Introduction to statistical concepts (Part III)

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Normal Distribution

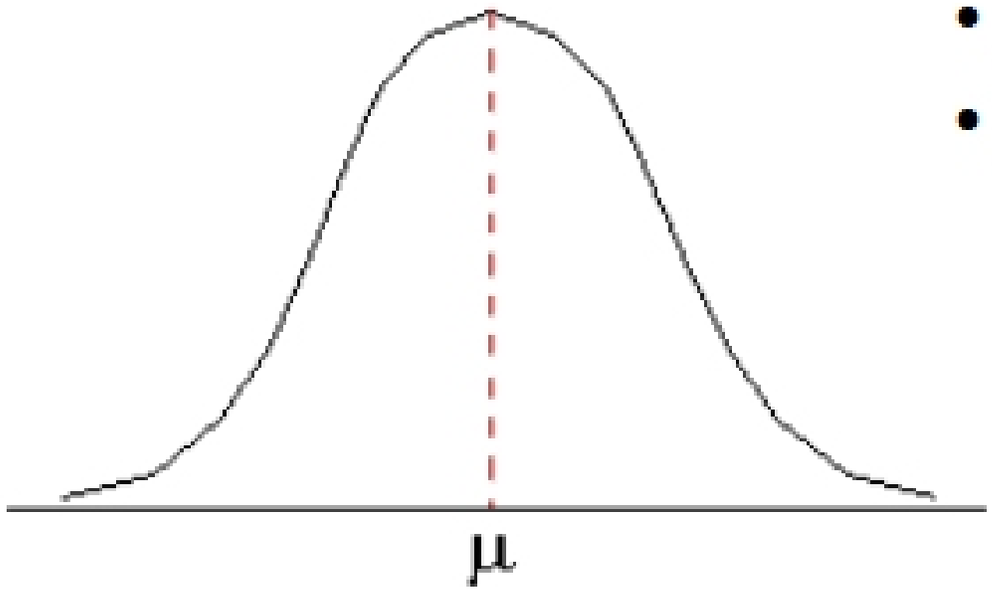
- The normal distribution (also known as Gaussian distribution) with parameters μ and σ, $N(\mu,\sigma)$, is the continuous probability distribution with the following probability density function:

$$f_X(x;\mu,\sigma) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}, -\infty < x < \infty \quad \text{(Eq. 1)}$$

  Where $\pi = 3.14159\ldots$, $e = 2.71828\ldots$

- Normal distribution is the cornerstone of the field of statistical inference
- Many distributions can be well approximated by the normal distribution
  - e.g. weight, height, bolt diameter, resistance of wire, construction error, etc.

Normal Distribution



Graph of the Probability Dense Function of Normal Distribution

- A bell curve, symmetric about $X = \mu$
- Shape of the curve is determined by σ
  - the larger σ is, the flatter the curve is