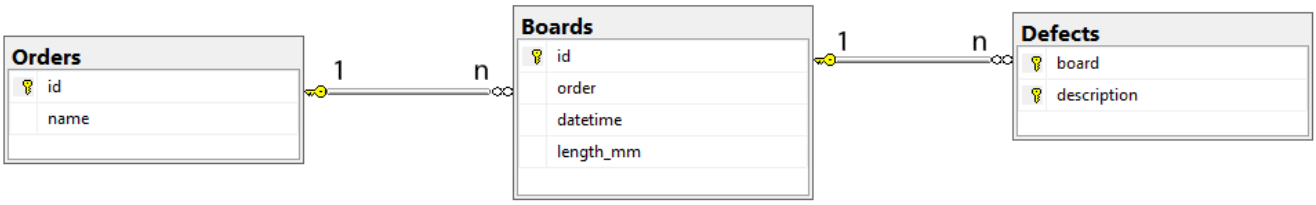
Boards Database Exercise

Given is a system that measures the length of boards and detects damage on them. There can be none, one or many demages per board. The boards are divided into orders, i.e. a certain, variable number of boards are always scanned per order. The system processes only one order at a time, so there can be no time overlap between the orders.

The detected data is written to a database with the following basic structure:



We assume that the database is currently filled with the following values:

Orders:

id	name
1	Order 1
2	Order 2
3	Order 3
4	Order 4

Boards:

id	order	datetime	length_mm
11	1	2023-01-01 07:00:00.000	4200
8	1	2023-01-01 07:00:00.430	4250
10	1	2023-01-01 07:00:01.150	4180
3	1	2023-01-01 07:00:03.110	4060
2	2	2023-01-01 07:15:23.500	3520
4	2	2023-01-01 07:15:25.123	3580
9	2	2023-01-01 07:15:25.670	3610
1	2	2023-01-01 07:15:26.330	3840
5	3	2023-01-01 08:23:15.680	5200
7	3	2023-01-01 08:23:16.030	5220
6	4	2023-01-01 08:50:01.330	4060

Defects:

board	description
4	Bark
4	Black knot
4	Wane
6	Knot
8	Bark
8	Knot
10	Split

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For an evaluation we need an overview of the orders, which should include the following details:

- Order ID
- Order Name
- Number of boards in this order
- Number of boards with any defect in this order
- Start date and time of the order (date and time of the first board in this order)
- End date and time of the order (date and time of the last board in this order)
- Elapsed time since last order in minutes
- Sum of the board lengths in this order in millimeters
- Average of the board lengths in this order in millimeters
- Standard deviation of the board lengths in this order in millimeters
- Average time interval between the boards of this order (note: the time between the orders must not be taken into account here, only the times within this order).

Implement a query that calculates and outputs the required information. You can use a database system of your choice (Microsoft SQL Server, MySQL, MariaDB, MongoDB, …). Important is, that you use **only the Database Query Language** (SQL in case of relational database) to solve the problem. It is not allowed to fetch data and do calculaltions in other software programs. The calculations must be made by the database management system, and only by it.

The desired result depending on the data actually stored in the database is shown at the next page.

order_id	order_name	no_boards	no_boards_with_defects	order_start	order_end
1	Order 1	4	2	2023-01-01 07:00:00.000	2023-01-01 07:00:03.110
2	Order 2	4	1	2023-01-01 07:15:23.500	2023-01-01 07:15:26.330
3	Order 3	2	0	2023-01-01 08:23:15.680	2023-01-01 08:23:16.030
4	Order 4	1	1	2023-01-01 08:50:01.330	2023-01-01 08:50:01.330

time_interval_to_previous_order_minutes	sum_length_mm	avg_length_mm
NULL	16690	4172
15	14550	3637
68	10420	5210
27	4060	4060

stdev_length_mm	avg_time_interval_between_boards_milliseconds
80.57088	1036
140.0893	943
14.14214	350
0	0