**Lab # 1**

**Topics covered: Regression, cluster analysis, and PCA**

Using the data cars.tab do the following tasks:

1. Build a model to predict the miles per gallon (MPG) given the rest of the features on the data set.
2. Provide an explanation about how good or bad is your model based on empirical evidence, diagnostics, etc
3. As you might have noticed, one challenge in building a model is when you try to use the feature “Car”. Explain why does this happen? Provide a solution about how to go around this problem by using cluster analysis.
4. If you thing about this dataset as a multivariate dataset, then try to explain some of the variability by using Chernoff faces, and then using Principal component analysis (PCA)
5. What does a PCA tell you about the cars dataset?
6. If you use a PCA to perform a Principal components regression (PCR), how does your predictive model would perform?
7. Make a comparison against your model on (1)