

**BCO105 / CMQ101 – SEMESTER 2 2014**  
**ASSIGNMENT 2 – WEIGHTING 25%**  
**DUE 0900 MONDAY 22 SEPTEMBER 2014**

**ASSIGNMENT INSTRUCTIONS:**

1. Provide written answers to all five questions, submitted as a Word document. Do not submit hand-written answers.
2. Ensure that a completed cover sheet is attached to the front of the assignment. A blank cover sheet accompanies the assignment questions.
3. Assignment answer scripts are to be submitted using the submission link in Learnline. Do not email answer scripts.
4. Excel spreadsheets should not be used for answers, but can be submitted as attachments if used for any calculations. Excel attachments will not be marked.
5. Each question is worth 15 marks, for an assignment total of 75 marks. Grades will be posted as a score out of 75 in the Grade Centre.
6. Grade Centre scores will be adjusted at the end of semester to reflect the actual weighting of the assignment (25%).
7. Show all reasoning for decisions made, formulas used and calculations done in the written answers. Most marks are awarded for demonstration of correct decision making in relation to appropriate techniques, and correct interpretations of results obtained from application of these techniques.
8. Please be aware of the CDU rules governing plagiarism and collusion. While students are encouraged to discuss the questions among themselves, the final submitted assignment must be the student's own work. Any answer that is a clear copy of another's work will score zero.
9. Late penalties will apply to assignments submitted after the nominated deadline, unless an extension approval has been given in writing by the Head of School of Business and Accounting before the deadline.
10. Late penalties are at the rate of 5% (5 marks per 100) per day late. Any assignment submitted more than 14 days after the deadline will not be marked.
11. Applications for extension need to satisfy the extension policy guidelines, and should be forwarded to the Head of School of Business. Please see assessment area for further instructions. The unit lecturer cannot approve extensions.
12. The unit lecturer cannot provide specific guidance on individual assignment questions, but can answer general questions regarding the application of statistical techniques.

## ASSIGNMENT QUESTIONS:

### Question 1:

The quality control manager at a light globe factory needs to estimate the mean life of a large shipment of energy-saving compact light globes. The historical standard deviation of light globe life is 250 hours. A random sample of 64 light globes indicates a sample mean life of 7,940 hours.

(a) Construct a 95% confidence interval estimate of the population mean life of light globes in this shipment.

(b) Do you think that the manufacturer has the right to state that the light globes last an average of 8,000 hours? Explain.

(c) Must you assume that the population of light globe life is normally distributed? Explain.

(d) Suppose that the standard deviation changes to 180 hours. What are your amended answers in parts (a) and (b)?

### Question 2:

Using the company records for the past 500 working days, the manager of a car dealership has summarised the number of cars sold per day in the following table:

| Number of cars sold per day | Frequency of occurrence |
|-----------------------------|-------------------------|
| 0                           | 40                      |
| 1                           | 100                     |
| 2                           | 142                     |
| 3                           | 66                      |
| 4                           | 36                      |
| 5                           | 30                      |
| 6                           | 26                      |
| 7                           | 20                      |
| 8                           | 16                      |
| 9                           | 14                      |
| 10                          | 8                       |
| 11                          | 2                       |

(a) Form the probability distribution for the number of cars sold per day.

(b) Calculate the mean or expected number of cars sold per day.

(c) Calculate the standard deviation of the number of cars sold per day.

**Question 3:**

A company is having a new corporate website developed. In the final testing phase the download time to open the new home page is recorded for a large number of computers in office and home settings. The mean download time for the site is 2.5 seconds. Suppose that the download times for the site are normally distributed with a standard deviation of 0.5 seconds. If you select a random sample of 30 download times:

- (a) What is the probability that the sample mean time is less than 2.75 seconds?
- (b) What is the probability that the sample mean time is between 2.70 and 2.90 seconds?
- (c) The probability is 80% that the sample mean time is between what two values symmetrically distributed around the population mean?
- (d) The probability is 95% that the sample mean time is less than what value?

**Question 4:**

The number of shares traded each day on the Australian Stock Exchange (ASX) is referred to as the volume of trade. During the 2007/08 financial year the average volume traded daily for the ASX All Ordinaries was 935 million with a standard deviation of 262 million.

Assume that the number of All Ordinaries shares traded daily on the ASX is a normal random variable with a mean of 935 million and a standard deviation of 262 million. For a randomly selected day, what is the probability that the volume of trading in these shares is:

- (a) Below 500 million?
- (b) Between 750 and 1,000 million?
- (c) Below 1,500 million?
- (d) Above 1,200 million?
- (e) On 18 September 2008 the All Ordinaries volume of trade was 2,125 million. What is the probability that the volume of trading for the All Ordinaries on a randomly selected day is at least 2,125 million? What conclusions can you draw from this probability?

**Question 5:**

An education study gives information on the study mode (full-time or part-time) of students studying for a post-school qualification as well as their employment status. This information is summarised in the following table, expressed in percentages (%) of students enrolled in post-school education:

| Employment status  | Studying full-time | Studying part-time |
|--------------------|--------------------|--------------------|
| Employed full-time | 6.4                | 37.7               |
| Employed part-time | 18.1               | 12.2               |
| Not employed       | 17.4               | 8.2                |

- (a) Suppose that you select a full-time student. What is the probability that they are not employed?
- (b) Suppose that you know that a student is employed full-time. What is the probability that they are studying full-time?
- (c) Are the two events, 'employed full-time' and 'studying full-time', statistically independent? Explain.
- (d) What is the probability that a part-time student is in full-time employment?
- (e) What is the probability that a part-time student is not in full-time employment?