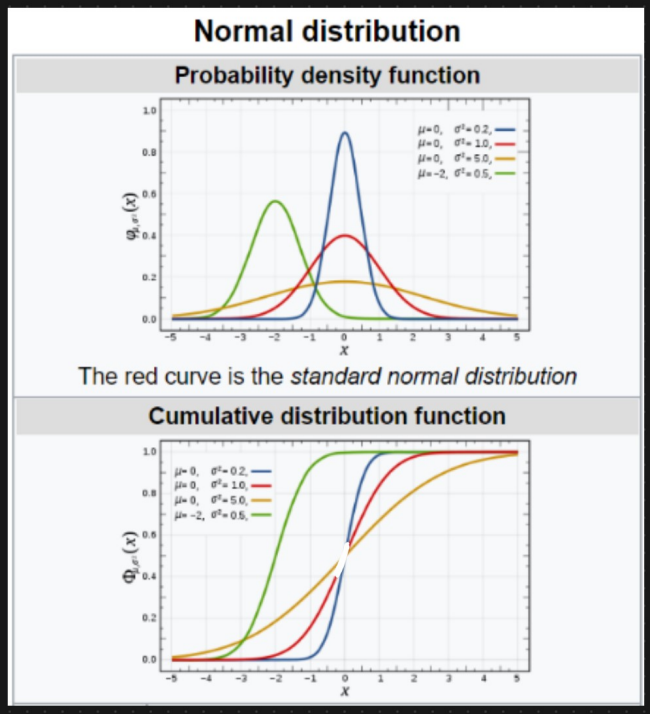
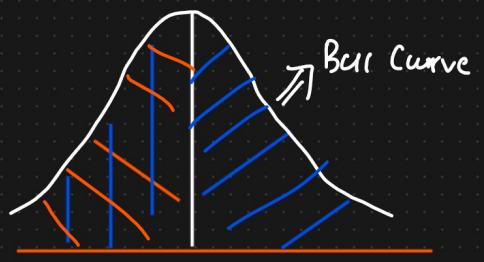
Normal / Gaussian Distribution (pdf)

In statistics, a normal distribution or Gaussian distribution is a type of continuous probability distribution for a real-valued random variable.





μ = median = mode

Notation $N(\mu, \sigma^2)$

Parameters : $\mu \in R$ = mean

$\sigma^2 \in R > 0$ = variance

$x \in R$

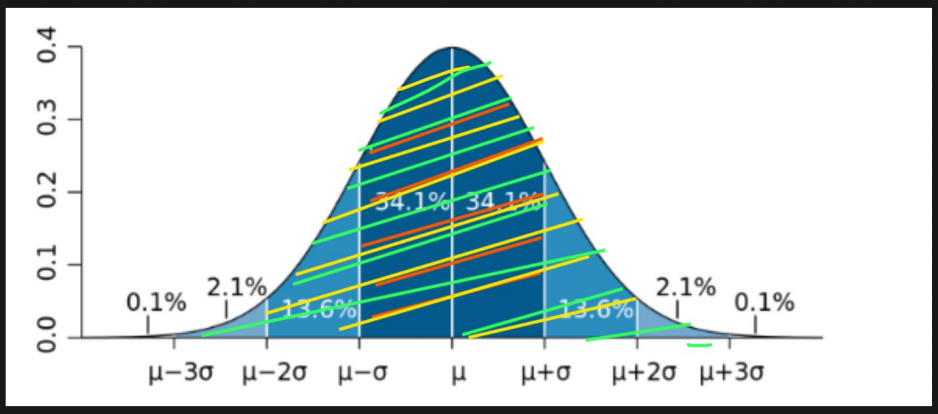
$$\text{PDF} = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x_i - \mu}{\sigma}\right)^2}$$

Mean of Normal Distribution

Mean = μ = Average

Variance & Std $\quad Var = \sigma^2 \quad \sigma = \sqrt{Var}$

Empirical Rule of Normal Distribution



68-95-99.7%

100

$X : \{$ $\}$

Probability

$$Pr(\mu - \sigma \leq X \leq \mu + \sigma) \approx 68\%$$

$$Pr(\mu - 2\sigma \leq X \leq \mu + 2\sigma) \approx 95\%$$

$$Pr(\mu - 3\sigma \leq X \leq \mu + 3\sigma) \approx 99.7\%$$

Examples : ① Weight of the student in the class

② Height of the " " "

③ IRIS DATASET {Sepal width}

Q-Q plot { Quantile Quantile Plot }