Simplicity Is The Ultimate Sophistication

Over the years, I have develoepd a set of philosphy which guides my decision making at work. This philosphy can be expressed as follow:

$$\min_{\beta \in \mathbb{R}^d} \{\|y - \mathbb{X}\beta\|_2 + \lambda \|\beta\|_1\}$$

For those coming from a quantitative background, you would recognise that this is the LASSO equation or regularised linear regression. This simple equation has influenced me in many aspects and I would like to provide a simple explanation of its power.

This expression is a reflection of personal preferences based on my experience. It should not be seen as irrefutable or universal.

Breaking Down The Equation

First of all, let's provide the equation with some context and decompose it into meaningful pieces.

Let us begin by reassign meaning to the abstract symbols in the equation above,

$$y = \text{goal}$$

$$\mathbb{X} = \text{action}$$

$$\beta = \text{resources}$$

$$\lambda = \text{restriction factor}$$

and also let us define **result** as the amount of **resources** allocated to each of the possible **actions**,

$$\mathbb{X}\beta = \text{result}$$

We can then re-write the equation in a more interpretable form:

$$\min_{\text{resources} \in \mathbb{R}^d} \{\|\text{goal} - \text{result}\|_2 + \text{restriction factor} \times \|\text{resources}\|_1\}$$

In brevity, the equation can be broken down into two components.

1. $\|\text{goal} - \text{result}\|_2$
2. $\text{restriction factor} \times \|\text{resources}\|_1$

The first component indicates our desire to minimise the difference between the outcome of our work and the end goal. On the other hand, the second part reflects the amount of resources we can allocate to this particular goal as we have competing goals and limited resources in life.

The **restriction factor** captures the importance of the task. If the goal is life-threatening, then we would not impose any restriction on the amount of effort (The restriction factor would thus be zero and simplifies the equation to just the first component). However, if the task is trivial, then we would impose a high **restriction factor** to limit the amount of resources devoted to the job.

How this affect the way I work

Focus On the Necessary

In one of the previous project I lead, we were involved with several teams of varying expertise and background. This diversity has lead to a plethora of requests which were impossible to address. With the principle in mind, we were able to isolate the necesary tasks to ensure the success of the project.

Project Management and Prioritisation

We are constantly faced with never-ending challenges with limited resources. The principle naturally incorporates this reality and continually reminds me the importance of task prioritisation, and investment of resources should be carefully weighed against the benefits.

KISS - Keep It Simple Keep It Stupid

The equation can also be seen as a manifestation of the Occam's Razor.

As a data scientist, I am naturally excited about new technology and sophisticated models. Nonetheless, the amount of work and vulnerability usually grows exponentially with increased complexity. As a result, when facing model with similar performances, my preference always lies with the simpler model.