**Middle East Technical University**

**Department of Statistics**

**Spring 2020-2021**

**STAT 250 THE GUIDELINES OF THE TERM PROJECT**

The framework for a study on the term project as a guide for analyzing data. The term project must be cover that at least the following steps in detail:

1. Define the target population.

2. Divide this population into subgroups depending on any characteristics.

3. Select at least 8 samples from each subgroup randomly. Explain your sampling method, discuss the advantages of sampling methods.

4. Observe some characteristics of the sampling units. eg: Descriptive statistics

5. Estimate some parameters of the population.

6. Discuss the properties of your estimators.

7. Construct some interval estimation for the parameters and explain the result.

8. Compare that the results of point and interval estimations.

9. Test some claims about parameters of population by using one-sided and two-sided significance test methods. Use both the nonparametric and the parametric significance test methods and compare the results of both methods.

10. Test the differences between some parameters of the subgroups.

11. Show some example for the paired analysis by using your statistical data

(If there is paired data in your dataset, please apply paired analysis. If not, do not need to implement paired analysis)

12. Discuss / calculate the type 1 error and type 2 error in your significance tests.

13. Find the p-values in your significance tests.

14. Graph the power of the test.

15. Find the critical values for some statistics such as in your significance tests.

16. State the assumptions you made before the tests of significance.

17. Construct a one-way ANOVA model and test the treatment effects.

18. Find the best simple linear regression line between two different variables in your data.

19. Test and in linear regression.

20. Find a 90% Confidence Interval for and in linear regression.

21. Find a 99% Confidence Interval for the mean of given .

22. Find the correlation coefficient and determination of coefficient and explain the meaning of them.

23. Compare the results of the correlation and regression analysis.

24. State your conclusion (The results of your analysis).

25. Comment on this term project.