**Example 3: Dimensionality and Model Fitting**

3a. Dimensionality expansion is a common problem in Machine Learning problems and is something that must be removed. If there is a way to undermine the ability to reduce the dimensions, we can remove the complexity and make the plane of possible outcomes much easier to understand and value. How can we go about removing dimensionality but at the same time keep the important attributes intact?

3b. Reducing the dimensionality will decrease the complexity of the model and remove the black box attribute to a great extent. This reduction is not only feasible to a great extent by the advent of advanced hardware, but also the introduction of the latest and greatest algorithms. However, reduction is still a problem. Why will optimal reduction continue to plague the creation of models in the future?

3c. How long would it take to reduce the dimensionality of a model that has 5 parameters and 10 different features to look at? (Not a numeric value of time, just relative answer is fine)

3d. Suppose a company would like to investigate different factors as to why their logistics are inefficient. They would like to know how they could replace this inefficient system and look at the most important factors affecting the system to make it inefficient. They made their own model to model all kinds of changes in factors they think are important.

3e. In regularizing our model for both time and size, we naturally want to regularize both simultaneously. How can we go about finding a happy medium (a fast model that also looks at a wide array of different features)?

3f. How much processing power do you believe it would it take for a model of varying feature sizes to be able to expand on its own and enhance its abilities using learning models that we discussed? Is this feasible given the current technology landscape?

3g. Why is it not a good idea to choose a large number of features to look for when selecting a significant model for which to model our results?