LaTeX Exercise for QBS Bootcamp 2020

Vala Zeinali[1,*]

[1]Dartmouth College, QBS, Hanover, 03748, United States
[*]vala.zeinali.gr@dartmouth.edu

ABSTRACT

Introduction - What I learned During QBS Bootcamp

- I learned how to use new packages in R.
- I learned how to access Dartmouth servers for computing.
- I learned how to predict Parkinson's disease.
- I learned about Hanover weather patterns!
- I learned how amazing the QBS team is.

Results

Data Analysis

	Fitbit	Fitbit2	Fitbit3	Fitbit4	Fitbit5	Fitbit6
Mean	4.414	8.965	6.409	7.731	4.597	3.773
Median	0	0	0	0	0	0
STD	18.974	24.542	22.437	24.244	18.730	15.882
Total Cal	1372.50	1842.44	1653.61	2360.47	1612.50	1215.06

Table 1. A Table of Fitbit Descriptive Statistics for Day 1 - 6

Methods

Law of Total Probability

Theorem:

$If b_1, b_2, b_3, ...$

is a partition of the sample space S, then for any event A we have

$$P(A) = \sum_i P(A \cap B_i) = \sum_i P(A|B_i) * P(B_i)$$

Since B1,B2,B3,... is a partition of the sample space S, then for any event A we have

$$S = \bigcup_i B_i$$

$$A = A \cap S \Rightarrow A \cap (\bigcup_i B_i) = \bigcup_i (A \cap B_i)$$

$Note that since B_i' s are disjoint, A \cap B_i are disjoint. Hence,$

$$P(A) = P(\bigcup_i (A \cap B_i)) = \sum_i P(A \cap B_i) = \sum_i P(A|B_i) * P(B_i))$$

References

1. Rice, J. A. Mathematical statistics and data analysis. (2006).

[1].

Discussion

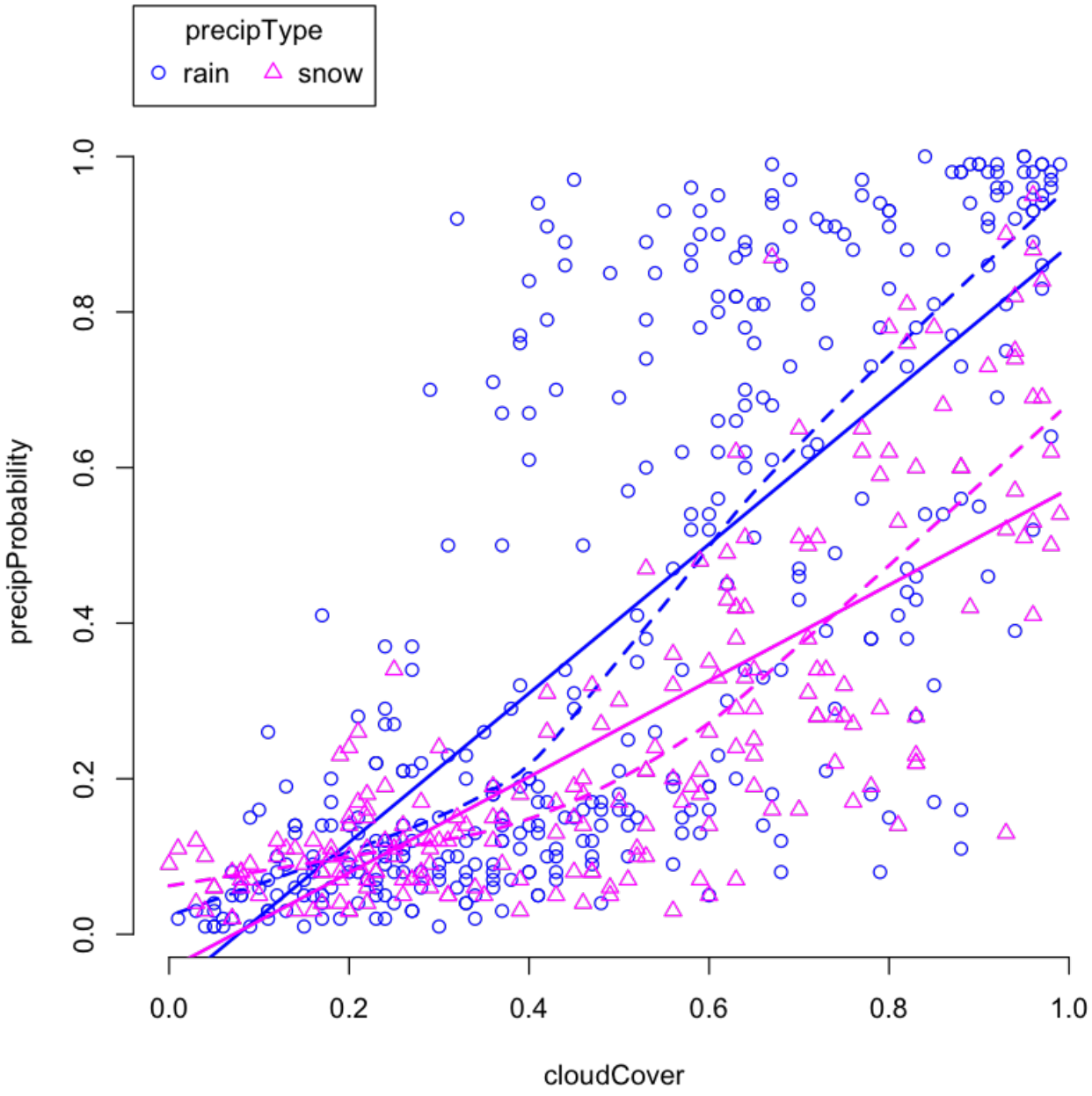

Figure 1. precipitation probability vs cloud coverage for rain and snow days.
I really liked doing the exploratory data analysis with the Hanover weather data. This is a figure I made that models the association between the chance of precipitation and cloud coverage for snowy v.s. rainy days. Looks like rain has a higher correlation!