

Statistics

Homework 1 (Due March 15, 2019)

1. Fifteen years of daily rainfalls observed at five weather stations in a region are given in the "raindata.csv" EXCEL file.
 - (1) Read the daily rainfall data using the `read.csv` command and calculate average monthly rainfalls of individual stations.
 - (2) On the same plot, show the time series of average monthly rainfalls of individual stations.
 - (3) Calculate and show time series plot of the regional-average monthly rainfalls.
 - (4) Identify the dry and wet seasons of the region.
2. In a certain city, 30% of the people are Conservatives, 50% are Liberals, and 20% are Independents. Records show that in a particular election, 65% of the Conservatives voted, 82 % of Liberals voted, and 50% of the Independents voted. If a person in the city is selected at random and it is learned that she did not vote in the last election, what is the probability that she is a Liberal?
3. The probabilities of numbers of typhoons hitting a city in one year are shown in the following table:

| | | | | | | |
|--------------------|------|------|------|------|------|------|
| Number of typhoons | 0 | 1 | 2 | 3 | 4 | 5 |
| Probability | 0.05 | 0.08 | 0.19 | 0.36 | 0.24 | 0.08 |

Assume that the probability of inundation for a typhoon event is 0.16.

- (1) What is the probability that the city will not be hit by any typhoon in the next three years?
 - (2) What is the probability that in the next three years the city will be hit four times with no inundation?
4. The EXCEL file "Myanmar_Monthly_Rain.csv" contains average monthly rainfalls at 54 rainfall stations in the Central Dry Zone (CDZ) of Myanmar.
 - (1) Plot a multiple-boxplot (same as shown in the class PPT file) of average monthly rainfalls in the CDZ.
 - (2) For July, identify the five number summary (5NS) using R.
 - (3) For July, calculate the five number summary (5NS) by yourself.
 - (4) For July, identify the values of outliers and upper and lower whiskers.