

$$X_1 \sim N(\mu_1, \sigma_1^2), \dots, X_n \sim N(\mu_n, \sigma_n^2) \implies \\ X_1 + \dots + X_n \sim N(\mu_1 + \dots + \mu_n, \sigma_1^2 + \dots + \sigma_n^2)$$

$$X \sim \text{Bin}(n, p), Y \sim \text{Bin}(m, p) \implies X + Y \sim \text{Bin}(n + m, p)$$

$$X \sim \text{Po}(\lambda_1), Y \sim \text{Po}(\lambda_2) \implies X + Y \sim \text{Po}(\lambda_1 + \lambda_2)$$

We can approximate the binomial distribution with the normal distribution.

$$X \sim \text{Bin}(26, 0.4)$$

$$E[X] = 26 * 0.4 = 10.4, \text{Var}(X) = 26 * 0.4 * 0.6 = 6.24$$

$$\hat{X} \sim \mathcal{N}(10.4, 6.24)$$