

Sorting 16-bit data

SORTTBL(_U)

FX5S

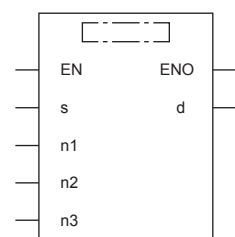
FX5UJ

FX5U

FX5UC

These instructions sort data lines in the data table (sorting source) having ((n1)×(n2)) points specified by (s) in the ascending order based on the group data in the column number (n3), and store the result in the data table (sorting result) having ((n1)×(n2)) points specified by (d).

Ladder diagram	Structured text
	<pre>ENO:=SORTTBL(EN,s,n1,n2,n3,d); ENO:= SORTTBL_U(EN,s,n1,n2,n3,d);</pre>
FBD/LD	



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Setting data

■Descriptions, ranges, and data types

Operand	Description	Range	Data type	Data type (label)
(s)	SORTTBL SORTTBL_U	Head device number storing the data table	16-bit signed binary 16-bit unsigned binary	ANY16 ANY16_U
(n1)	Number of data (lines)	1 to 32	16-bit unsigned binary	ANY16_U
(n2)	Number of group data (columns)	1 to 6	16-bit unsigned binary	ANY16_U
(d)	SORTTBL SORTTBL_U	Head device number for storing the operation result	16-bit signed binary 16-bit unsigned binary	ANY16 ANY16_U
(n3)	Column number of group data (column) used as the basis of sorting	—	16-bit unsigned binary	ANY16_U
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

■Applicable devices

Operand	Bit	Word				Double word		Indirect specification	Constant			Others
	X, Y, M, L, SM, F, B, SB, S	T, ST, C, D, W, SD, SW, R	U□\G□	Z	LC	LZ			K, H	E	\$	
(s)	—	○	—	—	—	—	○	—	—	—	—	—
(n1)	○	○	○	○	—	—	○	○	—	—	—	—
(n2)	○	○	○	○	—	—	○	○	—	—	—	—
(d)	—	○	—	—	—	—	○	—	—	—	—	—
(n3)	○	○	○	○	—	—	○	○	—	—	—	—

Processing details

- These instructions sort data lines in the data table (sorting source) having $((n1) \times (n2))$ points specified by (s) in the ascending order based on the group data in the column number (n3), and store the result in the data table (sorting result) having $(n1 \times n2)$ points specified by (d).
- The data table configuration is explained in an example in which the sorting source data table has 3 lines and 4 columns ($n1 = K3$, $n2 = K4$). For the sorting result data table, understand (s) as (d).

		Number of groups (n2 = K4)			
		Column No. 1	Column No. 2	Column No. 3	Column No. 4
		Control number	Height	Weight	Age
Number of data (n1) = 3	Line No. 1	(s)	(s)+3	(s)+6	(s)+9
	Line No. 2	(s)+1	(s)+4	(s)+7	(s)+10
	Line No. 3	(s)+2	(s)+5	(s)+8	(s)+11

- When the command input turns on, data sorting is started. Data sorting is completed after (n1) scans, and the instruction execution complete flag SM8029 is set to on.
- The following table shows an operation example based on the sorting source data below. It is recommended to put a serial number such as a control number in the first column so that the original line number can be estimated based on the contents.

		Number of groups (n2 = K4)			
		Column No. 1	Column No. 2	Column No. 3	Column No. 4
		Control number	Height	Weight	Age
Number of data (n1) = 5	Line No. 1	(s)	(s)+5	(s)+10	(s)+15
		1	150	45	20
	Line No. 2	(s)+1	(s)+6	(s)+11	(s)+16
		2	180	50	40
	Line No. 3	(s)+2	(s)+7	(s)+12	(s)+17
		3	160	70	30
	Line No. 4	(s)+3	(s)+8	(s)+13	(s)+18
		4	100	20	8
	Line No. 5	(s)+4	(s)+9	(s)+14	(s)+19
		5	150	50	45

- Sorting result when the instructions are executed with (n3) = K2 (column No. 2)

		Number of groups (n2 = K4)			
		Column No. 1	Column No. 2	Column No. 3	Column No. 4
		Control number	Height	Weight	Age
Number of data (n1) = 5	Line No. 1	(d)	(d)+5	(d)+11	(d)+15
		4	100	20	8
	Line No. 2	(d)+2	(d)+6	(d)+10	(d)+16
		1	150	45	20
	Line No. 3	(d)+1	(d)+7	(d)+12	(d)+17
		5	150	50	45
	Line No. 4	(d)+3	(d)+8	(d)+13	(d)+18
		3	160	70	30
	Line No. 5	(d)+4	(d)+9	(d)+14	(d)+19
		2	180	50	40

- Sorting result when the instructions are executed with (n3) = K3 (column No. 3)

		Number of groups (n2 = K4)			
		Column No. 1	Column No. 2	Column No. 3	Column No. 4
		Control number	Height	Weight	Age
Number of data (n1) = 5	Line No. 1	(d)	(d)+5	(d)+10	(d)+15
		4	100	20	8
	Line No. 2	(d)+1	(d)+6	(d)+11	(d)+16
		1	150	45	20
	Line No. 3	(d)+2	(d)+7	(d)+12	(d)+17
		2	180	50	40
	Line No. 4	(d)+3	(d)+8	(d)+13	(d)+18
		5	150	50	45
	Line No. 5	(d)+4	(d)+9	(d)+14	(d)+19
		3	160	70	30

Precautions

- Do not change the contents of operands and data during operation.
- To execute these instructions again, set the command input to off once, then on again.
- These instructions can only be used once in any program.
- When specifying the same device in (s) and (d), the source data is overwritten by the data acquired by sorting. Take special care so that the contents of (s) are not changed until execution is completed.

Operation error

Error code (SD0/SD8067)	Description
1811H	These instructions are used more than once.
2820H	The device range specified by (s) exceeds the corresponding device range.
	The device range specified by (d) exceeds the corresponding device range.
3405H	The value specified by (n1) is outside the following range. 1 to 32
	The value specified by (n2) is outside the following range. 1 to 6
	The value specified by (n3) is outside the following range. 1 to (n2)