**Machine Learning Model**

The model I came up with for classifying cars into the four categories (vgood, good, acc, unacc) is based on demotions. That is, cars with certain attributes are demoted a level for having certain values. This is an intuitive model in this case, because there is the inherent notion that a car that is vgood is ‘better’ than a car that is ‘unacc’. This means this can be applied to the values each attribute has also. For example, a car having value ‘low’ for ‘maint’ is preferable to a car having value ‘vhigh’ for ‘maint’. Here is a list of attributes and their values according to assumed value (best to worst):

* Example Label: vgood > good > acc > unacc
* Buying Attribute: low > med > high > vhigh
* Maint Attribute: low > med > high > vhigh
* Doors Attribute: 5more > 4 > 3 > 2
* Persons Attribute: more > 4 > 2
* Lug\_boot Attribute: big > med > small
* Safety Attribute: high > med > high

Each example would start with the label of ‘vgood’, and if certain attributes had less desirable values, that example’s label would be demoted a certain number of levels (for one level demotion, the new label would be good).