References – Statistical Inference for One Population

The proofs of the concepts listed below that I have referred to in this module, can be found in several mathematical statistics text books. In particular:

1) For the following, refer to
   Mood, A.M., Graybill, F.A., Boes, D.C. (1974) *Introduction to the Theory of Statistics, 3rd Edition*, McGraw-Hill, Kogakusha, Ltd. Tokyo

   $E(s^2) = \sigma^2 \Longrightarrow$ the sample variance is an unbiased estimator of the population variance
   Chapter VI, Section 2.2

   Central limit theorem
   Chapter VI, Section 3.3

   $\chi^2 = \frac{(n-1)s^2}{\sigma^2}$ follows a chi-square distribution with *n* -1 degrees of freedom, χ^2_{n-1}.
   Chapter VI, Section 4.3

   $t = \frac{\bar{X} - \mu}{\frac{s}{\sqrt{n}}}$ follows a *t*-distribution with *n*-1 degrees of freedom, t_{n-1}.
   Chapter VI, Section 4.5

   For sufficiently large n, $Z = \frac{p - \pi}{\sqrt{\frac{\pi\,(1-\pi)}{n}}}$ follows standard normal distribution, *N*(0,1).
   Chapter III, Section 4.1

2) For the following,
   As $n \Longrightarrow \infty$ $\sqrt{2\chi^2}$ follows a normal distribution with mean $\sqrt{2(n-1)}$ and variance 1.

   Refer to
   Stuart, A., Ord, K., (1994) *Kendall's Advance Theory of Statistics, Volume 1, Distribution Theory, 6th edition*, Hodder Arnold, London.
   Chapter 16, Sections 16.2 - 16.6.

3) Using (2) above to determine an approximate sample size to estimate the population variance, refer to

   Thompson Jr., W.A., Endriss, J. (1961) The required sample size when estimating variances. The American Statistician, 15:3, 22-23.