



**BUS105e
Statistics**

Assignment 2 – Group-based Assignment

January 2017 Presentation

Group-based Assignment

This assignment is worth 30% of the final mark for BUS105e Statistics.

The cut-off date for this assignment is **1 Mar 2017, 2355hrs.**

This is a group-based assignment. You should form a group of **3 members** from your seminar group. Each group is required to upload a single report to Canvas via your respective seminar group. Please elect a group leader. The responsibility of the group leader is to upload the report on behalf of the group.

It is important for each group member to contribute substantially to the final submitted work. All group members are equally responsible for the entire submitted assignment. If you feel that the work distribution is inequitable to either yourself or your group mates, please highlight this to your instructor as soon as possible. Your instructor will then investigate and decide on any action that needs to be taken. It is not necessary for all group members to be awarded the same mark.

Important Note: Grading of TMA/GBA/ECA Submissions

Marks awarded to your assignment are based on the following guidelines:

1. 80% of the marks are allocated to the content of your answers:

- The marks awarded to *what your answers cover* depend on the extent to which they cover the key points that correctly and comprehensively address each question.
- The key points should be supported by evidence drawn from course materials and, wherever relevant, from other credible sources.

2. 20% of the marks are allocated to the presentation of your answers:

Wherever applicable, the marks awarded to *how your answers are presented* depend on the extent to which your answers:

- form a sound reasoning by developing those key points in a clear, logical and succinct manner;
- provide proper and adequate in-text citations and referencing to content drawn from course materials and other credible sources;
- strictly follow APA formatting and style guidelines¹, in particular for:
 - in-text citations and end-of-report references;
 - the identification of figures and tables;
- use, wherever relevant, the specialised vocabulary and terminology commonly used in discussions about the topic(s) covered by each question;
- provide a reference or bibliography at the end of the main report;
- include the less relevant details in an Appendix;
- use sentence constructions that are grammatically and syntactically correct;
- are free from spelling mistakes; present the workings, numerical formulations and results in a logical manner that follows the APA formatting and style guidelines;
- design and present graphs, diagrams and plots that follow the APA formatting and style guidelines;
- are highly original;
- have proper formatting, which may:
 - include a properly formatted cover page;
 - respect the answer length/word count set out in the assignment guidelines, if any is prescribed;
 - present answers in paragraphs with proper spacing and page margins;
 - include page numbers and appendices, if necessary.

¹ You can find a short tutorial on the APA formatting and style guidelines here: <https://is.gd/mgEOnC>. Additional details (pertaining to tables and figures) can be found here: <https://is.gd/O4vDdT>.

Airline On-time Arrival Performance

ABC Airlines is an airline company operating in the Asia Pacific region. Recently, Mr. Tan has been appointed the operations manager who looks into the on-time arrival of air lines between Singapore and China. He retrieved monthly on-time arrival performance records for the period 2000-2015 for two randomly chosen lines. One is flying from Singapore to China and the other is flying from China to Singapore. Mr. Tan engaged you as a consultant to analyse the on-time arrival performance data and examine whether flights from Singapore to China have a better on-time arrival performance than flights from China to Singapore.

You are provided with the monthly record of the on-time arrival rates for two randomly chosen flights flying between Singapore and China for the year 2000-2015. Please use the Excel software and the data file “Airline_Arrival_Time_Data_for_Students.xlsx” to answer the following questions:

Question 1

Compare the on-time arrival rate of the two lines flying between China and Singapore. Use descriptive statistics to describe the on-time arrival rate of the two lines. Identify the measures of location and dispersion. Interpret your preliminary observations.

(15 marks)

Question 2

- (a) State and interpret 95% confidence intervals for the on-time arrival rate of the two lines. (4 marks)
- (b) State and interpret 99% confidence intervals for the on-time arrival rate of the two lines. (4 marks)
- (c) Briefly describe the key assumption(s) you have made in constructing confidence intervals. Discuss if this/these assumption(s) is/are reasonable. (4 marks)
- (d) Interpret and explain why the 99% and 95% confidence intervals are different. (4 marks)
- (e) With the confidence intervals, state whether or not you can conclude that the on-time arrival rates of the two lines are different. (4 marks)

Question 3

Select an appropriate test of hypothesis to determine if the mean on-time arrival rate is different between the two lines.

You should include the following:

- (a) State the null and alternative hypotheses and explain how you develop these two hypotheses. (5 marks)
- (b) Execute the hypothesis testing with $\alpha = 0.05$ using Excel. Present and list the test statistic you use for this test. Explain your decision criteria. (15 marks)
- (c) Discuss the assumptions you have made in performing the test. Are these assumptions reasonable? Please provide explanations. (10 marks)

Question 4

- (a) If you have a free hand on the project starting from sampling to analysis, how would you conduct the project analysis and what recommendations would you give for the problem in question? Please keep your answer within 500 words (indicate your word count). (20 marks)
- (b) Provide an executive summary of your analysis and findings to Mr. Tan within 300 words (indicate your word count). (15 marks)

---- END OF ASSIGNMENT ----