

Efficient AI with Rust Lab
Rapid Time Series Datasets Library
RWTH Aachen University
Group 1

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Marius's Part

Downsampling I

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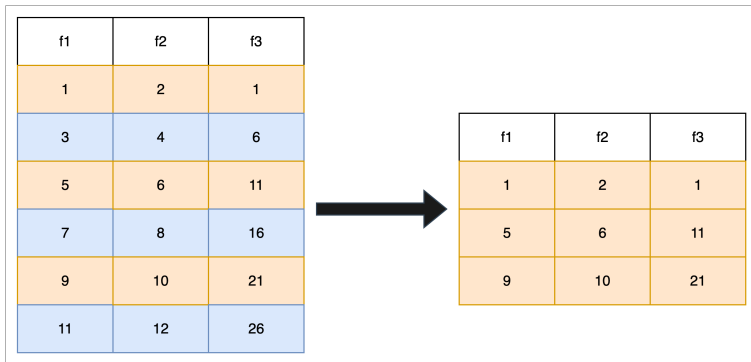
Necessary parameter when downsampling:

- ▶ Downsampling factor: How many data points to skip

Example:

- ▶ Downsampling factor of 2: Every second data point is kept as shown in Figure 1

Downsampling II



Downsampling example with a factor of 2

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Bottleneck of passing the data by reference:

- ▶ Not possible. A copy is needed.
- ▶ Creating view only possible on contiguous data.
- ▶ Downsampling does not yield a contiguous data structure.

Splitting I

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Splitting II (Random Split - Classification Data)

How it works:

1. Validate the proportions of train, validation, and test sets.

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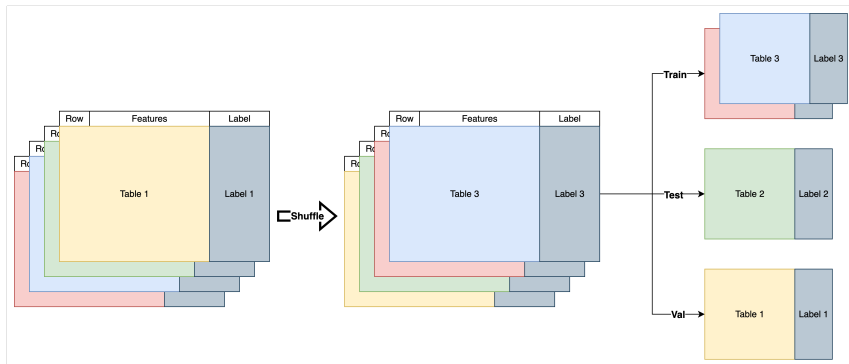
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3. Compute the split offsets based on the proportions.
4. Split the instances into three sets.

Splitting II (Random Split - Classification Data)

How it works:

1. Validate the proportions of train, validation, and test sets.
2. Shuffle the dataset randomly.
3. Compute the split offsets based on the proportions.
4. Split the instances into three sets.
5. Return the three sets as separate datasets.

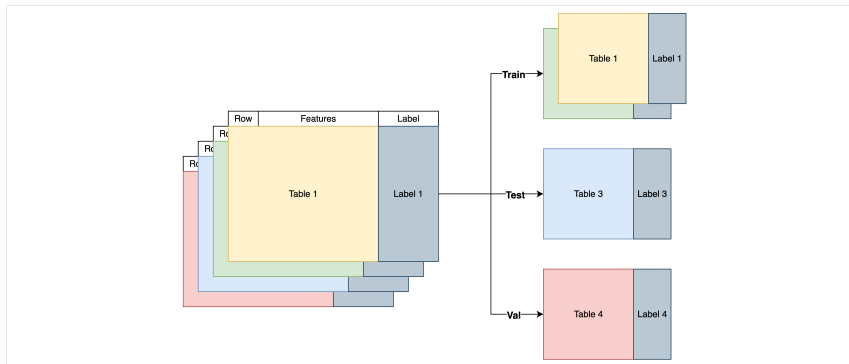
Splitting III (Random Split - Classification Data)



Random split example

Splitting IV (In-Order Split - Classification Data)

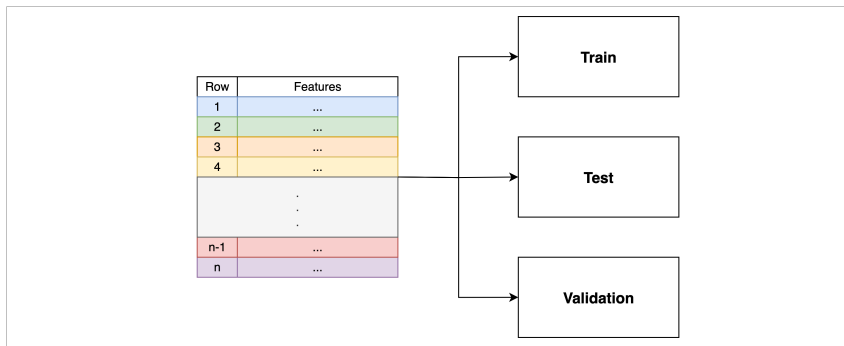
Works very similar to the random split, but it **doesn't shuffle** the dataset anymore.



In-Order split example

Splitting V (Temporal Split - Forecasting Data)

Similar to the in-order split, but this time we are dealing with forecasting data, which in most cases is only one instance and we split over **timesteps** and not instances anymore.



Temporal split example

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- ▶ Compute the mean and standard deviation for each feature column in the dataset.
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$$x' = \frac{x - \text{mean}}{\text{std}} \quad (1)$$

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- ▶ Apply the same mean and standard deviation to the validation and test sets.

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- ▶ Through a for-loop iterate over each feature and apply the min-max normalization formula:

$$x' = \frac{x - \min}{\max - \min} \quad (2)$$

- ▶ Apply the same min and max to the validation and test sets.

Kilian's Part