STA201: Elements of Statistics and Probability

Assignment 2

Marks: 30

Question 1

A Benchmark company is testing Computer Power Supply Unit (PSU) of two different companies X and Y. PSUs were tested at the 120% stress to check for the overvoltage protection. The following data given in Table 1, represent time to failure (in hours) for random samples taken from the days' production of the companies.

Table 1: Failure time (in hours) of PSU of X and Y Company

Company	Failure time (in hours)									
X	0.54	1.80	4.52	2.05	1.03	1.18	0.80	1.33	1.29	1.11
	3.34	1.54	0.08	4.12	0.60	0.72	0.92	1.05	1.66	3.03
	1.81	2.17	0.63	0.56	5.03	0.09	0.18	0.34	1.51	1.45
Y	1.52	0.19	1.55	0.02	0.07	3.65	0.40	0.24	1.66	1.45
	1.60	1.80	4.69	0.08	7.89	1.58	0.64	0.03	0.23	0.72

a) What are the sample size of the company X & Y?

b) Compute the sample mean, variance, and standard deviation for the time to failure for company X.

c) Compute the sample mean, variance, and standard deviation for the time to failure for company Y.

d) Compute the Coefficient of variation for the time to failure for company X.

e) Compute the Coefficient of variation for the time to failure for company Y.

f) Which measure one should consider to compare the performance / consistency of the product of the two company? And why?

g) Which company's product is more consistent in their performance?

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Question 2

You are given the following data pertaining to kilowatt hours of electricity consumed by some users in the city of Khulna:

Table 2: Consumption of electricity by the users of Khulna city

Consumption (In Kilowatt hours)	Number of users
$20 \le X < 30$	13
$30 \le X < 40$	35
$40 \le X < 50$	25
$50 \le X < 60$	23
$60 \le X < 70$	0 + **X**

Where **X** is the sum of the **last two digits** of your BRAC University ID. For example: if your university ID is: 1812345**6** then **X** would be **5 + 6 = 11**. Estimate the following:

a) sample variance and the sample standard deviation
b) mean deviation
c) coefficient of variation.

Question 3

For a distribution Karl Pearson's coefficient of skewness is 0.64, Variance is 40 and mean is $(\sqrt{X+Y+Z})$. Find mode and median. [Here X, Y, Z = First 3 digits of you Student ID]