

Elementary Statistics

Assignment 3 Question Paper

Guideline

- Prepare A4 sized papers or single-lined papers as answer sheets. You may use more than one page.
- Write down your name, student ID, subject name, class code, and lecturer name on page 1 of your answer sheets.
- Your solution must be **handwritten on papers**. Electronic file created from iPad / tablet device is not accepted. Typed solution will not be marked.
- Scan your finished assignment as a single **pdf file** (no other file format is accepted). The file should be named as “Student Name_ES_A3.pdf”, e.g. “Chan Tai Man_ES_A3pdf”
- Submit your pdf document to SOUL Class link before **26 November (Friday) 23:59**.
Mark deduction will be applied for late submission as follow:
Submission on 27 November (Saturday): -20%
Submission on 28 November (Sunday): -50%
NO MORE Submission on or after 29 November (Monday) (0 marks)
- **Make sure you check your submitted file:**
 - i. your writing is clear
 - ii. all pages are included
 - iii. the file can be opened properly**File cannot be opened / read will be scored 0 marks**
- It is an individual assignment. Keep your original hardcopy for checking.
- There are several mobile apps for scanning document to pdf file. You may try CamScanner / OfficeLens / ...
- For any question, please contact your class lecturer.

Full marks: 30 marks

Show your calculation steps clearly.

Correct your answer to 4 decimal places and report the measurement unit when applicable.

Question 1 (10 marks)

Ronaldo is a football player. Below is his own description about his previous matches:

“In one Champions League match, I can score at most 4 goals. The chance to have one goal in a match is four times of having no goal at all. The chance of scoring a brace (two goals) is half of scoring exactly one goal. I am a goal machine. The chance of scoring a hat-trick (three goals) is the same as scoring zero goal in a match. However, it is very rare to have four goals, which is just one-third of the likelihood of scoring a hat-trick.”

- (a) Present the probability distribution of X in a table, where X is the number of goals Ronaldo will score in one Champions League match.
- (b) Calculate the average number of goals he will score in one Champions League match.
- (c) Ronaldo takes part in a regular fundraising program. He is donating €2000 for each Champions League match. Moreover, if he scores, he will donate € M for each goal. If he sets a target to donate an average of €3000 in one match. Find the value of M (round off to the integer).

Question 2 (20 marks)

The waiting time for receiving an occupational therapy treatment in a rehabilitation clinic after arrival is normally distributed with mean 15 minutes and standard deviation 3.5 minutes.

- (a) What is the probability that the waiting time for a randomly selected patient from that clinic is more than 16 minutes?
- (b) There are 7% of the patients need to wait for more than k minutes, find the value of k .
- (c) Suppose there are 8 patients, what is the probability that less than 3 of them need to wait for more than 16 minutes to receive the treatment? Assume their waiting times are independent to each other.
- (d) Suppose the occupational therapy treatment time in the clinic is normally distributed with mean 30 minutes and standard deviation 5 minutes, which is independent to the waiting time. Find the following summary statistics of the total time a patient spends in the clinic:
 - (di) Mean
 - (dii) standard deviation
 - (diii) Mode