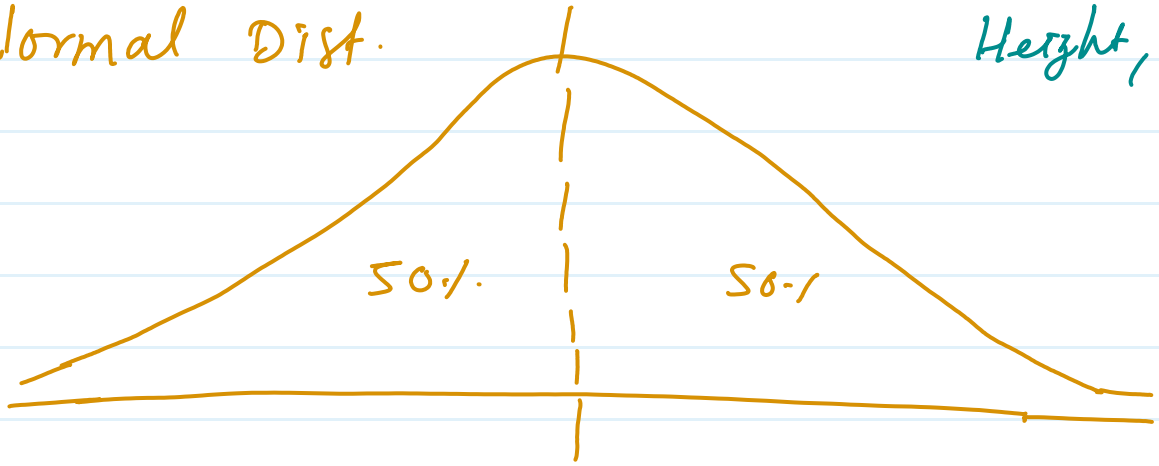
# ✡ Measure of Shap

(I) Normal Dist.

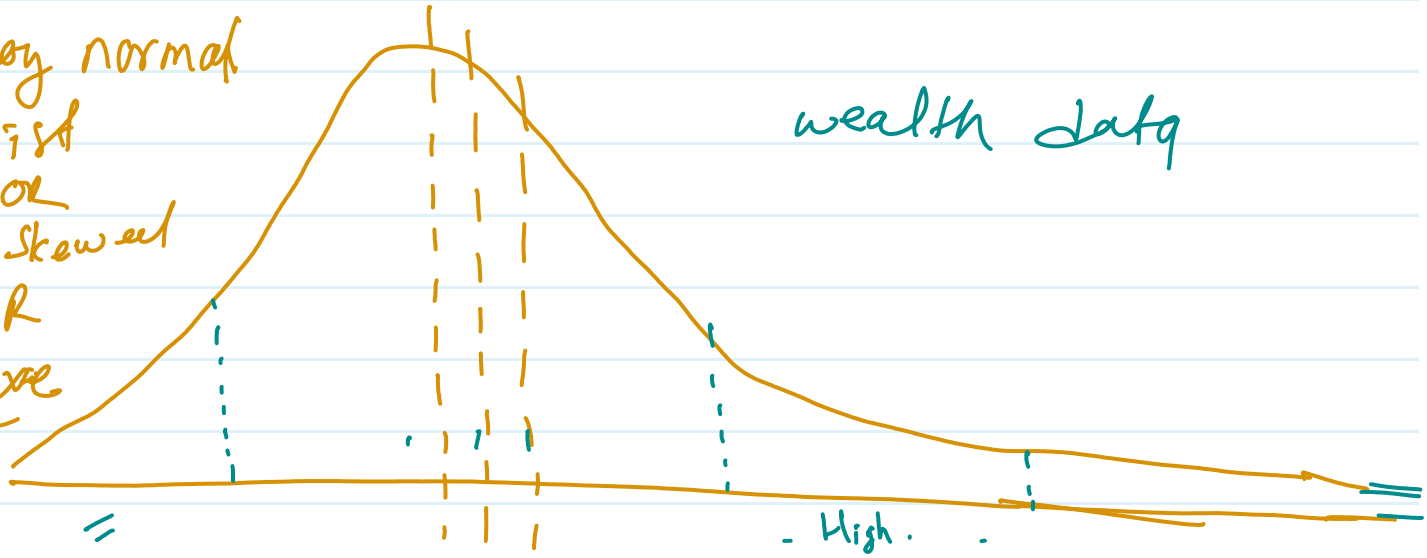
Height, weight




Symmetric

(II) Log normal Dist OR Right skewed OR Positive Dist

wealth data

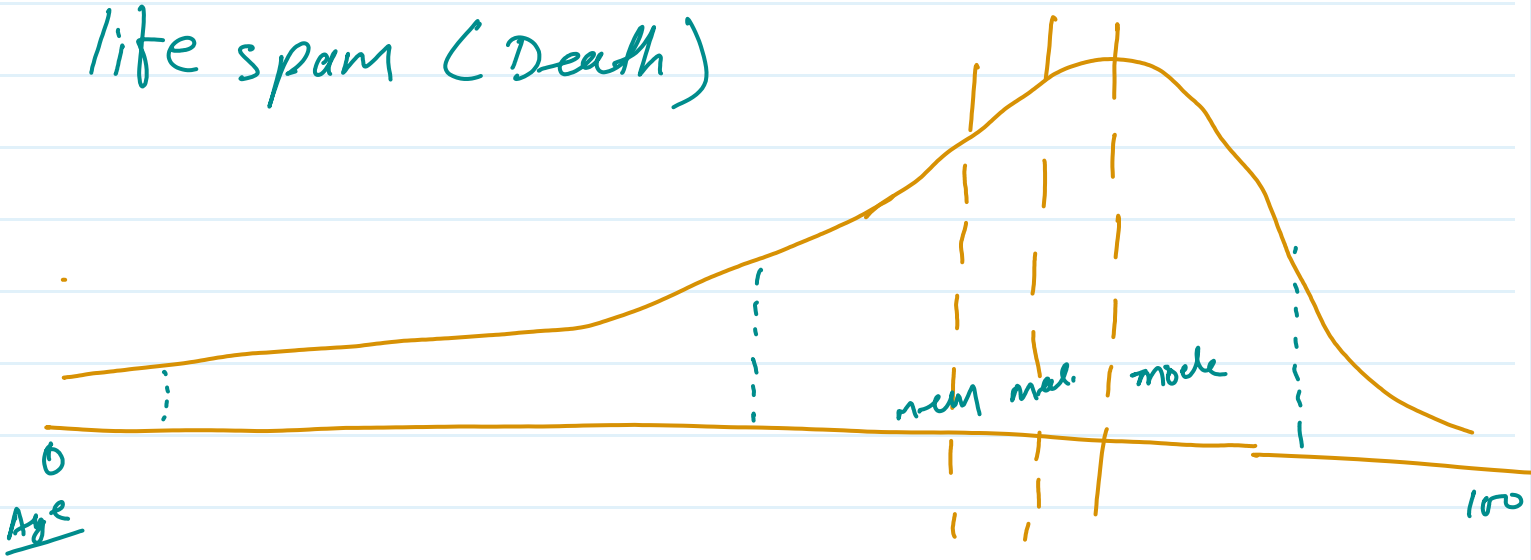



Asymmetric

mean > median > mode

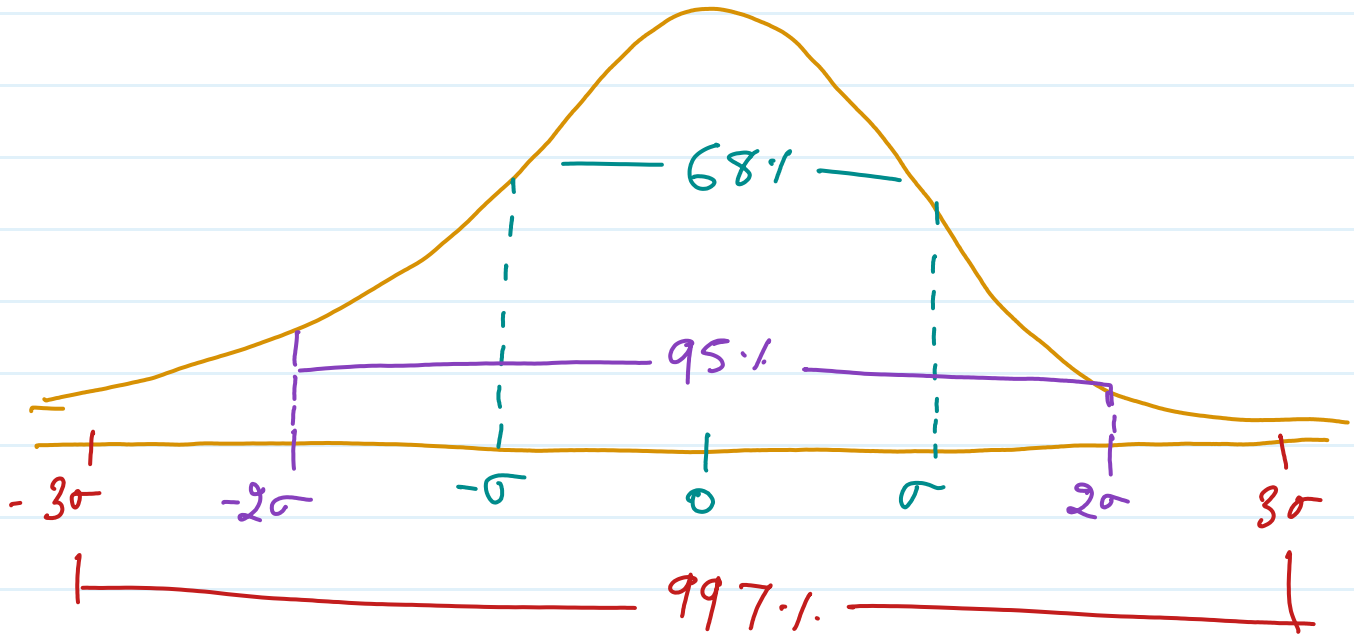
(III) Left skewed Dist or Negative Dist

life span (Death)




Mean < median < mode

# Emperical Rule of Distribution



# 68 - 95 - 99.7

## ✱ kurtosis

$K = 3$


If $k = 3$

(i) Mesokurtosis

If $k > 3$

(ii) Leptokurtosis

If $k < 3$

(iii) Platykurtosis

# Chebinhev's Inequality

$X \approx$ Gaussian Dist

$Pr_1(\mu - \sigma \leq x \leq \mu + \sigma) = 68\%$

$Pr_2(\mu - 2\sigma \leq x \leq \mu + 2\sigma) = 95\%$

$Pr_3(\mu - 3\sigma \leq x \leq \mu + 3\sigma) = 99.7\%$

$Y \not\approx$ Gaussian Dist.

$P_r(\mu - k\sigma \leq y \leq \mu + k\sigma) \geq 1 - \frac{1}{k^2}$

k is S.D., value of k will be 2 or more than two.

If $k = 2$

$P_r(\mu - 2\sigma \leq y \leq \mu + 2\sigma) \geq 1 - \frac{1}{2^2}$

$$\geq 1 - \frac{1}{4}$$

$$\geq \frac{3}{4} \Rightarrow 0.75$$

$$\Rightarrow 75\%.$$

If $k = 3$

$$P_r(\mu - 3\sigma \leq Y \leq \mu + 3\sigma) \geq 1 - \frac{1}{3^2}$$

$$\geq \frac{8}{9} = 88.9\%.$$

If $k = 4$

$$P_r(\mu - 4\sigma \leq Y \leq \mu + 4\sigma) \geq 1 - \frac{1}{4^2}$$

$$\geq \frac{15}{16} = 93\%.$$