1. Define the followings:

   - Average Daily Traffic (ADT)
   - Annual Average Daily Traffic (AADT)

2. The total monthly volumes recorded at one permanent count station on a rural highway in 2012 are shown in the following table.

Month	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
No. of vehicles (thousands)	420	412	385	405	450	500	590	550	486	424	416	402

The sum of volumes of each specific day of the week in August are shown in the following table.

Day	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Total volume	90300	84000	79300	77100	72700	83100	63500

   a. Draw the daily volume fluctuations for the given week.
   b. Calculate the monthly average of daily traffic volumes.
   c. Draw the monthly volume variations.
   d. Calculate the AADT.
   e. Assuming a suitable value for the K-factor, how many lanes could accommodate the design hourly volume?

3. If the measured daily traffic volume on one urban arterial in Cairo for the two directions was 10,800 veh/day. The traffic composition of the counted volume is shown in the following table:

Vehicle Class	Percentage
Trucks	3%
Buses	7%
Taxis	10%
Microbuses	15%
Private cars	65%

If you know that the percentage of peak hour traffic to the daily volume is 10% and the peak hour factor is 0.85. Knowing that the directional distribution is 60/40 for the NB/SB directions, calculate the design traffic flow (q) in passenger car units per hour for the northbound direction.

Passenger Car Equivalency Table

Vehicle Class	PCE
Trucks	3.0
Buses	2.5
Microbuses	1.5

Higher Technological Institute   (CT 253) Transportation Planning and Traffic Engineering   10ᵀᴴ OF RAMADAN CITY
Civil Engineering Department   Spring (2019)
Dr. Mohamed Reda   Assignment No. (2)
                                        Volume and Spot Speed

HIGHER
TECHNOLOGICAL
INSTITUTE

4. The following data were collected using Automatic Traffic Counters installed on a highway section in Egypt during the month of August.

Day	Daily Volume
Sunday	27500
Monday	35500
Tuesday	42200
Wednesday	37800
Thursday	36500
Friday	28900
Saturday	16800

The daily adjustment factor of Mondays in August was obtained from a nearby permanent count station of similar characteristics and it was found to be 1.1. The monthly adjustment factor was also calculated at the same nearby station and was found to be 1.25, calculate:

   a) The AADT at the count station.
   b) The design hourly volume assuming a K-factor of 0.12.
   c) If the actual AADT calculated at the section was found to be 46,500 vehicle/day. What is the amount of error attributed to the use of adjustment factors.

5. A spot speed study was undertaken on Cairo-Alexandria desert road using a speed gun. The final results are presented in the table below.

Speed Bin (km/hr)	Number of vehicles
50 - 55	2
55-60	7
60-65	12
65-70	18
70-75	35
75-80	60
80-85	90
85-90	118
90-95	145
95-100	155
100-105	160
105-110	149
110-115	110
115-120	75
120-125	40
125-130	12
130-135	1

   a) Calculate the mean and variance of the recorded spot speeds.
   b) Draw the frequency distribution and cumulative distribution.
   c) Use the graphs to determine the median and modal speeds, and the pace.
   d) Determine the 15ᵗʰ and the 85ᵗʰ percentile speeds.