

Standard Normal Distribution

$$X \sim N(\mu, \sigma)$$

\Downarrow

$$Y \sim \text{SND}(\mu=0, \sigma=1)$$

$$Z = \frac{x_i - \mu}{\sigma}$$

eg: $\{1, 2, 3, 4, 5\}$
 $\mu = 3$ $\sigma = 1$

\Rightarrow Z score ($\mu=0, \sigma=1$)

$$Z = \frac{x_i - \mu}{\sigma} = \frac{(1-3)}{1} = -2$$

$$\frac{2-3}{1} = -1$$

$$\frac{4-3}{1} = 1$$

$$\frac{3-3}{1} = 0$$

$$\frac{5-3}{1} = 2$$

$$\{-2, -1, 0, 1, 2\} \text{ SND } (\mu=0, \sigma=1)$$

$$\{1, 2, 3, 4, 5\}$$

$$[10 \text{ to } 1] \checkmark$$

Dataset

\Rightarrow Machine Learning

\Downarrow

Same Scale

<u>Age</u> (years)	<u>Weight</u> (kg)	<u>Distance</u> (km)
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24	100	100
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25	120	200
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26	75	500
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27	80	600
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μ, σ	μ, σ	μ, σ
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Z score

\Downarrow
Same Scale

$$\overline{\overline{\quad}} \rightarrow \boxed{\mu=0, \nu=1} \rightarrow \text{SND}$$