DS 623 PE10

In this assignment, you will implement a **one-tailed t-test** by using the Python script.

Please use the following textbook for the concepts and formula of each statistic.

- Levine, D. M. & Stephan, D. F. (2023). *Even You Can Learn Statistics and Analytics: An Easy to Understand Guide* (4th ed.). Addison-Wesley Professional. https://learning.oreilly.com/library/view/even-you-can/9780137654789/

Requirement

- Input File:

It should read an input file called “input.txt”.
In the file, there are two sets of information. The first one is the confidence level (or significance level) in the first line. The second one is the actual data in the rest of the document, i.e., the list of “n” numbers.

- Output:

Using the input file, the code should provide the following information:

- Sample Mean ($\bar{x}$): See section 3.1
- Sample Standard Deviation (s): See section 3.1
- Degrees of freedom: See section 6.3
- t-statistic: See section 6.3
- p value: See section 6.3
- Confidence Interval: See section 6.3
- Critical value (x value that corresponds to the confidence level): See section 6.3

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You can refer to Chapter 2 and 3 of the following textbook for concepts. The book uses R, but you can learn major concepts from this resource.

Chapter 2:

- Random Sampling and Sample Bias
- Selection Bias
- Sampling Distribution of a Statistic
- Confidence Intervals
- Student's t-Distribution

Chapter 3:

- Hypothesis Tests
- Statistical Significance and p-values
- t-Tests

Bruce, P., Bruce, A., & Gedeck, P. (2020). *Practical Statistics for Data Scientists* (2nd)., O'Reilly Media

https://learning.oreilly.com/library/view/practical-statistics-for/9781492072935/