

The staff of a service center for electrical appliances include three technicians who specialize in repairing three widely used electrical appliances by three different manufacturers. It was desired to study the effects of Technician and Manufacturer on the service time. Each technician was randomly assigned five repair jobs on each manufacturer's appliance and the time to complete each job (in minutes) was recorded. The data for this particular experiment is thus attached. Questions:

- 1) State the Null and Alternate Hypothesis for conducting one-way ANOVA for both the variables 'Manufacturer' and 'Technician' individually. – **3 points**
- 2) Perform one-way ANOVA for variable 'Manufacturer' with respect to the variable 'Service Time'. State whether the Null Hypothesis is accepted or rejected based on the ANOVA results. - **3 points**
- 3) Perform one-way ANOVA for variable 'Technician' with respect to the variable 'Service Time'. State whether the Null Hypothesis is accepted or rejected based on the ANOVA results. - **3 points**
- 4) Analyse the effects of one variable on another with the help of an interaction plot. What is an interaction between two treatments?
[hint: use the 'pointplot' function from the 'seaborn' graphical subroutine in Python] - **4 points**
- 5) Perform a two-way ANOVA based on the variables 'Manufacturer' & 'Technician' with respect to the variable 'Service Time' and state your results. - **5 points**
- 6) Mention the business implications of performing ANOVA for this particular case study. - **5 points**