

Calculate Metrics across Columns

You can use a variety of mathematical and statistical functions to calculate metrics within a column.

- See *Aggregate Functions*.
- See *Math Functions*.

To calculate metrics across columns, you can use a generalized version of the following example.

Source:

Your dataset tracks swimmer performance across multiple heats in a race, and you would like to calculate best, worst, and average times in seconds across all three heats. Here's the data:

| Racer | Heat1 | Heat2 | Heat3 |
|---------|-------|-------|-------|
| Racer X | 37.22 | 38.22 | 37.61 |
| Racer Y | 41.33 | DQ | 38.04 |
| Racer Z | 39.27 | 39.04 | 38.85 |

In the above data, Racer Y was disqualified (DQ) in Heat 2.

Transformation:

To compute the metrics, you must bundle the data into an array, break out the array into separate rows, and then calculate your metrics by grouping. Here are the steps:

1. When the data is imported, you may need to create a header for each row:

| | |
|----------------------------|---------------------------|
| Transformation Name | Rename columns with a row |
| Parameter: Option | Use row as header |
| Parameter: Row | 1 |

2. The columns containing heat time data may need to be retyped. From the drop-down next to each column name, select Decimal type.
3. The DQ value in the Heat2 column is invalid data for Decimal type. You can use the following transformation to turn it into a missing value. For purposes of calculating averages, you may or may not want to turn invalid data into zeroes or blanks. In this case, replacing the data as 0.00 causes improper calculations for the metrics.

| | |
|--------------------------------|--------------------------|
| Transformation Name | Replace text or patterns |
| Parameter: Column | Heat2 |
| Parameter: Find | 'DQ' |
| Parameter: Replace with | ' ' |

4. Use the following to gather all of the heat data into two columns:

| | |
|----------------------------|-----------------|
| Transformation Name | Unpivot columns |
|----------------------------|-----------------|

| | |
|------------------------------|-------------------|
| Parameter: Columns | Heat1,Heat2,Heat3 |
| Parameter: Group size | 1 |

5. You can now rename the two columns. Rename `key` to `HeatNum` and `value` to `HeatTime`.
6. You may want to delete the rows that have a missing value for `HeatTime`:

| | |
|-----------------------------|--------------------|
| Transformation Name | Delete rows |
| Parameter: Condition | ISMISSING([value]) |

7. You can now perform calculations on this column. The following transformations calculate minimum, average (mean), and maximum times for each racer:

| | |
|-----------------------------------|----------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Multiple row formula |
| Parameter: Formula | MIN(HeatTime) |
| Parameter: Group rows by | Racer |
| Parameter: New column name | 'BestTime' |

| | |
|-----------------------------------|----------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Multiple row formula |
| Parameter: Formula | AVERAGE(HeatTime) |
| Parameter: Group rows by | Racer |
| Parameter: New column name | 'AvgTime' |

| | |
|-----------------------------------|----------------------|
| Transformation Name | New formula |
| Parameter: Formula type | Multiple row formula |
| Parameter: Formula | MAX(HeatTime) |
| Parameter: Group rows by | Racer |
| Parameter: New column name | 'WorstTime' |

8. To make the data look better, you might want to reformat the values in the `AvgTime` column to two decimal points:

| | |
|----------------------------|--------------------------|
| Transformation Name | Edit column with formula |
| Parameter: Columns | AvgTime |

| | |
|---------------------------|-----------------------------|
| Parameter: Formula | NUMFORMAT(AvgTime, '##.00') |
|---------------------------|-----------------------------|

Results:

After you use the Move transformation to re-organize your columns, the dataset should look like the following:

| Racer | HeatNum | HeatTime | BestTime | WorstTime | AvgTime |
|---------|---------|----------|----------|-----------|---------|
| Racer X | Heat1 | 37.22 | 37.22 | 38.22 | 37.68 |
| Racer X | Heat2 | 38.22 | 37.22 | 38.22 | 37.68 |
| Racer X | Heat3 | 37.61 | 37.22 | 38.22 | 37.68 |
| Racer Y | Heat1 | 41.33 | 38.04 | 41.33 | 39.69 |
| Racer Y | Heat3 | 38.04 | 38.04 | 41.33 | 39.69 |
| Racer Z | Heat1 | 39.27 | 38.85 | 39.27 | 39.05 |
| Racer Z | Heat2 | 39.04 | 38.85 | 39.27 | 39.05 |
| Racer Z | Heat3 | 38.85 | 38.85 | 39.27 | 39.05 |