CIVL 4162/6162
Traffic Engineering
Assignment-3
Due: October 3, 2019 (Beginning of Class)

Question-1: The speed and corresponding frequency on an urban freeway is given in the Table 1.

Table 1 Speed and frequency recorded on an urban freeway

Speed	Frequency	Speed	Frequency	Speed	Frequency	Speed	Frequency
30	1	40	2	50	18	60	3
31	1	41	3	51	8	61	3
32	2	42	4	52	16	62	3
33	-	43	6	53	10	63	1
34	2	44	5	54	10	64	1
35	2	45	6	55	11	65	1
36	3	46	10	56	10	66	1
37	-	47	6	57	13	67	1
38	-	48	15	58	6	68	1
39	-	49	9	59	5	69	1

Find the following.

i. Average or time mean speed
ii. Standard deviation
iii. 85^{th} percentile speed
iv. Median
v. Pace
vi. Recommended speed limit.

Question-2: Test if the speed data follows normal distribution.

Question-3: Analyze the spot speed data collected in Lab 2 (Speed Studies) and comment on existing speed limit posted on test location based on your analysis.

For CIVL6162 only

Question-4 Consider the spot speed studies data collected under uncongested flow conditions at a rural highway (Table 2) and answer the questions (a) to (e):

(a) Plot frequency and cumulative frequency curves for the given data.

(b) Determine

i. Median speed
ii. Modal speed
iii. Pace

iv. Percentage of vehicles in the pact from curves

(c) Compute mean and standard deviation for the speed distribution

(d) What are the confidence bounds of the estimate of the true mean speed of the distribution with (i) 95% confidence (ii) 99.7% confidence?

(e) Based on the results of this study, a second study is to be conducted to achieve a tolerance of ±0.8 mi/h with 95% confidence. What sample size is required?

(f) Can this data be adequately described as normal?

Table 2 Speed and frequency recorded on a rural highway

Speed Group (mi/h)	Number of vehicles observed (N)
15-20	0
20-25	4
25-30	9
30-35	18
35-40	35
40-45	42
45-50	32
50-55	20
55-60	9
60-65	0