

STAT 511 : Final Exam:  
Additional Formulas

Multinomial Probability Function:

$$P(y_1, y_2, \dots, y_k) = \frac{n!}{y_1! y_2! \dots y_k!} p_1^{y_1} p_2^{y_2} \dots p_k^{y_k}$$

---

If  $(Y_1, Y_2)$  bivariate normal:

$$Y_1 | Y_2 = y_2 \sim N \left[ \mu_1 + \rho \left( \frac{\sigma_1}{\sigma_2} \right) (y_2 - \mu_2), \sigma_1^2 (1 - \rho^2) \right]$$

$$Y_2 | Y_1 = y_1 \sim N \left[ \mu_2 + \rho \left( \frac{\sigma_2}{\sigma_1} \right) (y_1 - \mu_1), \sigma_2^2 (1 - \rho^2) \right]$$