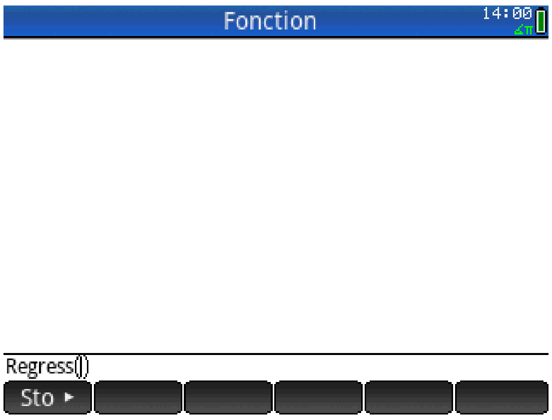
REGRESS v1.0

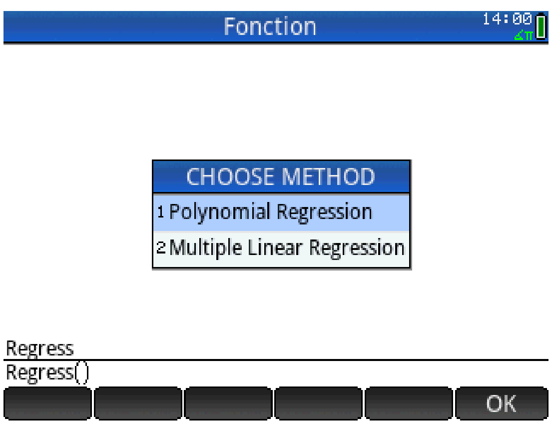
The program “Regress” allows you to perform Polynomial Regression and Multiple Linear Regression.

How to use:

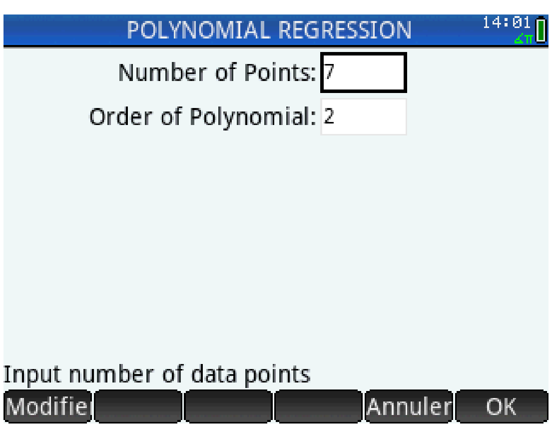
- First we run the program in the HOME window.



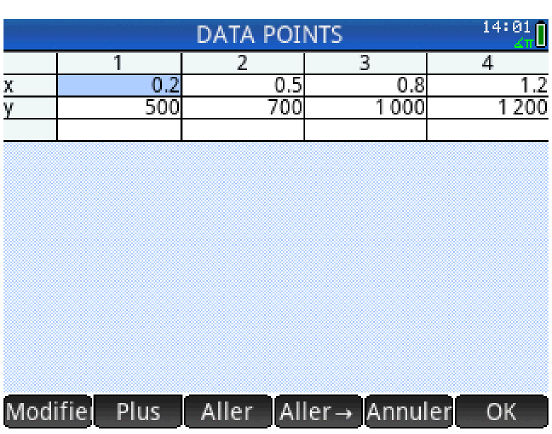
- Then we choose the method we want to employ: Polynomial Regression or Multiple Linear Regression.

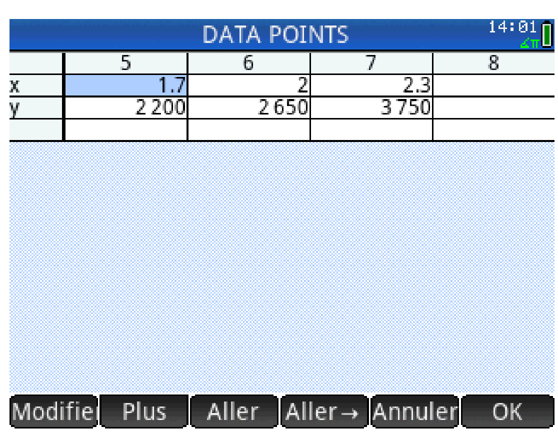


- Next, we input the number of data points and the order (degree) of the polynomial to be fit (if we chose Polynomial Regression) or the number of independent variables (if we chose Multiple Linear Regression).



- Finally, we compute the data points. The data points are stored as a matrix into the local variable M1.





Results:

- System of normal equations.

SYSTEM OF NORMAL EQUATIONS

	1	2	3	4
1	7	8.7	14.55	12 000
2	8.7	14.55	27.453	20 355
3	14.55	27.453	54.8835	39 358.5
4				

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This system is:

$$\begin{bmatrix} n & \sum_{i=1}^{n} X_i & \sum_{i=1}^{n} X_i^2 & \sum_{i=1}^{n} Y_i \\ \sum_{i=1}^{n} X_i & \sum_{i=1}^{n} X_i^2 & \sum_{i=1}^{n} X_i^3 & \sum_{i=1}^{n} X_i \times Y_i \\ \sum_{i=1}^{n} X_i^2 & \sum_{i=1}^{n} X_i^3 & \sum_{i=1}^{n} X_i^4 & \sum_{i=1}^{n} X_i^2 \times Y_i \end{bmatrix}$$

- Coefficients of the equation.

COEFFICIENTS

	1
a0:	604.094171
a1:	-233.960863
a2:	674.006895
4	

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- Error analysis.

ERROR ANALYSIS

	x	y	ŷ	St
1	0.2	500	584.262274	1 474 489.80
2	0.5	700	655.615463	1 028 775.51
3	0.8	1 000	848.289893	510 204.082
4	1.2	1 200	1 293.91106	264 489.796
5	1.7	2 200	2 154.24063	235 918.367
6	2	2 650	2 832.20002	875 561.224
7	2.3	3 750	3 631.48066	4 144 132.65
8				

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ERROR ANALYSIS

	ŷ	St	Sr	6
1	584.262274	1 474 489.80	7 100.13083	
2	655.615463	1 028 775.51	1 969.98713	
3	848.289893	510 204.082	23 015.9566	
4	1 293.91106	264 489.796	8 819.28782	
5	2 154.24063	235 918.367	2 093.92004	
6	2 832.20002	875 561.224	33 196.8484	
7	3 631.48066	4 144 132.65	14 046.8344	
8				

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Terminal

St= 8533571.42857
Sr= 90242.9651914
r^2= 0.98942494758
r= 0.994698420417

The program returns the coefficients of equation.

Fonction

Vector of coefficients is returned

Regress
Regress()

OK

Fonction

Regress
[674.006894597 -233.960863142 604.094170897]

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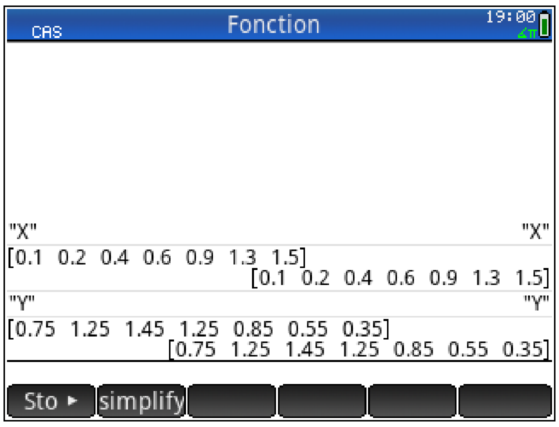
Why the data points are stored into M1?

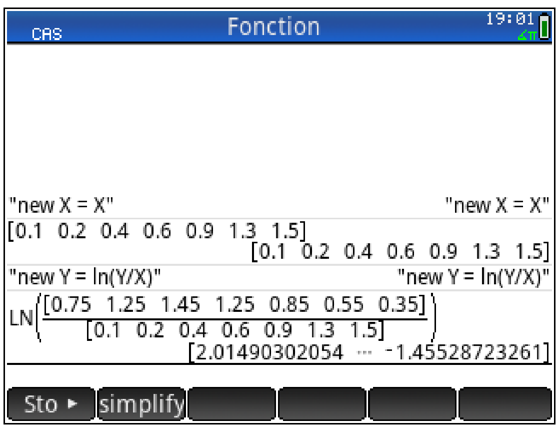
- It's not necessary to compute all the data points again if you want to repeat the process.
- It's easier to do linearization.

Example:

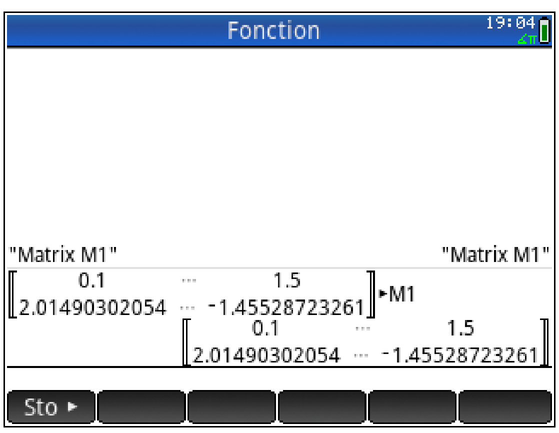
- In the CAS window, compute the data points.



- Then, do the necessary operations to each vector.



- Finally, combine those vectors into a matrix and store it into M1.



- Now, go to the HOME window and run the program Regress. You'll find out that the data you stored into M1 will be your data points.