Equation numbering

Test equation numbering

1

Try referencing Equation 1 before it's stated.

$$Y_i = \beta_0 + \beta_1 \text{Year}_i + \epsilon_i \quad \text{where} \quad \epsilon_i \sim \text{N}(0, \sigma^2). \tag{1}$$

Now please refer back to Equation 1.

2

Next, we try referring to (2):

$$\begin{aligned} \text{Lik}(p_B) &= p_B^6 (1 - p_B)^7 p_B^{10} \cdots \\ &= p_B^{30} (1 - p_B)^{20} \end{aligned} \tag{2}$$

Try other equations from the first edition Rmds. These make reference to (3), (4), (5), (6), and (7).

3

$$\begin{aligned} \text{lik}(p_B) &= P(GBB)P(GGG) \\ &= [(1 - p_B)p_B^2][(1 - p_B)^3] \\ &= (1 - p_B)^4 p_B^2 \end{aligned}$$

4

$$\text{lik}(p_B) = p_B^{30}(1 - p_B)^{20}$$
$$\log(\text{lik}(p_B)) = 30\log(p_B) + 20\log(1 - p_B)$$
$$\frac{d}{dp_B}\log(\text{lik}(p_B)) = \frac{30}{p_B} - \frac{20}{1 - p_B} = 0 \tag{3}$$

5

$$Y_{22j} = a_{22} + b_{22}\text{LargeEns}_{22j} + \epsilon_{22j} \text{ where } \epsilon_{22j} \sim N(0, \sigma^2) \text{ and} \tag{4}$$

$$\text{LargeEns}_j = \begin{cases} 1 & \text{if perf-type} = \text{Large Ensemble} \\ 0 & \text{if perf-type} = \text{Solo or Small Ensemble} \end{cases}$$

6

$$a_i = \alpha_0 + \alpha_1\text{Orch}_i + u_i \tag{5}$$
$$b_i = \beta_0 + \beta_1\text{Orch}_i + v_i \tag{6}$$

7

$$\hat{a}_i = 16.3 + 1.4\text{Orch}_i + u_i \tag{7}$$
$$\hat{b}_i = -0.8 - 1.4\text{Orch}_i + v_i$$

8

$$\begin{bmatrix} u_i \\ v_i \end{bmatrix} \sim N\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} \sigma_u^2 & \rho_{uv}\sigma_u\sigma_v \\ \rho_{uv}\sigma_u\sigma_v & \sigma_v^2 \end{bmatrix}\right)$$