Assignment 3: Obtaining zonal totals and trip distribution modelling

For this assignment you will **calculate** the zonal totals of the household trip generation for the models you developed in the last two assignments. For calculating the zonal totals, you will be using a new data set that has been uploaded along with the assignment – the name of the new data file is HHSIZ, HHVEH, and INCOME, HHWRK.

Logistics

- **Prepare a 1-to-2-page** (Font size: 10 to 12 point, single spacing) **report in Microsoft Word.**
- Please note that you can work in a group of 2 members for the assignment.
- You can divide the work among yourselves. *But the assignment should clearly identify which portion has been written and analyzed by whom. Without a clear statement about the member contribution the assignment will not be graded.*
- For analysis I highly recommend that you use some programming language and not rely on Excel, I will provide some help on R – but you will need to work on your own if you choose other languages such as Python or Matlab.

Submission

For this assignment you will need to forecast the zonal total using the following two models

(i) A model that includes the independent variables in the linear form

(ii) A model that includes dummy variables

Your data includes households that belong to 6 zones – specifically the Traffic analysis zone (TAZ) numbers are 522, 521, 175, 39, 72, and 906. You will need to give me the total trips generated from each zone using two types of models. One model where all the variables are linear and a model where you have used at least one dummy variable.

For forecasting using the linear form and the dummy model form you will need to use the following two types of equations. *Please note that you SHOULD NOT use the following equations. I am providing the equations just to communicate the type of the equation – you SHOULD use the estimates of the parameters you obtained in your previous assignments.*

(i) For linear form of the equation, you need to follow the form for forecasting

$$T_i = H_i(0.91 + 1.44\overline{X}_{1i} + 1.07\overline{X}_{2i})$$

- where Ti is the total number of HB trips in zone i, Hi is the total number of households in it and X_{ji} is the average value of variable Xj for the zone.

(ii) For equations with dummy variables please consult the following form

$$T_i = H_i(0.84 + 1.41\overline{X}_{1i}) + 0.75H_{1i} + 3.14H_{2i}$$

- where H^{ji} is the number of households of class j in zone i.

If you want to complete the assignment in excel you can use the sumif() or averageif() formulae for obtaining zonal averages of the variables. Some important formulae are provided in the excel file HH_file_with_formulae.xlsx file

If you do the assignment in excel please remember to upload the excel file along with the submission.