Initial experimental data (ORIGIN=1):

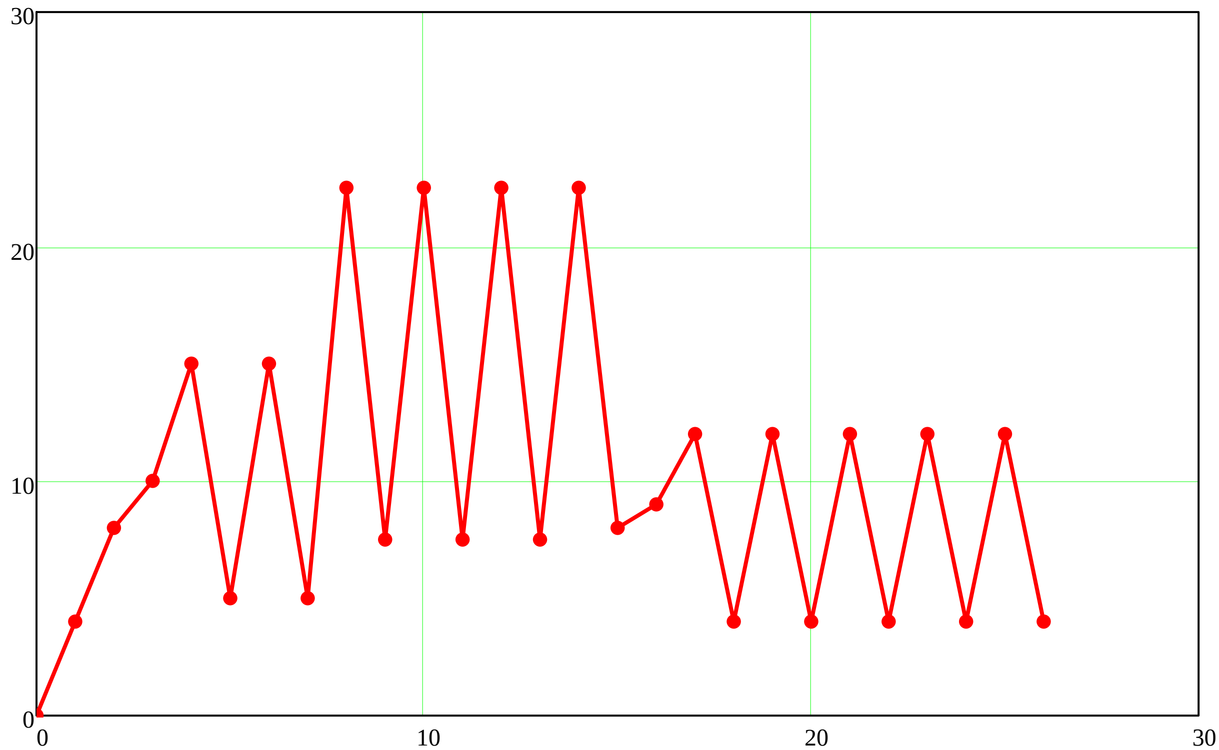
$$Data := (0\ \ 4\ \ 8\ \ 10\ \ 15\ \ 5\ \ 15\ \ 5\ \ 22.5\ \ 7.5\ \ 22.5\ \ 7.5\ \ 22.5\ \ 7.5\ \ 22.5\ \ 8\ \ 9\ \ 12\ \ 4\ \ 12\ \ 4\ \ 12\ \ 4\ \ 12\ \ 4\ \ 12\ \ 4)^T$$

```
t :=  | s ← 0
      | for  j ∈ 1 .. rows(Data)
      |    | S_j ← s
      |    | s ← s + 1
      | S
```

$t^T =$

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	...

Plot 1



Correction of initial data with 2 different conditions.

1. Checking the condition that the last and first elements of a number of data must be equal "Data_N" = "Data_1":

Data_check_1 :=
```
n ← rows(Data)
"Checking the condition that the last and first elements of a number of data must be equal "Data_N" = "Data_1" "
Data_n ← Data_1  if  Data_n ≠ Data_1
return  Data   otherwise
Data
```

2. From the resulting data vector (after the condition 1) is necessary to save the only real maxima and minima:

Data_check_2 := augment(t, Data_check_1)

w := 1

Maxima := localmax(Data_check_2, w)

Minima := localmin(Data_check_2, w)

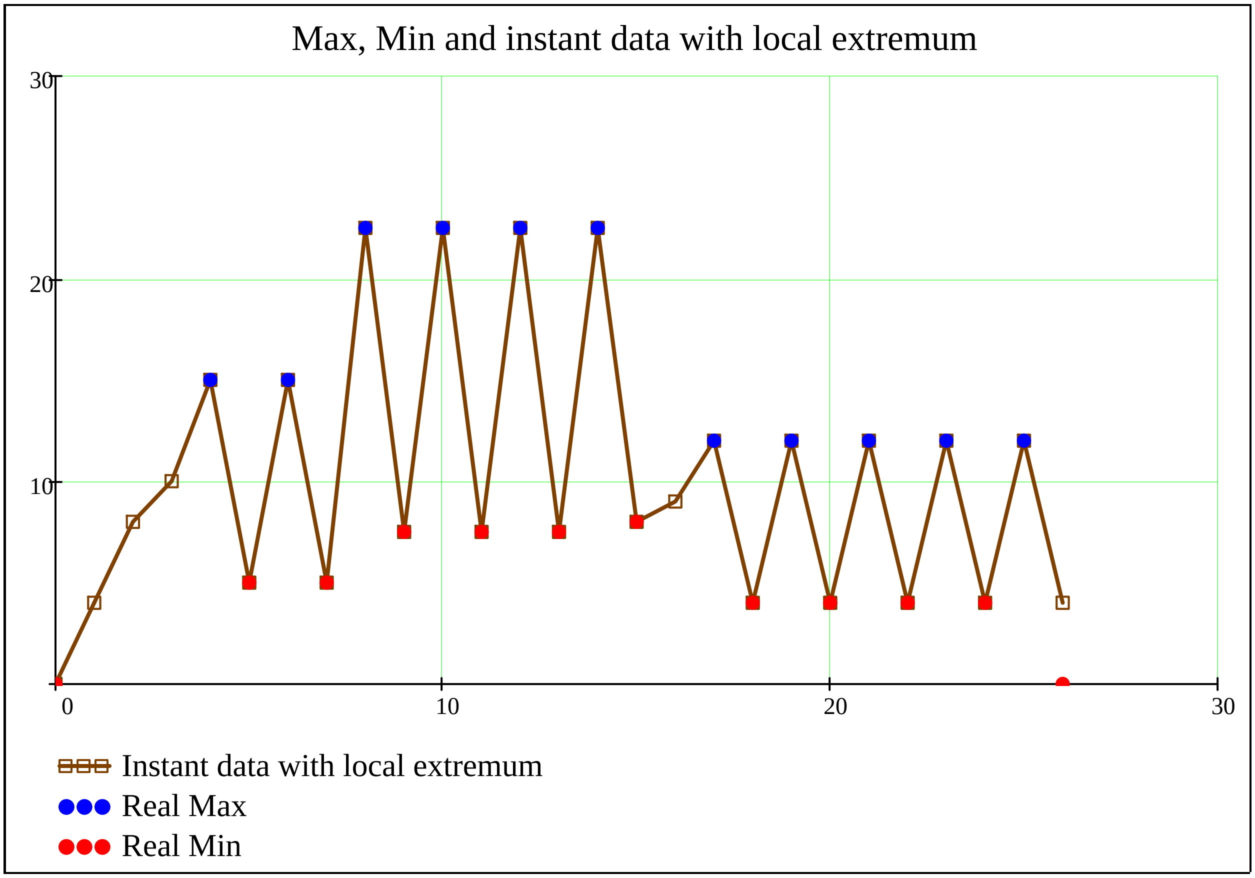
Extremum := csort(stack(Minima, Maxima), 1)

Extremum =

	1	2
1	0	0
2	4	15
3	5	5
4	6	15
5	7	5
6	8	22.5
7	9	7.5
8	10	22.5
9	11	7.5
10	12	22.5
11	13	7.5
12	14	22.5
13	15	8
14	17	12
15	18	4
16	19	...

$\text{Minimum} := \text{Minima}^{\langle 2 \rangle}$

$$\text{Maximum} := \begin{vmatrix} \text{Maximum} \leftarrow \text{stack}\left(\text{Maxima}^{\langle 2 \rangle}, \text{NaN}\right) \;\; \text{if} \;\; \text{rows}\left(\text{Maxima}^{\langle 2 \rangle}\right) \neq \text{rows}\left(\text{Minima}^{\langle 2 \rangle}\right) \\ \text{Maximum} \leftarrow \text{Maxima}^{\langle 2 \rangle} \;\; \text{otherwise} \end{vmatrix}$$



Maxima =

	1	2
1	4	15
2	6	15
3	8	22.5
4	10	22.5
5	12	22.5
6	14	22.5
7	17	12
8	19	12
9	21	12
10	23	12
11	25	12

Minima =

	1	2
1	0	0
2	5	5
3	7	5
4	9	7.5
5	11	7.5
6	13	7.5
7	15	8
8	18	4
9	20	4
10	22	4
11	24	4
12	26	0

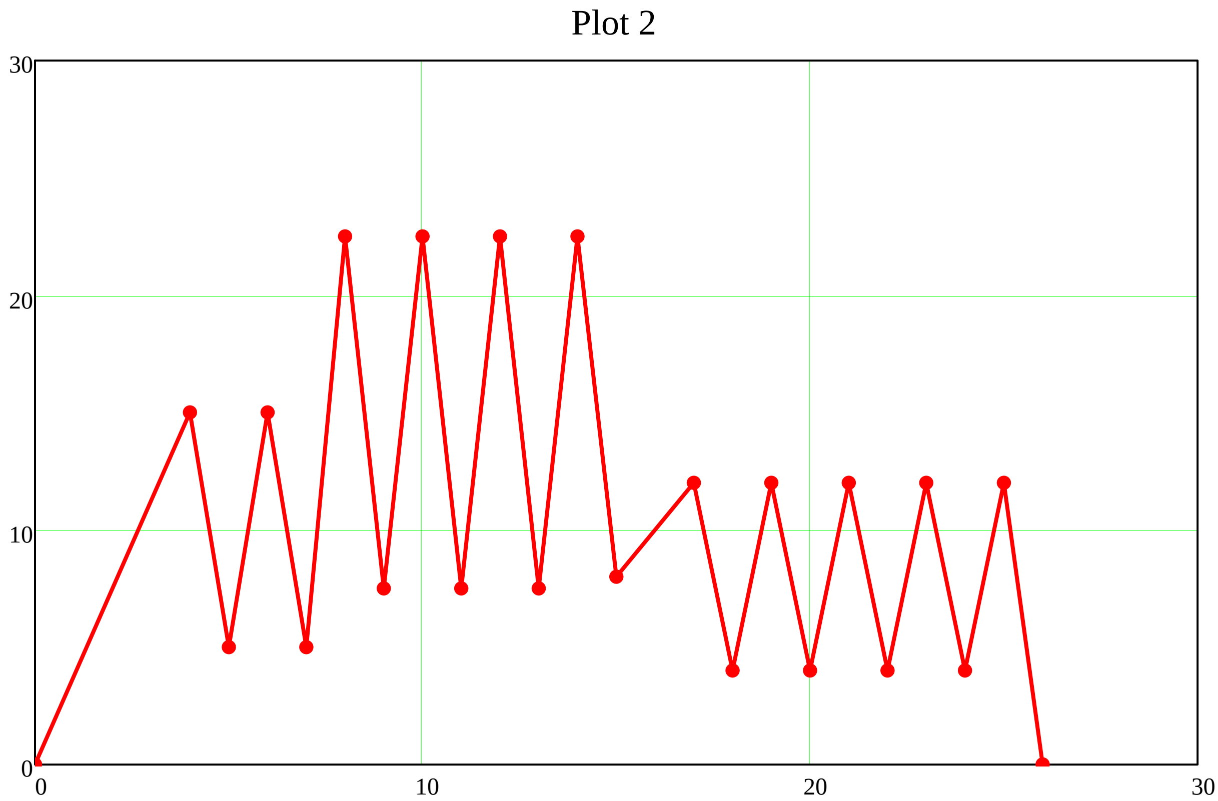
Minimum =

	1
1	0
2	5
3	5
4	7.5
5	7.5
6	7.5
7	8
8	4
9	4
10	4
11	4
12	0

Maximum =

	1
1	15
2	15
3	22.5
4	22.5
5	22.5
6	22.5
7	12
8	12
9	12
10	12
11	12
12	NaN

In the following procedure I should come to the equivalent "Plot 3 (closing)", which is shown below) by subtracting the minimum amplitude in "Plot 2" (first minimum amplitude is equal to $\Delta = Max_i - Min_i = Max_7 - Min_7 = 12 - 8 = 4$) and rearranging it again after each subtraction. The result should be left only 3 numbers (after the second procedure, this number will be equal to: 2 minimum (min(Extremum)) and a 1 maximum max(Extremum) of corrected data in " Extremum ") that will determine "Plot 3 (closing)".



Here I created a program block for only one first cycle with minimum amplitude:

```
(Max, Min, Δ, Num, Maximum_new, Minimum_new)ᵀ :=
  | Maximum_cycle ← Maximum
  | Minimum_cycle ← Minimum
  | for  i ∈ 1 .. (rows(Minimum_cycle) − 1)
  |   | Δ_i ← (Maximum_cycle)_i − (Minimum_cycle)_i
  |   | Δ_matrix ← min(Δ)
  |   | Num ← match(min(Δ), Δ)_1
  |   | Max ← Maximum_cycle_Num
  |   | Min ← Minimum_cycle_Num
  | Maximum_new ← stack(submatrix(Maximum_cycle, 1, match(min(Δ), Δ)_1 − 1, 1, 1), submatrix(Maximum_cycle, ma
  | Minimum_new ← stack(submatrix(Minimum_cycle, 1, match(min(Δ), Δ)_1 − 1, 1, 1), submatrix(Minimum_cycle, mat
  | (Max  Min  Δ  Num  Maximum_new  Minimum_new)ᵀ
```

$$\begin{pmatrix} \text{Max} \\ \text{Min} \\ \Delta \\ \text{Num} \\ \text{Maximum\_new} \\ \text{Minimum\_new} \end{pmatrix} = \begin{pmatrix} 12 \\ 8 \\ \{11,1\} \\ 7 \\ \{11,1\} \\ \{11,1\} \end{pmatrix}$$

Δ =

	1
1	15
2	10
3	17.5
4	15
5	15
6	15
7	4
8	8
9	8
10	8
11	8

Maximum_new =

	1
1	15
2	15
3	22.5
4	22.5
5	22.5
6	22.5
7	12
8	12
9	12
10	12
11	NaN

Minimum_new =

	1
1	
2	
3	
4	7
5	7
6	7
7	
8	
9	
10	
11	

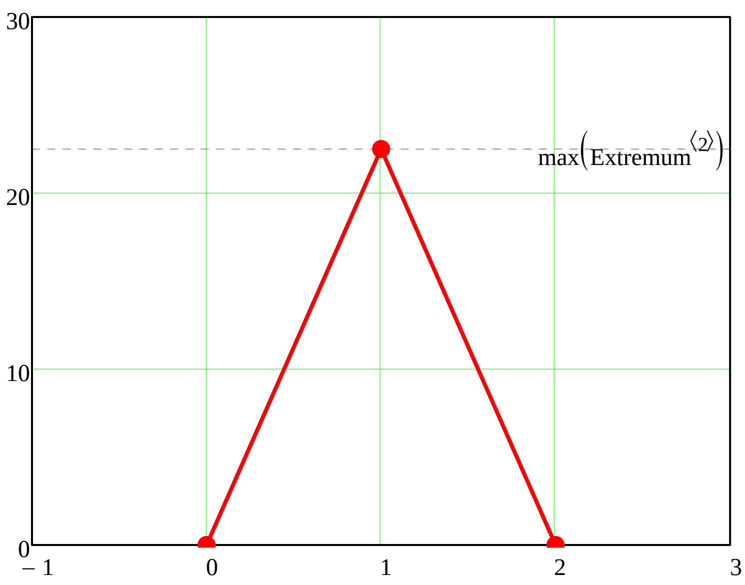
But how can I organize a program block for all of the data in " Extremum"?

$$\begin{pmatrix} Max \\ Min \end{pmatrix} :=$$

```
Maximum_cycle ← Maximum
Minimum_cycle ← Minimum
for i ∈ 1 .. (rows(Minimum_cycle) − 1)
    Δ_i ← (Maximum_cycle)_i − (Minimum_cycle)_i
    Δ_matrix ← min(Δ)
    Num ← match(min(Δ), Δ)_1
    Max_i ← Maximum_cycle_Num
    Min_i ← Minimum_cycle_Num
    Maximum_cycle ← stack(submatrix(Maximum_cycle, 1, Num_i − 1, 1, 1), submatrix(Maximum_cycle, Num_i + 1, rows(Maxim
    Minimum_cycle ← stack(submatrix(Minimum_cycle, 1, Num_i − 1, 1, 1), submatrix(Minimum_cycle, Num_i + 1, rows(Minimu
(Max  Min)^T
```

$$Data\_exit := \begin{pmatrix} 0 \\ 22.5 \\ 0 \end{pmatrix} \qquad t := \begin{pmatrix} 0 \\ 1 \\ 2 \end{pmatrix}$$

Plot 3 (closing)



$max\left(Extremum^{\langle 2 \rangle}\right) = 22.5$

$min\left(Extremum^{\langle 2 \rangle}\right) = 0$

Here are the final results that I want to get after all data processing (they are manually entered).

$$Number := \begin{pmatrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \end{pmatrix} \qquad Min := \begin{pmatrix} 8 \\ 4 \\ 4 \\ 4 \\ 4 \\ 5 \\ 5 \\ 7.5 \\ 7.5 \\ 7.5 \\ 0 \end{pmatrix} \qquad Max := \begin{pmatrix} 12 \\ 12 \\ 12 \\ 12 \\ 12 \\ 15 \\ 15 \\ 22.5 \\ 22.5 \\ 22.5 \\ 22.5 \end{pmatrix}$$

$$\Delta := \overrightarrow{(Max - Min)}$$

Exit_table := stack[("Number" "Min" "Max" "Δ"), augment(Number, Min, Max, Δ)]

Exit_table =

"Number"	"Min"	"Max"	"Δ"
1	8	12	4
2	4	12	8
3	4	12	8
4	4	12	8
5	4	12	8
6	5	15	10
7	5	15	10
8	7.5	22.5	15
9	7.5	22.5	15
10	7.5	22.5	15
11	0	22.5	22.5

$\text{tch}(\min(\Delta), \Delta)_1 + 1, \text{rows}(\text{Maximum\_cycle}), 1, 1))$

$\text{ch}(\min(\Delta), \Delta)_1 + 1, \text{rows}(\text{Minimum\_cycle}), 1, 1))$

0
5
5
.5
.5
.5
4
4
4
4
0

$\text{ıum\_cycle)}, 1, 1))$

$\text{.m\_cycle)}, 1, 1))$