Started on	Saturday, 27 April 2024, 4:23 PM
State	Finished
Completed on	Saturday, 27 April 2024, 4:39 PM
Time taken	16 mins 20 secs
Grade	3.00 out of 3.00 (100%)

## Question $\bf 1$

Correct

Mark 3.00 out of 3.00

Assuming the Gauss-Seidel parallel implementation on a distributed memory machine shown in the video with:

- Row-wise distribution of the matrix to P processors where each processor gets n/P consecutive rows;
- Task definition = Block of n/P consecutive rows by c columns, i.e. each processor executes several fine grain tasks, each working on a submatrix within the segment owned by the processor;
- An iteration of the inner loop has an associated cost  $T_{\mbox{\scriptsize body}}.$

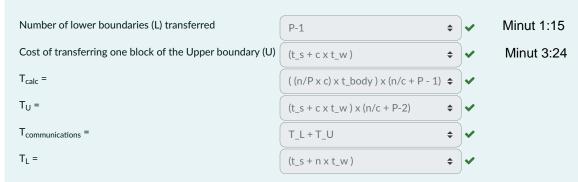
Match each contribution to the parallel execution time on P processors (T<sub>p</sub>) with the appropriate expression.

 $T_p = T_{calculations} + T_{communications}$ 

In the video:  $T_{communications} = T_{overheads}$  We could also call it  $T_{datasharing}$ 

Notation: Since the section for defining answers does not allow the usage of subscripts and superscripts,

- The underscore "\_" in the answers is used for introducing a subscript.
- The circumflex "^" in the answers is used for introducing a superscript.



Your answer is correct.

The correct answer is:

Number of lower boundaries (L) transferred  $\rightarrow$  P-1,

Cost of transferring one block of the Upper boundary (U)  $\rightarrow$  (t\_s + c x t\_w),

$$T_{calc}$$
 =  $\rightarrow$  ( (n/P x c) x t\_body ) x (n/c + P - 1),

$$T_U = \rightarrow (t_s + c \times t_w) \times (n/c + P-2),$$

$$T_{communications} = \rightarrow T_L + T_U,$$

$$T_L = \rightarrow (t_s + n \times t_w)$$