

Exercise 4

- 1- An insurance company believes that the average claim for car accidents last year was £500. A sample of 64 claims has shown an average of £450 with a standard deviation of £144 in the past year.
 - a) Investigate whether the insurance company's claim is true at the 5% significant level.
 - b) For the above problem, investigate whether the average accident claims was less than £500, assuming a 10% level of significance.

- 2- A real estate agent claims that the average rental price for a one bedroom flat in the West End area (London) is £300 per week. A sample of 20 flats for rent has revealed an average of £340 with a standard deviation of £100.
 - a) Investigate whether the claim of the state agent is true at the 1% level of significant.
 - b) Investigate whether the rental price for a one bedroom flat in the West End is greater than £300 per week, assuming a 10% significance level.

- 3- A publishing company aims to test the claim that there is a difference between two overnight delivery companies in their material delivered. The average speed of material delivered over a 30-day period is shown below. At $\alpha=0.01$, is there enough evidence to support the claim that there is a difference between the delivery times of the two company.

Company 1	Company 2
$\bar{X}_1 = 16$ hours	$\bar{X}_2 = 18$ hours
$s_1 = 3.2$ hours	$s_2 = 3.0$ hours
$n_1=30$	$n_2=30$

- 4- A real state agent compares the selling prices of houses in two suburbs of London; namely Hampstead and Richmond, to see whether there is a significance difference in price. The results of the survey are shown below. Is there evidence to reject the claim that the average cost of a house in both locations is the same at the 5% level of significance?

Hampstead	Richmond
$\bar{X}_1 = \text{£}300,000$	$\bar{X}_2 = \text{£}285,000$
$s_1 = \text{£}10,000$	$s_2 = \text{£}15,000$
$n_1=35$	$n_2=40$

- 5- Monthly data for the past five years (60 observation) indicate that standard deviations of monthly returns on FTSE100 and FTSE250 indices are 0.0116 and 0.0138, respectively,
- Investigate whether there is a significant difference between the two volatilities.
 - It is also found that the coefficient of Skewness for the returns on each index (FTSE100 and FTSE250) are 0.52 and 0.75 respectively. Investigate whether the distribution of returns on each index is significantly skewed.
 - Using the sample in the previous example, it is found that the coefficient of Kurtosis for the returns on each index (FTSE100 and FTSE250) are 4.52 and 4.75 respectively. Investigate whether the distribution of returns on each index shows excess kurtosis.
 - Using the above information, test whether the distributions of returns on indices are normal.