Problem Set 1 - Point and Interval Estimation and Testing

ECO 204 - Statistics for Business and Economics - II
Summer 2025

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Due Date: 5th July, 10:00 PM, 2025

Instructions : Please form a group of three (max) and submit on Google Classroom by the due date.

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Point and Interval Estimation

1. Suppose we would like to understand the **spending behavior of the students at the Economics Dept. at EWU**. With this in mind, we randomly asked 64 students about how much they spent for lunch yesterday, the data is given below:

Student	Amount	Student	Amount	Student	Amount	Student	Amount
1	20.50	17	18.89	33	25.53	49	11.85
2	14.63	18	19.88	34	27.71	50	17.88
3	23.77	19	23.11	35	33.81	51	6.83
4	29.96	20	20.11	36	21.79	52	30.99
5	29.49	21	20.34	37	19.16	53	14.62
6	32.70	22	20.08	38	26.35	54	18.38
7	9.20	23	30.36	39	20.01	55	26.85
8	20.89	24	21.79	40	26.85	56	25.10
9	28.87	25	21.18	41	13.63	57	27.55
10	15.78	26	19.22	42	17.22	58	25.87
11	18.16	27	34.13	43	13.17	59	14.37
12	12.16	28	27.49	44	20.12	60	15.61
13	11.22	29	36.55	45	22.11	61	26.46
14	16.43	30	18.37	46	22.47	62	24.24
15	17.66	31	32.27	47	20.36	63	16.66
16	9.59	32	12.63	48	35.47	64	20.85

The first column is the student serial and the second column is the amount spent in TK. Now answer following questions.

(a) What is the population of this study?

(b) If the target parameter is the **mean amount spent for lunch, let's say this is** μ (note this is the population mean), in theory how would you calculate the population mean?

(c) What is the sample size in this case?

(d) What is the point estimate of the population mean μ?

(e) If we know the amount spent on lunch is distributed normally with a population standard deviation of $\sigma = 6$, what is the standard error of the sample mean? At 95% confidence, construct a interval estimate for the population mean μ.

(f) If we do not know the population standard deviation, assuming normality how would you construct the interval estimate for the population mean μ?

(g) Finally if we don't know anything about the population distribution, how would you construct the interval estimate for the population mean μ?

(h) Can you construct an interval if we don't know about the population distribution but the sample size is only 10.

Note: If you want you can use the data file `Student_Lunch.xlsx`, where the Amounts are recorded in an Excel file.

Remarks: Most of the problems are taken from Anderson et al. (2020). If possible you should do more problems from Anderson et al. (2020) and Newbold et al. (2022).

References:

Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., Cochran, J. J., Fry, M. J. and Ohlmann, J. W. (2020), *Statistics for Business & Economics*, 14th edn, Cengage, Boston, MA.

Newbold, P., Carlson, W. L. and Thorne, B. M. (2022), *Statistics for Business and Economics*, 10th, global edn, Pearson, Harlow, England.