Summary

- Measures of variability can help one to create a mental picture of the spread of the data
- Sometimes a population variance σ^2 is the primary objective in an experimental investigation
- If the assumptions are met, $(s_1^2 / \sigma_1^2)/(s_2^2 / \sigma_2^2)$ follows a distribution known as the *F distribution* with *two* values used for degrees of freedom
- A confidence interval for the ratio of variances gives an estimated range of values, which is likely to include a ratio of unknown population variances, the estimated range being calculated from a given set of sample data
- The confidence level is the probability value (1-α) associated with a confidence interval which is often expressed as a percentage
- 100 (1- α) % C.I for the ratio of variances of two populations with known means as μ_1 and μ_2 is given by

  $$\left[\frac{n\sum_{i=1}^{m}(x_i-\mu_1)^2}{Bm\sum_{i=1}^{n}(y_i-\mu_2)^2} \;,\; \frac{n\sum_{i=1}^{m}(x_i-\mu_1)^2}{Am\sum_{i=1}^{n}(y_i-\mu_2)^2} \right]$$

  Where, B= $F_{\alpha/2}(m,n)$ and A= $F_{(1-\alpha/2)}(m,n)$

- 100 (1- α) % C.I for the ratio of variances of two populations with unknown means is given by

  $$\left[\frac{s_1^2}{Bs_2^2} \,,\, \frac{s_1^2}{As_2^2} \right]$$

  Where, B= $F_{\alpha/2}(m-1,n-1)$ and A= $F_{(1-\alpha/2)}(m-1,n-1)$