Unitec Institute of Technology
TE WHARE WĀNANGA O WAIRAKA

School of Computing & Information Technology

ISCG8026 Introduction to Data Science

Semester 1 – 2020

Lab Exercise 3

Due Date: 2 May 2020, 13:00

Weight: 5%

Instructions

For this set of lab exercises, you will be working in groups of 2-3 people. It is worth 5% of your final grade and it must be submitted individually on Moodle by 13.00 on Saturday 2 May 2020.

- **Dataset**: Electric power consumption, available for download on Moodle
- **Description**: Measurements of electric power consumption in one household with a one-minute sampling rate over a period of almost 4 years. Different electrical quantities and some sub- metering values are available.

The following descriptions of the 9 variables in the dataset are taken from the UCI web site:

1. **Date**: Date in format dd/mm/yyyy
2. **Time**: time in format hh:mm:ss
3. **Global_active_power**: household global minute-averaged active power (in kilowatt)
4. **Global_reactive_power**: household global minute-averaged reactive power (in kilowatt)
5. **Voltage**: minute-averaged voltage (in volt)
6. **Global_intensity**: household global minute-averaged current intensity (in ampere)
7. **Sub_metering_1**: energy sub-metering No. 1 (in watt-hour of active energy). It corresponds to the kitchen, containing mainly a dishwasher, an oven and a microwave (hot plates are not electric but gas powered).
8. **Sub_metering_2**: energy sub-metering No. 2 (in watt-hour of active energy). It corresponds to the laundry room, containing a washing-machine, a tumble-drier, a refrigerator and a light.
9. **Sub_metering_3**: energy sub-metering No. 3 (in watt-hour of active energy). It corresponds to an electric water-heater and an air-conditioner.

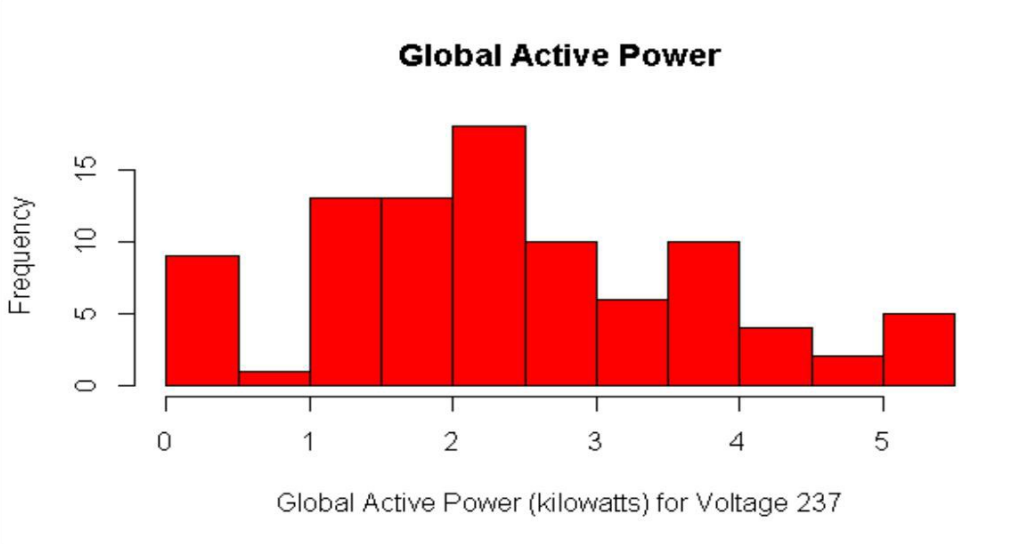
Making Plots

Load the dataset into R. Your task is to reconstruct the following plots below, all of which were constructed using the base plotting system.

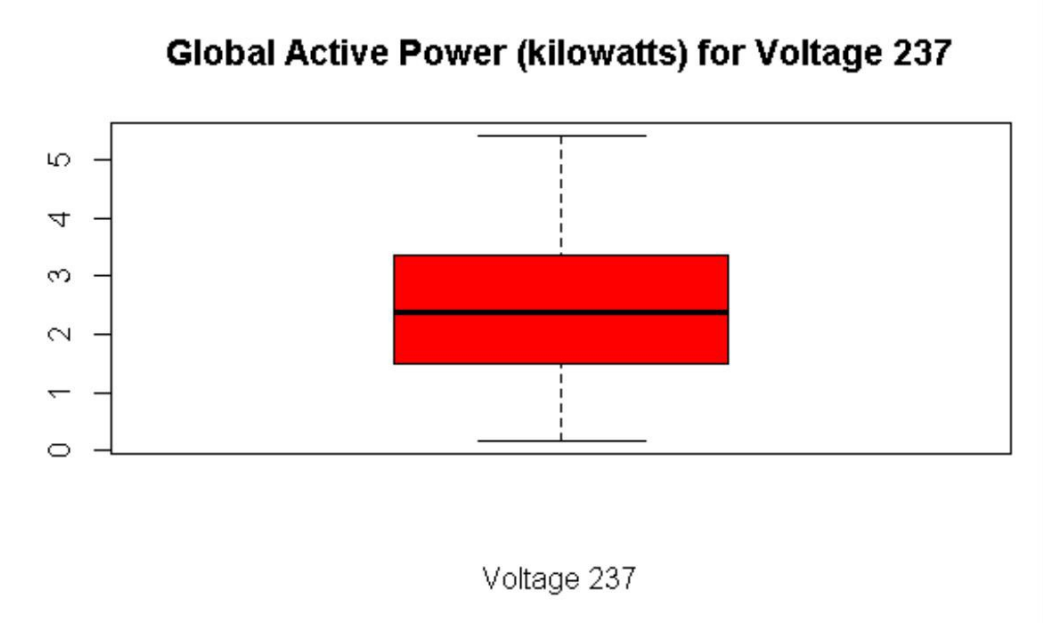
For each plot, you should:

- Construct the plot and *save it to a PNG file*.
- Name each of the plot files as plot1.png, plot2.png, etc.
- Create a separate R code file (plot1.R, plot2.R, etc.) that constructs the corresponding plot, i.e. code in plot1.R constructs the plot1.png plot. Your code file **should include code for reading the data** so that the plot can be fully reproduced. You must also include the code that creates the PNG file.
- Add the PNG files and R code files to a zip file and submit it online on Moodle.

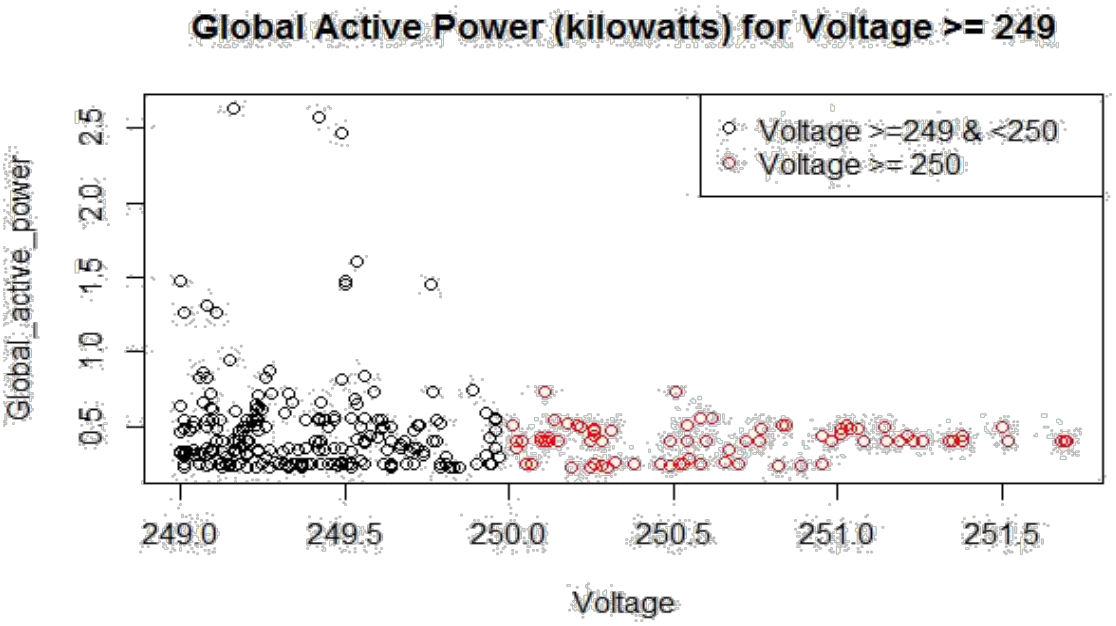
Plot 1 [1 Mark]



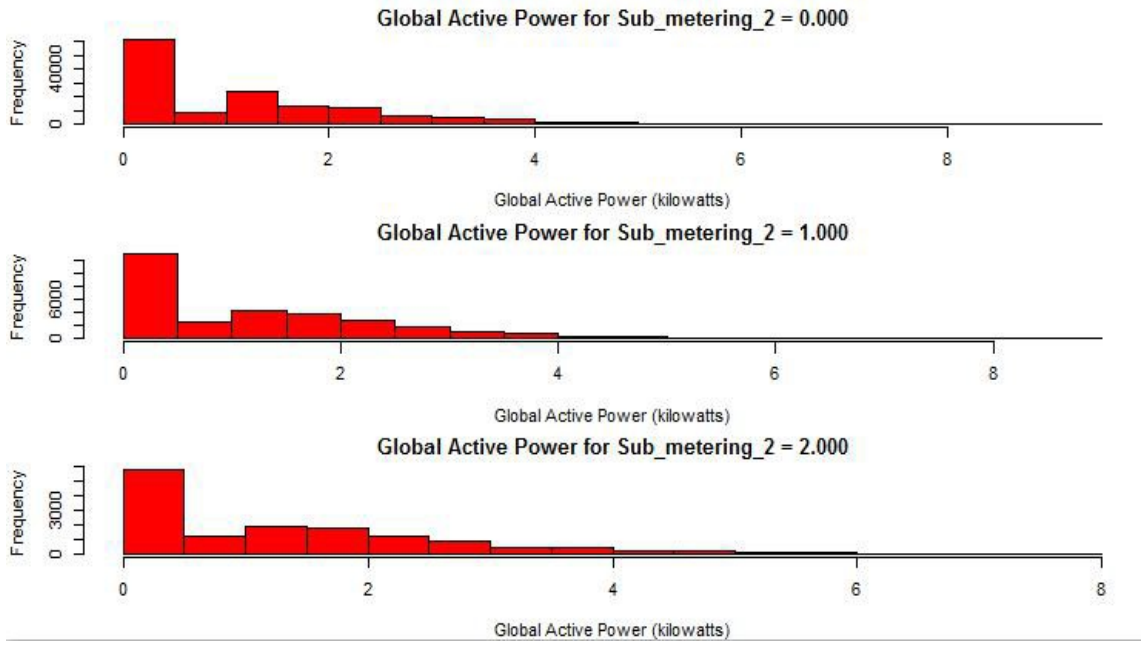
Plot 2 [1 Mark]



Plot 3 [1.5 Marks]



Plot 4 [1.5 Marks]



Late Submission of Assignments

Assignments submitted after the due date and time without having received an extension through Special Assessment Circumstances (SAC) will be penalised according to the following:

- 10% of marks deducted if submitted within 24hrs of the deadline
- 20% of marks deducted if submitted after 24hrs and up to 48hrs of the deadline
- No grade will be awarded for an assignment that is submitted later than 48hrs after the deadline

Assignments submitted in more than 48 hours late will not be marked unless Special Assessment Circumstances apply. So, it is better to submit an incomplete assignment on time.

Special Assessment Circumstances

A student, who due to circumstances beyond his or her control, misses a test, final exam or an assignment deadline or considers his or her performance in a test, final exam or an assignment to have been adversely affected, should complete the Special Assessment Circumstances (SAC) form available from Student Central. Within any semester, a student may have only one SAC per course. When requesting an SAC for an assignment, the SAC application form must be submitted (along with the work completed to date) within the time frame of the extension requested; i.e. if the Doctor's certificate is for one (1) day, then the SAC application form and work completed must be submitted within one (1) day.

Assistance to other Students

Students themselves can be an excellent resource to assist the learning of fellow students, but there are issues that arise in assessments that relate to the type and amount of assistance given by students to other students. It is important to recognise what types of assistance are beneficial to another's learning and also what types of assistance are unacceptable in an assessment.

Beneficial Assistance

- Study Groups.
- Discussion.
- Sharing reading material.
- Testing another student's programming work using the executable code and giving them the results of that testing.

Unacceptable Assistance

- Working together on one copy of the assessment and submitting it as own work.
- Giving another student your work.
- Copying someone else's work. This includes work done by someone not on the course.
- Changing or correcting another student's work.
- Copying from books, Internet etc. and submitting it as own work. Anything taken directly from another source must be acknowledged correctly: show the source alongside the quotation.

Do you want to do the best that you can do on this assignment and improve your grades? You could:

• Talk it over with your lecturer
• Visit Student Success and Achievement for learning advice and support (in Te Puna)
• Visit the Centre for Pacific Development and Support