Labwork3:
Parameter Estimation

Exercise 1: Using the z-score table to find the number $z_{\alpha/2}$ needed to estimate a confidence interval:

- When the level of confidence is 85%
- When the level of confidence is 97%

Exercise 2: Using the t-distribution table to find the number $z_{\alpha/2}$ needed to estimate a confidence interval:

- When the level of confidence is 85%
- When the level of confidence is 97%

Exercise 3: Calculate the sample size, sample mean and sample standard deviation of the variable "tbc" in the dataset "SinhVienCaoDang.xlsx". Then based on the calculated values, construct a 90% confidence interval for the population mean. Explain the meaning of the result.

Exercise 4: A sample of 16 students from a big school gives a mean GPA 2.84 with sample standard deviation 0.48. Based on the values, construct a 90% confidence interval for the mean GPA of all students in the school. Assume that GPA has a normal distribution.

Exercise 5: Calculate the sample size, the number of female students in the dataset "SinhVienCaoDang.xlsx". Then based on the calculated values, construct a 95% confidence interval for the proportion of all female students in the school.

Exercise 6: Given a margin of error E = 0.25, find a minimum sample size n in order to construct a 98% confidence interval for the population mean μ with the assumption that the population standard deviation $\sigma = 1.35$.

Exercise 7: Given 90% confidence interval, the yearly income of Hanoi people with at least 3 years of experience to within $2000. It is estimated that the income range is no more than $32,000. Hence, the population standard deviation is estimated to be about $8000. From the given information, find the necessary minimum sample size n.

Exercise 8: Given a margin of error E = 0.26, find a minimum sample size n in order to construct a 95% confidence interval for the population proportion *p*:

- Assume that no prior knowledge of p is known in advance
- Assume that prior knowledge from previous studies suggest that p is about 0.15

Note:

- The labwork will be required to submit to either google classroom or google drive folder to the course (will be informed later).