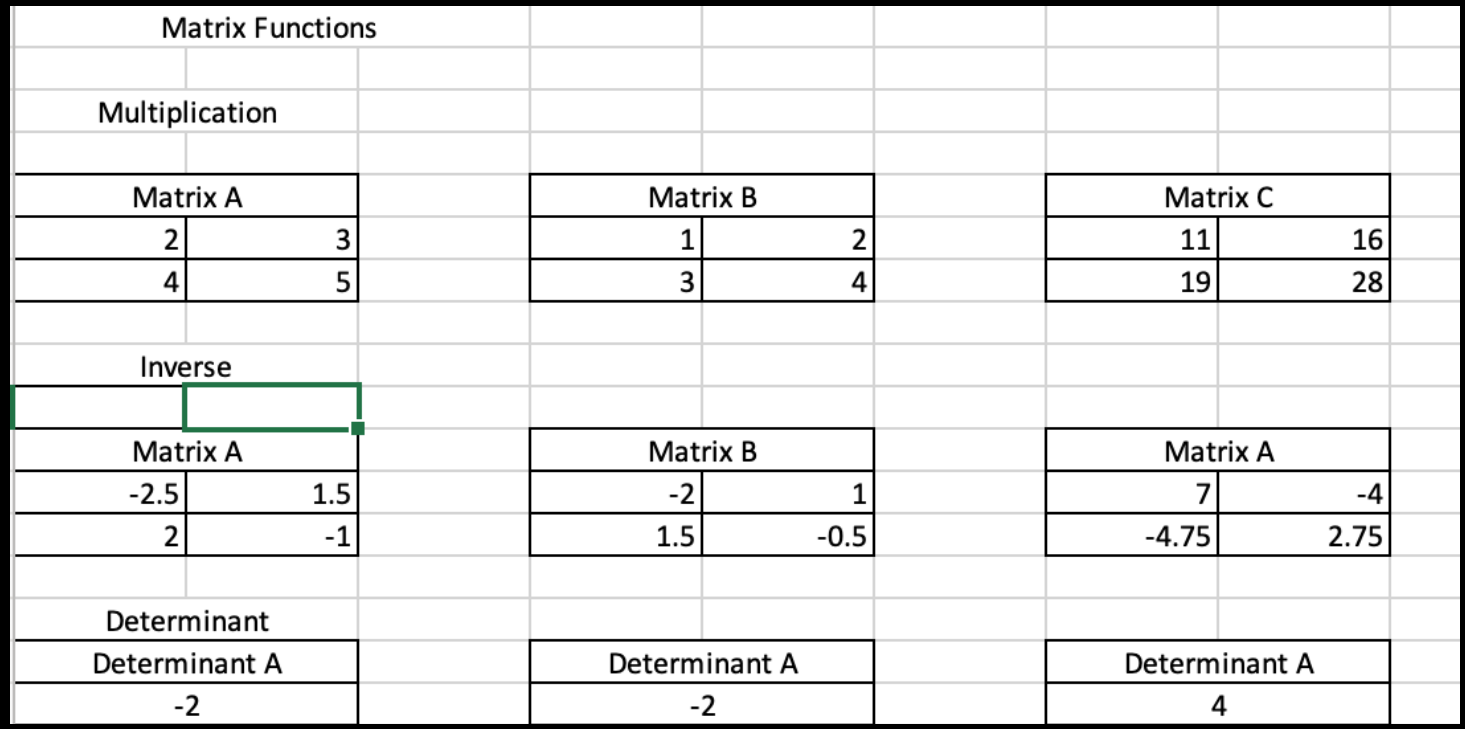
Trigonometry Functions					
	SIN	ASIN	COS	ACOS	ACOS (Degree)
10.0000	0.1736	0.1745	0.9848	0.1745	10.0000
30.0000	0.5000	0.5236	0.8660	0.5236	30.0000
45.0000	0.7071	0.7854	0.7071	0.7854	45.0000
60.0000	0.8660	1.0472	0.5000	1.0472	60.0000
75.0000	0.9659	1.3090	0.2588	1.3090	75.0000
90.0000	1.0000	1.5708	0.0000	1.5708	90.0000
120.0000	0.8660	1.0472	-0.5000	2.0944	120.0000
135.0000	0.7071	0.7854	-0.7071	2.3562	135.0000
150.0000	0.5000	0.5236	-0.8660	2.6180	150.0000
165.0000	0.2588	0.2618	-0.9659	2.8798	165.0000
180.0000	0.0000	0.0000	-1.0000	3.1416	180.0000
210.0000	-0.5000	-0.5236	-0.8660	2.6180	150.0000
225.0000	-0.7071	-0.7854	-0.7071	2.3562	135.0000
240.0000	-0.8660	-1.0472	-0.5000	2.0944	120.0000
270.0000	-1.0000	-1.5708	0.0000	1.5708	90.0000
300.0000	-0.8660	-1.0472	0.5000	1.0472	60.0000
330.0000	-0.5000	-0.5236	0.8660	0.5236	30.0000
360.0000	0.0000	0.0000	1.0000	0.0000	0.0000

task 4

Please reproduce the Excel table on the side

To refresh how to use the Math functions:

- MMULT(A,B) for matrix multiplications
- MINVERSE(A) for finding the inverse A^{-1}
- MDETERM for finding the determinant.



Matrix Functions

Multiplication

Matrix A	
2	3
4	5

Matrix B	
1	2
3	4

Matrix C	
11	16
19	28

Inverse

Matrix A	
-2.5	1.5
2	-1

Matrix B	
-2	1
1.5	-0.5

Matrix A	
7	-4
-4.75	2.75

Determinant

Determinant A
-2

Determinant A
-2

Determinant A
4

task 5

Refresh sort and filter function of Excel

task 5

Aim of this exercise is import txt file in excel.

Instructions:

1. Download from Blackboard the file called: Sort-filter.txt
2. Click open or double click to import.

Sometimes opens without problems but if not you need following steps:

1. The field on the file have a separator, specify delimited (not fixed width), click next.
2. The delimiters are commas, so uncheck tab and check commas. Click next and then the finish button.
3. On the newly rows 1 add the following headers to the columns: Brand, Type and Hours.
4. Save your Excel file named Example4.xlsx

	A	B	C
1	Brand	Type	Hours
2	Beta	Steel	563
3	Alpha	Nickel	720
4	Beta	Nickel	776
5	Alpha	Nickel	873
6	Alpha	Nickel	1000
7	Beta	Steel	490
8	Alpha	Brass	301
9	Alpha	Nickel	709
10	Alpha	Nickel	758
11	Alpha	Brass	420
12	Beta	Nickel	555
13	Alpha	Steel	614
14	Alpha	Steel	432
15	Beta	Brass	765
16	Alpha	Steel	703
17	Beta	Brass	930
18	Beta	Steel	590
19	Alpha	Steel	922
20	Alpha	Steel	615
21	Alpha	Steel	496

Task 5

To sort the data provide in example

Instructions:

1. For convenience copy the data to sheet 2. Use the plus sign on the tab list to make a new sheet.
2. On sheet 1, click on any cell withing the range A1:C101 and select using CTRL+A. Using shortcuts CTRL+C copy from Sheet 1 and CTRL+V and paste to sheet 2.
3. Select any cell column A (Brand) on the data on sheet 2. Click the $A \rightarrow Z$ icon in the Home/ Data/Sort & filter group. The data are now sorted with the Alpha records fist followed by Beta records.

Task 5

4. Select any cell column B (Type) on the data on sheet 2. Click the $A \rightarrow Z$ icon in the Home/ Data/Sort & filter group. The data are now sorted in groups Alpha and Brass, Beta and Brass, Alpha and Nickel etc.
5. Next, we are going to sort multiple field. Select anywhere in the table on sheet 2. Click the Custom sort command in the Home/ Data/Sort & filter group.
6. Using the drop-down arrows, sort first on Brand specifying Values and $A \rightarrow Z$, then on add (plus sign) a new level and sort Type specifying Values and $A \rightarrow Z$, and finally, add another level to sort on hours specifying Value and Largest to smalles.
7. Save the workbook

Task 6

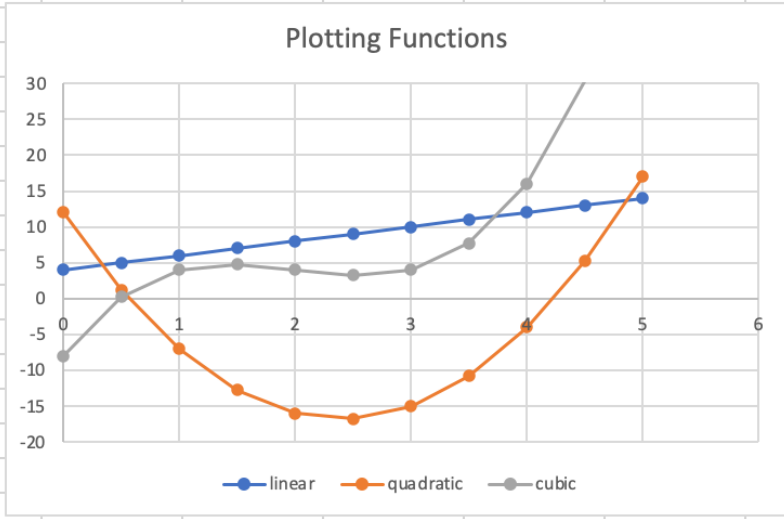
Make a chart with three functions plotted on it:

1. A linear (y=2x+4)
2. A quadratic function ($5x^2 - 24x + 12$)
3. A cubic function ($2x^3 - 13x^2 + 22x - 8$)

The aim of the example is to plot functions, using the chart of Excel.

You can find the charts in the insert ribbon.

Ploting Functions			
x	linear	quadratic	cubic
0.00	4.00	12.00	-8.00
0.50	5.00	1.25	0.25
1.00	6.00	-7.00	4.00
1.50	7.00	-12.75	4.75
2.00	8.00	-16.00	4.00
2.50	9.00	-16.75	3.25
3.00	10.00	-15.00	4.00
3.50	11.00	-10.75	7.75
4.00	12.00	-4.00	16.00
4.50	13.00	5.25	30.25
5.00	14.00	17.00	52.00



Task 6

How to do it

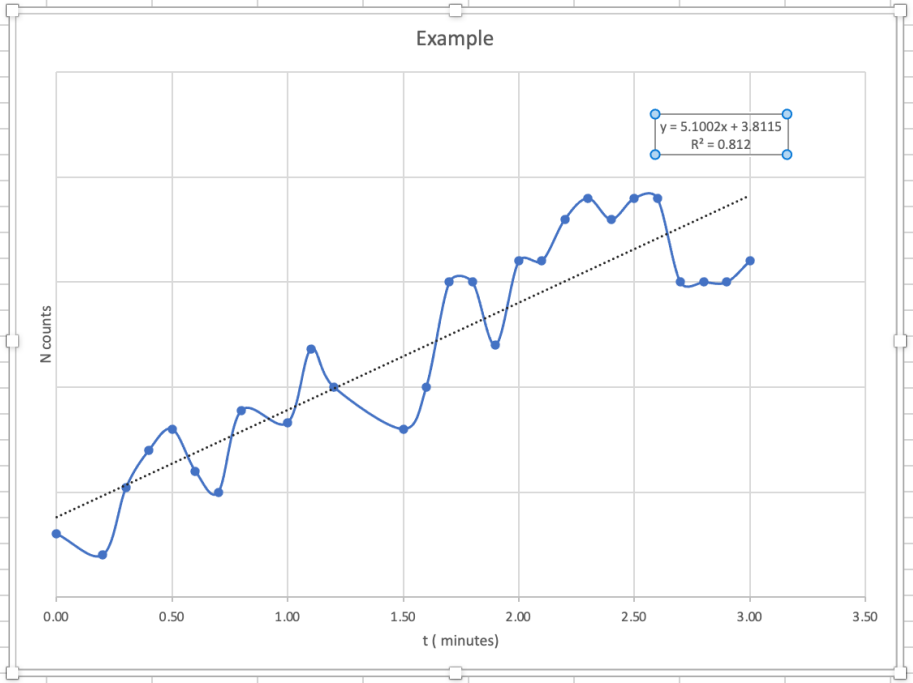
1. Open an Excel file. Enter the header text in row 1: x, linear, quadratic and cubic. In cells A2 and A3 enter he number 0 and 0.5, respectively. Select the two cells and pull the fill down to A12 to generate the series 0-5.
2. In B2:D4 enter the formulas:
    1. B4: =3*A2+4
    2. C4:=5*A2^2-24*A2+12
    3. D4: =2*A2^3-13*A2^2+22*A2-8
3. Select B4:D4 and double-click to generate all data.
4. Click anywhere within A2:D12 and use the formatting tools on Home/Number to give the data two decimal places.
5. Click again within A2:D12 and to insert charts, INSERT/ chart select scattered second plot.
6. Format the plot as in picture selecting the series (X-axis and Y-axis).

Task 7

This task aims to refresh how to plot a trendline and regression line using excel.

1. Download the filed Trendline from Blackboard
2. To Adding the trendline to the plot: right-click on any of the data points then select **Add Trendline**
3. **Under Trendline** Options, ensure that the trendline is **Linear**.

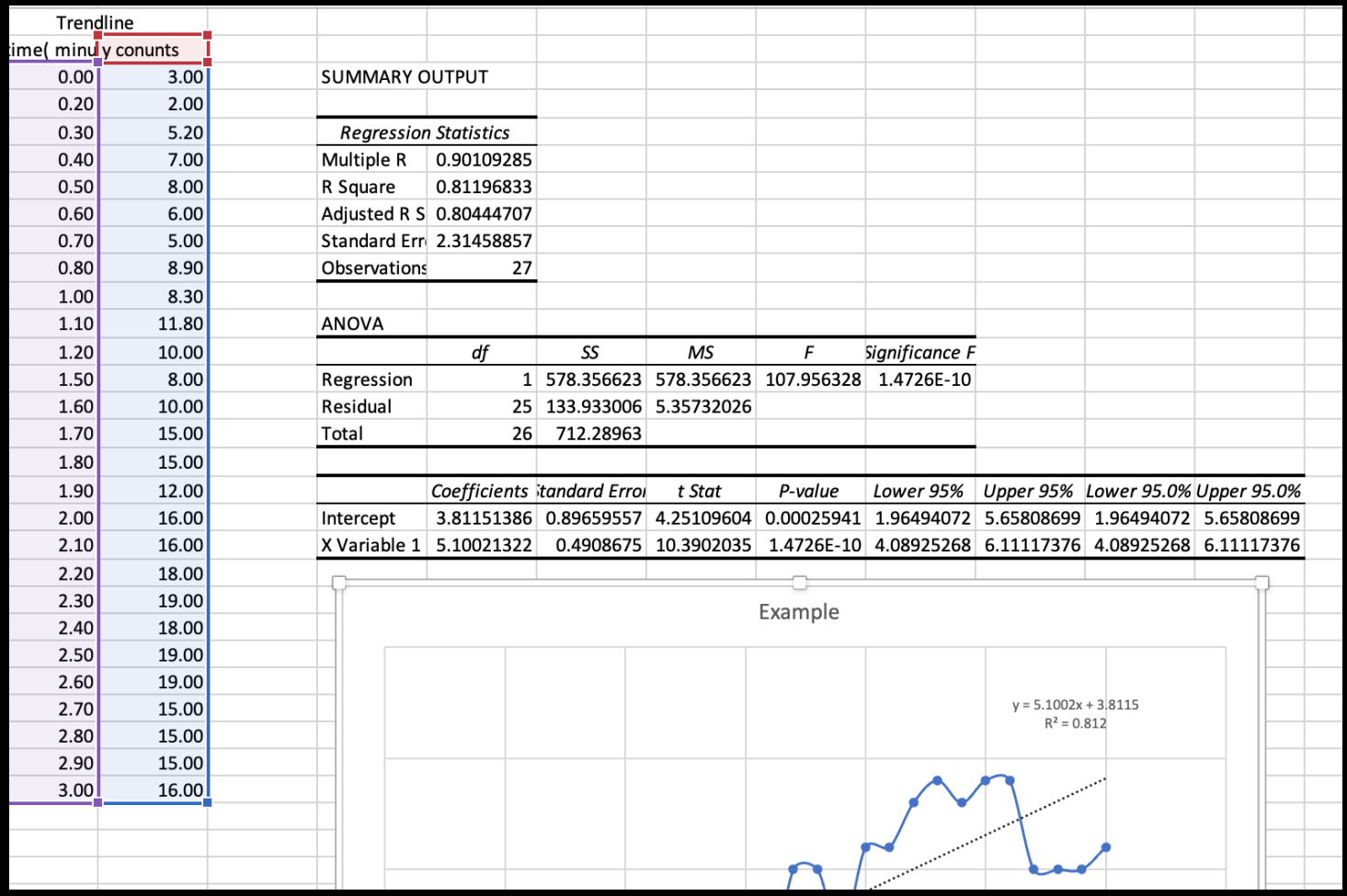
	Trendline	
t time(minu	y counts	Trendline
0.00	3.00	3.81
0.20	2.00	4.83
0.30	5.20	5.34
0.40	7.00	5.85
0.50	8.00	6.36
0.60	6.00	6.87
0.70	5.00	7.38
0.80	8.90	7.89
1.00	8.30	8.91
1.10	11.80	9.42
1.20	10.00	9.93
1.50	8.00	11.46
1.60	10.00	11.97
1.70	15.00	12.48
1.80	15.00	12.99
1.90	12.00	13.50
2.00	16.00	14.01
2.10	16.00	14.52
2.20	18.00	15.03
2.30	19.00	15.54
2.40	18.00	16.05
2.50	19.00	16.56
2.60	19.00	17.07
2.70	15.00	17.58
2.80	15.00	18.09
2.90	15.00	18.60
3.00	16.00	19.11



task 7

Regression line

- Click the Data tab,
- then click **Data Analysis** on the right of the tab (the analysis tool pack must be active).
- A window with a list of analysis tools will appear. Select Regression and then click OK.



Trendline	
ime(minu	y counts
0.00	3.00
0.20	2.00
0.30	5.20
0.40	7.00
0.50	8.00
0.60	6.00
0.70	5.00
0.80	8.90
1.00	8.30
1.10	11.80
1.20	10.00
1.50	8.00
1.60	10.00
1.70	15.00
1.80	15.00
1.90	12.00
2.00	16.00
2.10	16.00
2.20	18.00
2.30	19.00
2.40	18.00
2.50	19.00
2.60	19.00
2.70	15.00
2.80	15.00
2.90	15.00
3.00	16.00

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.90109285
R Square	0.81196833
Adjusted R S	0.80444707
Standard Err	2.31458857
Observations	27

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	578.356623	578.356623	107.956328	1.4726E-10
Residual	25	133.933006	5.35732026		
Total	26	712.28963			

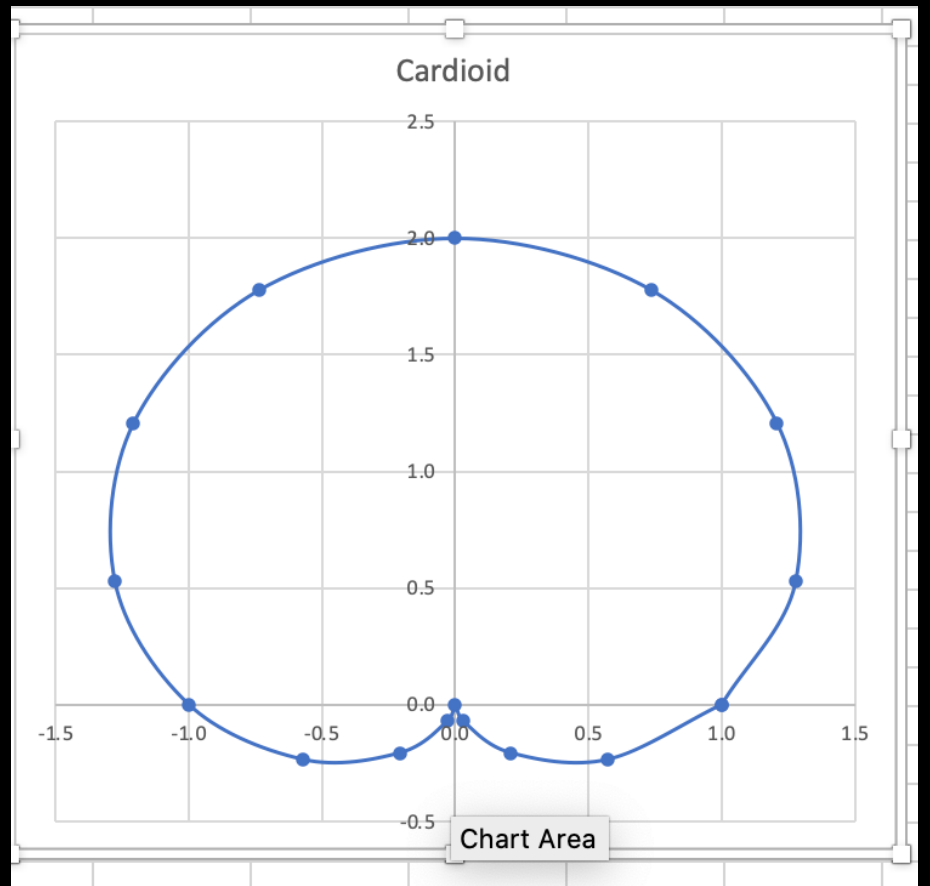
	Coefficients	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	3.81151386	0.89659557	4.25109604	0.00025941	1.96494072	5.65808699	1.96494072	5.65808699
X Variable 1	5.10021322	0.4908675	10.3902035	1.4726E-10	4.08925268	6.11117376	4.08925268	6.11117376

Extra task 1

Plot a cardioid

- $\begin{cases} x = (1 + \sin\theta)\cos\theta \\ y = (1 + \sin\theta)\sin\theta \end{cases}$

$1° < \theta < 360°$



Extra task 2

Download from Blackboard the file called Students Marks.xlsx.

1) Calculate total mark for each students, considering the weight of each assignment
2) Calculate the average Mark.
3) Sort the total mark from smallest to largest.
4) Calculate the mean for each assignment and overall result.
5) Plot a chart with results.