

## Assignment 2

### CE 787A: Computational Tools for Transportation Engineering

**Total Marks: 25**

**Instructions:** Use Jupyter notebook to work on this assignment using Python language. All cell outputs and visualizations (if any) should be visible and necessary comments should be put to make the code readable. Once the code is ready, convert it to HTML (File > Download as HTML), save the html as pdf, and submit the pdf.

Also, submit the *.ipynb* file of the jupyter notebook separately.

1. The zip file file ‘ques1\_images’ contains 12 image files (png images). These images are actually traffic data heatmaps (we will discuss heatmaps later in the class). The file name convention is I-*RoadNumber*-*RoadDirection*-*WeekNumber*-*DayofWeek*.png. For example, I-35-NB\_EB-Week39-Mon.png is the heatmap for the *RoadNumber* I-35, *RoadDirection* NB\_EB, *WeekNumber* 39 and *DayofWeek* Mon. With this required information, perform the following tasks:

- a) List all the png files present in the *ques1\_images* directory. Output the list that you have created and the number of png files that are present in the directory. 2+1
- b) Create a dataframe with a single column named “Image\_Path” which contains the file path of the png files. 2
- c) Add four columns to your dataframe which will have RoadNumber, RoadDirection, WeekNumber, and DayofWeek respectively for each image file path. A sample row of the output dataframe is at the end of this question. A sample row of the output dataframe is at the end of this question. 5
- d) Create a new column named “NewImagePath” in your dataframe which will contain new file path. The new file path will be of the format *ques1\_output/RoadNumber/Direction/DayofWeek\_WeekNumber*.png. 4
- e) Find out the unique DayofWeek that are present in the input images (Hint: you can create a set from the column DayofWeek). 2
- f) Create a dictionary using key as “ImagePath” column and value as “NewImagePath” column of your dataframe. 3
- g) Iterate over the dictionary using *for* loop and copy the images from *ImagePath* to *NewImagePath*. Create new directories if you need with the help of *os* module to copy the images to the *NewImagePath*. 6

Image_Path	RoadNumber	RoadDirection	WeekNumber	DayofWeek	NewImagePath
I-35-NB_EB-Week39-Mon.png	I-35	NB_EB	39	Mon	ques1_output/I-35/NB_EB/Mon_39.png