

## Example : Input of a Sine table

**Fill in the template of the table :**

For example :

Template

Table type \* ?

Trigonometrical: sine

# of arguments

1

Argument 1

Name \*

angle

Type of number \* ?

sexagesimal

Unit \* ?

degree

# of integer places \* ?

1

# of fractional places \* ?

1

# of steps \* ?

90

---

Entry

Type of number \* ?

sexagesimal

Unit \* ?

no unit

# of integer places \* ?

1

# of fractional places \* ?

3

☐ Has a difference table
 

?

Close

Apply

**Input the the values of the argument :**

In our case we enter the first and the last values.

Then we select the whole column of arguments (shortcut W or S)

The screenshot shows a spreadsheet application with a toolbar at the top containing icons for file operations, formulas, and data manipulation. The spreadsheet has a header row with the word 'angle' in the first column, and two columns labeled '01' and '00'. Below the header, there are several rows of data. A blue selection box is visible over the first row of data, indicating it is selected.

The diagram shows a 10x10 grid. The first column is labeled '90' and is shaded gray. The second column is labeled '00' and is shaded blue. A green vertical line is positioned between the second and third columns. The remaining columns are labeled 10, 20, 30, 40, 50, 60, 70, 80, and 90, and are shaded light gray.

The screenshot shows a Google Sheets spreadsheet with two columns. The first column is labeled 'angle' and contains a list of values from 90 to 00. The second column is labeled 'In-between Interpolation' and is currently empty. A green vertical line is drawn between the two columns. The spreadsheet is displayed on a mobile device, as indicated by the URL bar at the top.

angle	In-between Interpolation
90	
80	
70	
60	
50	
40	
30	
20	
10	
00	

The values suggested by the tool appear in green. This means they need to be validated before being taken into account. This can be done with the validate button (shortcut SPACE).

← → ↺ ↻ <https://dishas.obspm.fr/adm/add-tableContent>

angle				
62	00			
63	00			
64	00			
65	00			
66	00			
67	00			
68	00			
69	00			
70	00			
71	00			
72	00			
73	00			
74	00			
75	00			
76	00			
77	00			
78	00			
79	00			
80	00			
81	00			
82	00			
83	00			
84	00			
85	00			
86	00			
87	00			
88	00			
89	00			
90	00			

Validate Selection

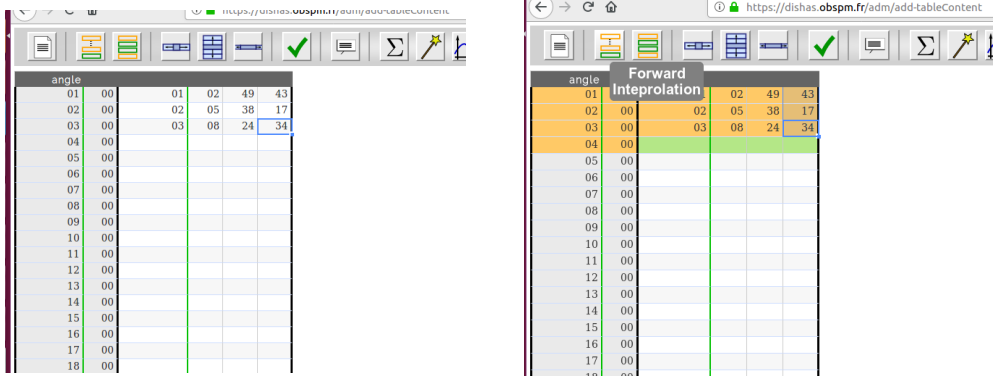
angle				
62	00			
63	00			
64	00			
65	00			
66	00			
67	00			
68	00			
69	00			
70	00			
71	00			
72	00			
73	00			
74	00			
75	00			
76	00			
77	00			
78	00			
79	00			
80	00			
81	00			
82	00			
83	00			
84	00			
85	00			
86	00			
87	00			
88	00			
89	00			
90	00			

## Input the values of the entry :

### With interpolation tools :

The most general way of filling the entry values is thanks to the interpolation tools.

In our example we enter the first 3 values and we wish to perform a parabolic interpolation to predict the fourth. To do so, we select the 3 values we just entered (and which will be used to evaluate the parameters of the parabole) and use the forward interpolation tool (shortcut S).

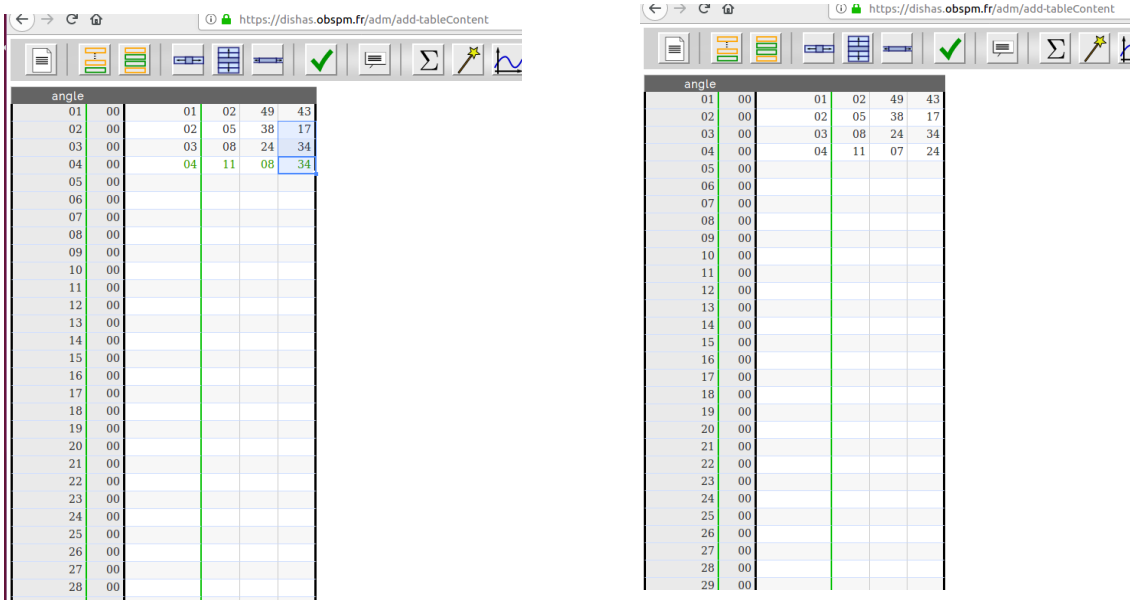


angle	00
01	00
02	00
03	00
04	00
05	00
06	00
07	00
08	00
09	00
10	00
11	00
12	00
13	00
14	00
15	00
16	00
17	00
18	00

angle	00
01	00
02	00
03	00
04	00
05	00
06	00
07	00
08	00
09	00
10	00
11	00
12	00
13	00
14	00
15	00
16	00
17	00
18	00

The values used to compute the parameters of the interpolation are colored in orange, while the target cells are colored in green.

Once the value is predicted, we correct it according to the table we are copying.



angle	00
01	00
02	00
03	00
04	00
05	00
06	00
07	00
08	00
09	00
10	00
11	00
12	00
13	00
14	00
15	00
16	00
17	00
18	00
19	00
20	00
21	00
22	00
23	00
24	00
25	00
26	00
27	00
28	00
29	00

angle	00
01	00
02	00
03	00
04	00
05	00
06	00
07	00
08	00
09	00
10	00
11	00
12	00
13	00
14	00
15	00
16	00
17	00
18	00
19	00
20	00
21	00
22	00
23	00
24	00
25	00
26	00
27	00
28	00
29	00

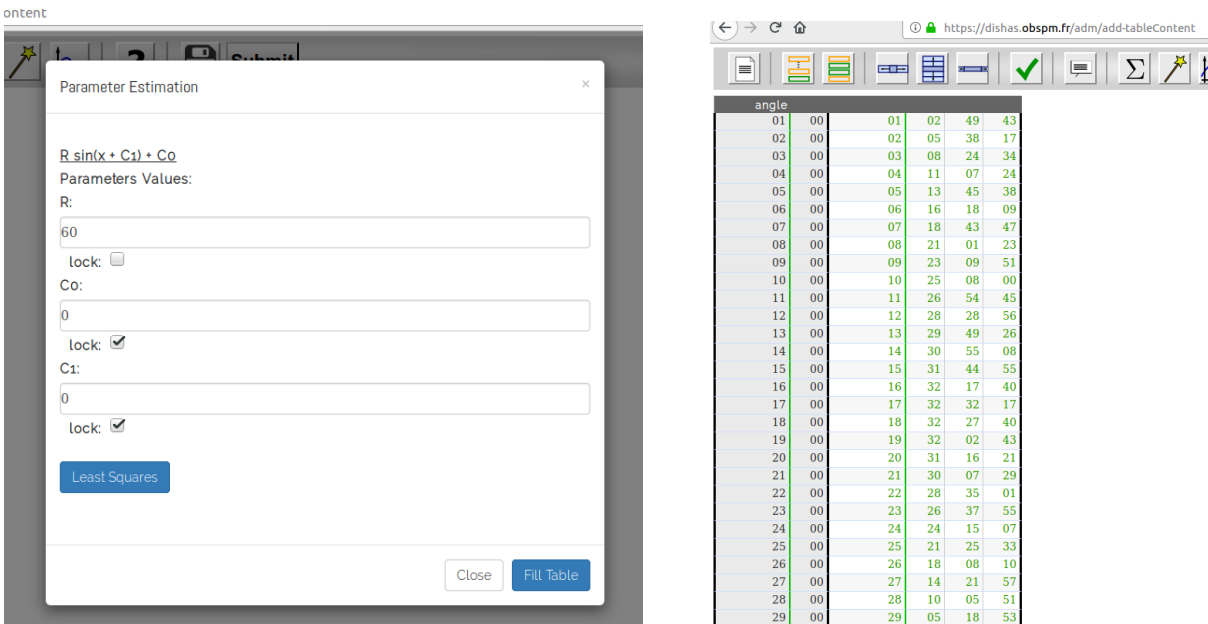
Tip : You can add +/-1 to the number in a selected cell by pressing Q (-1) or E (+1).

## By using a model :

If you know the parameters of the model your table is based on, you can use it to fill all the entry values. Just click on the 'Fill with model' button  and enter the value of the parameters.

In our example :

We know our Sine table uses a radius R of 60, so we enter this value and then we click on 'Fill Table'.



The 'Parameter Estimation' dialog box shows the model  $R \sin(x + C_1) + C_0$  with parameters R, C0, and C1. R is set to 60, C0 to 0, and C1 to 0. The 'Least Squares' button is highlighted. The 'angle' table shows a grid of values for angles 01 to 29, with columns 00, 01, 02, 49, and 43.

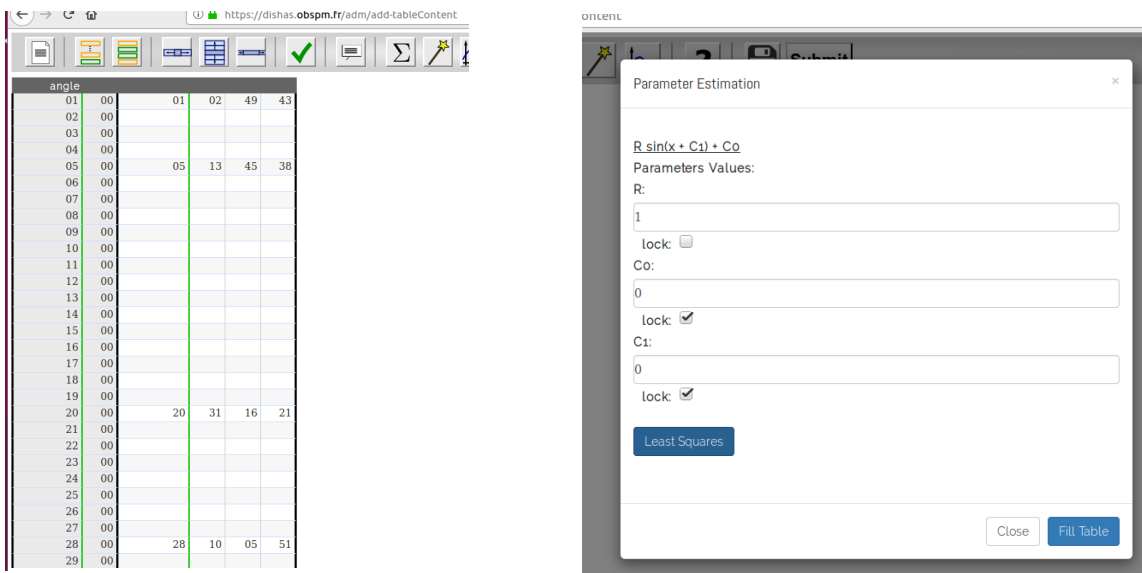
angle	01	00	01	02	49	43
01	00	01	02	49	43	
02	00	02	05	38	17	
03	00	03	08	24	34	
04	00	04	11	07	24	
05	00	05	13	45	38	
06	00	06	16	18	09	
07	00	07	18	43	47	
08	00	08	21	01	23	
09	00	09	23	09	51	
10	00	10	25	08	00	
11	00	11	26	54	45	
12	00	12	28	28	56	
13	00	13	29	49	26	
14	00	14	30	55	08	
15	00	15	31	44	55	
16	00	16	32	17	40	
17	00	17	32	32	17	
18	00	18	32	27	40	
19	00	19	32	02	43	
20	00	20	31	16	21	
21	00	21	30	07	29	
22	00	22	28	35	01	
23	00	23	26	37	55	
24	00	24	24	15	07	
25	00	25	21	25	33	
26	00	26	18	08	10	
27	00	27	14	21	57	
28	00	28	10	05	51	
29	00	29	05	18	53	

Then we can proceed to check and correct every suggested value according to the historical document.

## By evaluating the parameters of the model

If you don't know the value of the parameter in your table, you can enter some values of the entry (preferably the more significant ones for parameter estimation) and estimate the value of the parameters thanks to the least squares method.

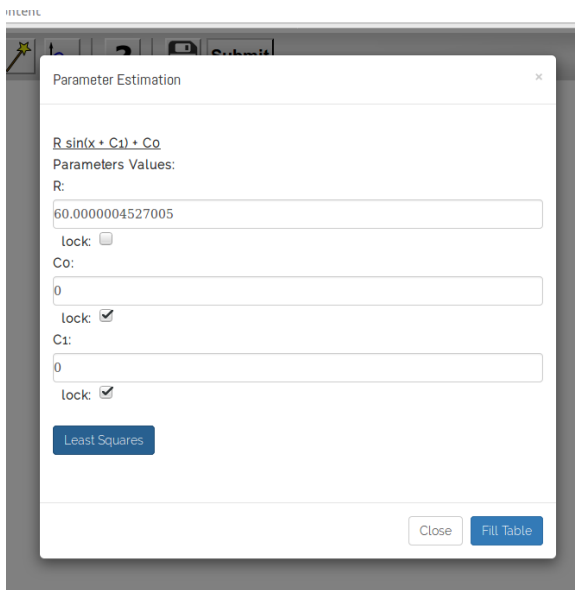
In our example, we fill in some entry values, and chose 1.0 as a starting value for R (LSQ is an iterative method so choosing a correct starting point is important).



The 'Parameter Estimation' dialog box shows the model  $R \sin(x + C_1) + C_0$  with parameters R, C0, and C1. R is set to 1, C0 to 0, and C1 to 0. The 'Least Squares' button is highlighted. The 'angle' table shows a grid of values for angles 01 to 29, with columns 00, 01, 02, 49, and 43. Some values are filled in: 05, 13, 45, 38 for angle 06; 20, 31, 16, 21 for angle 20; 28, 10, 05, 51 for angle 28.

angle	01	00	01	02	49	43
01	00	01	02	49	43	
02	00	02	05	38	17	
03	00	03	08	24	34	
04	00	04	11	07	24	
05	00	05	13	45	38	
06	00					
07	00					
08	00					
09	00					
10	00					
11	00					
12	00					
13	00					
14	00					
15	00					
16	00					
17	00					
18	00					
19	00					
20	00	20	31	16	21	
21	00					
22	00					
23	00					
24	00					
25	00					
26	00					
27	00					
28	00	28	10	05	51	
29	00					

After clicking on the 'Least Squares' button, several iterations are performed and the new value of the parameters are displayed. We can correct this value (here we would probably round the result to 60.0), perform more iterations, or fill the table.



Parameter Estimation

$R \sin(x + C_1) + C_0$

Parameters Values:

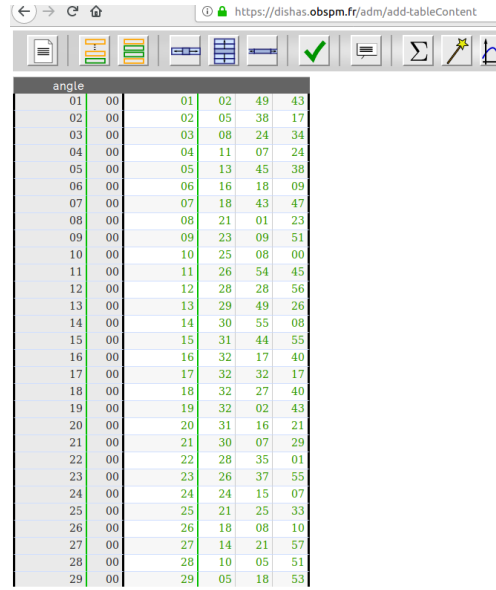
R: 60.0000004527005  
lock: ☐

C0: 0  
lock: ☒

C1: 0  
lock: ☒

Least Squares

Close Fill Table



angle				
01	00	01	02	49 43
02	00	02	05	38 17
03	00	03	08	24 34
04	00	04	11	07 24
05	00	05	13	45 38
06	00	06	16	18 09
07	00	07	18	43 47
08	00	08	21	01 23
09	00	09	23	09 51
10	00	10	25	08 00
11	00	11	26	54 45
12	00	12	28	28 56
13	00	13	29	49 26
14	00	14	30	55 08
15	00	15	31	44 55
16	00	16	32	17 40
17	00	17	32	32 17
18	00	18	32	27 40
19	00	19	32	02 43
20	00	20	31	16 21
21	00	21	30	07 29
22	00	22	28	35 01
23	00	23	26	37 55
24	00	24	24	15 07
25	00	25	21	25 33
26	00	26	18	08 10
27	00	27	14	21 57
28	00	28	10	05 51
29	00	29	05	18 53

Tip : When there are several parameters in the model, you can lock the value of some of them so they are not optimized by the LSQ method.

**NB : This parameter estimation is only an input help tool. It must NOT be used to evaluate the actual value of the parameters used by the historical actor (for example this procedure will not detect interpolated values or outliers).**