Agenda

- What is Standardization?
- What is Normalization?
- Standardization vs Normalization
- Practical

What is Standardization?

- **Standardisation** rescale the feature such as mean(μ) = 0 and standard deviation (σ) = 1.
- The result of standardisation is Z called as Z-score normalization.
- If data follow normal distribution (gaussian distribution).
- If the original distribution is normal, then the standardised distribution will be normal.
- If the original distribution is skewed, then the standardised distribution of the variable will also be skewed.

$$z = \frac{x - \mu}{\sigma}$$

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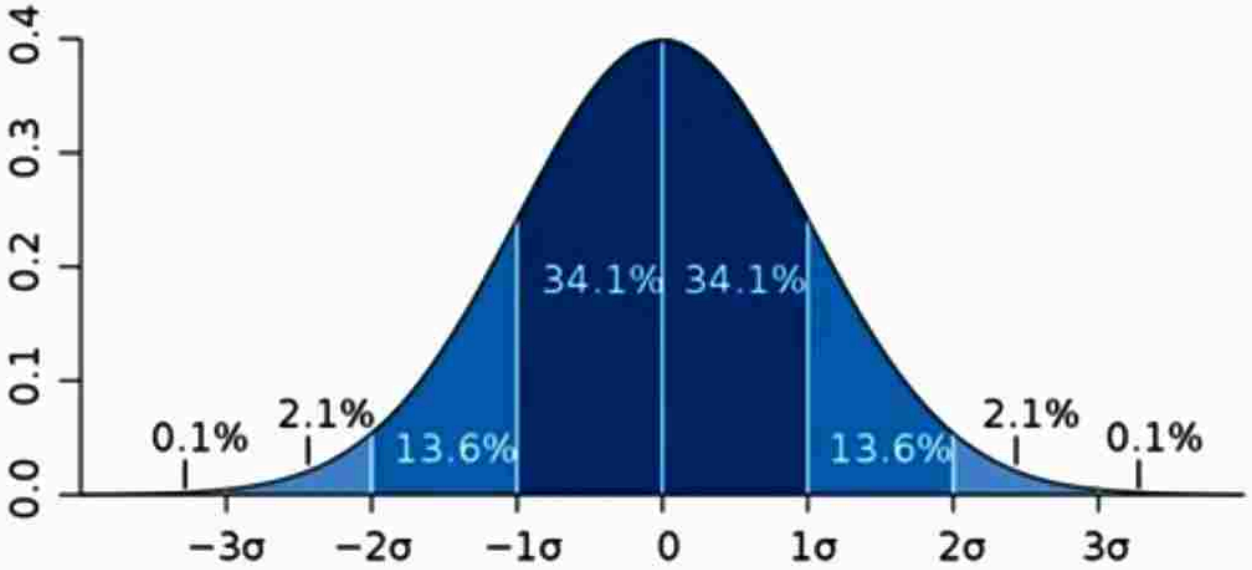
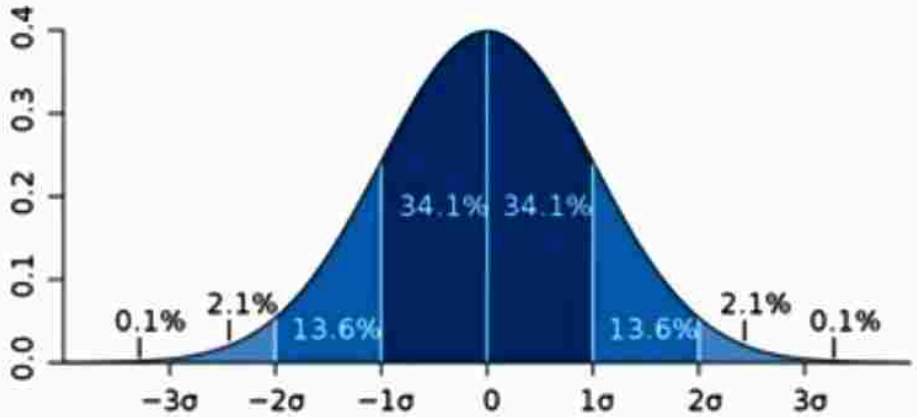


What is Normalization?

- **Normalization** rescale the feature in fixed range between 0 to 1.
- **Normalization** also called as **Min-Max Scaling**.
- If data doesn't follow normal distribution (Gaussian distribution).

$$X_{norm} = \frac{X - X_{min}}{X_{max} - X_{min}}$$



Standardization vs Normalization?

- There is no any thumb rule to use Standardization or Normalization for special ML algo.
- But mostly Standardization use for clustering analyses, Principal Component Analysis(PCA).
- Normalization prefer for Image processing because pixel intensity between 0 to 255, neural network algorithm require data in scale 0-1, K-Nearest Neighbors.

Types of Feature Scaling