

SUPPLEMENTARY TUTORIAL 03

IT 1070 (June Intake)

- 1) Suppose that we have a random sample of heights of 40 UK adults who are older than 25 years old. The researcher is interested in determining whether the mean height of the adults is equal to 154cm. The population standard deviation is 10cm. The random sample indicated that the sample mean, is 160cm.
 - a) At the 0.05 level of significance, is there evidence that the mean height is different from 154cm?
 - b) Compute the p-value and interpret its meaning.
 - c) Construct a 95% confidence interval estimate of the population mean height of the UK adults.
 - d) Compare the results of (a) and (c). What conclusions do you reach?
- 2) Published results suggest that qualified hospital administrators have a salary normally distributed with a mean (μ) = \$85,100, and standard deviation (σ) = \$10,000.

Salaries for a random sample of 20 such hospital administrators show a mean value \bar{x} = \$80,900.

- a) Set up the null and alternative hypotheses to test the investigator's claim of mean salary is equal to \$85,000.
 - b) Calculate the test statistic to be used.
 - c) Determine whether this result shows that the publisher's claim can be accepted at 5% level of significance.
- 3) Suppose that we have a random sample of size $n = 40$ from a normal distribution whose mean, μ has an unknown value but the variance, $\sigma^2 = 25.0$. From these data it has been calculated that the sample mean, $\bar{x} = 29.63$.

Show that there is no significant evidence at the 5% level to reject $H_0 : \mu = 30.0$ in favour of the alternative $H_1 : \mu < 30.0$.