Summary

- Sample observations may have the same centre but look different because of the way the numbers spread out from the centre
- 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
- The standardized statistic for variance is called chi-square, which is equal to $(n-1) s^2 / \sigma^2$ is called a Chi- square variable and has a sampling distribution called the Chi-square probability distribution with n-1 degrees of freedom

- A confidence interval for variance gives an estimated range of values, which is likely to include an unknown population variance, the estimated range being calculated from a given set of sample data
- The confidence level is the probability value $(1- \alpha)$ associated with a confidence interval which is often expressed as a percentage

- $100 (1- \alpha)$ % C.I for the population variance σ^2 when the mean is known as μ is given by

  - $[\sum(y_i-\mu)^2 / B , \sum(y_i-\mu)^2 / A]$ where B= $\chi^2_{\alpha/2}(n)$ and A= $\chi^2_{(1-\alpha/2)}(n)$

- $100 (1- \alpha)$ % C.I for the population variance σ^2 when the mean is unknown is given by
  - $[\sum(y_i- \bar{y})2 / B , \sum(y_i- \bar{y})2 / A]$ where B= $\chi^2_{\alpha/2}(n-1)$ and A= $\chi^2_{(1-\alpha/2)}(n-1)$