The Normal Distribution

Computing the Z Score

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The Normal Distribution

Key Parameters of the Normal Distribution

- Normal Mean μ
  (pronounced "mu")
- Normal Standard Deviation σ
  (pronounced "sigma")

The Normal Distribution

- Suppose we are interested in a normally distributed variable called X (for example: Heights or Weights).
- We are given specific values for
  - Normal Mean μ
  - Normal Standard Deviation σ

The Normal Distribution

- For some particular value x_o of the normal distribution X, there is a corresponding ***z-score*** z_o.
- The z-score is the distance, in terms of standard deviations, that x_o is from the mean μ.

$$z_o = \frac{x_o - \mu}{\sigma}$$

The Normal Distribution

X = Weights

- Mean of X: $\mu = 1000$ kg
- Standard Deviation of X : $\sigma = 20$ kg

Compute the z-score for 1050 kgs and 985 kgs

The Normal Distribution : Exercise 1

$$z_o = \frac{x_o - \mu}{\sigma}$$

$(x_o = 1050 \text{ kgs}, \mu = 1000 \text{ kgs}, \sigma = 20 \text{ kgs})$

The Normal Distribution : Exercise 2

$$z_o = \frac{x_o - \mu}{\sigma}$$

$(x_o = 985 \text{ kgs}, \mu = 1000 \text{ kgs}, \sigma = 20 \text{ kgs})$

Computing the Z-score

The normal distribution has the following paramters

- μ the mean of the normal distribution
- σ the standard deviation of the distribution

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

Suppose μ =1000 $\sigma = 400$

$$X \sim N(1000, 400)$$