The Data-Shack workshop: W3. Advanced analytics (2 days)

(Complex relationships & advanced process optimisation) - **Bring your own data and business questions ("points of pain") and we'll teach you the analytics**

Prerequisite

Intermediate analytics (2 days)

Preparation

At least 2 weeks prior to workshop date, the following are required:

- business "points of pain" to be addressed
- clean data to confirm applicability

Objectives

Using your own data, introduce delegates to:

- analysis of variance (ANOVA), and an in-depth understanding of all the ANOVA methods
- advanced non-linear regression techniques
- sophisticated design of experiments (DOE) techniques, and demonstrate the incredible power of structured experiments for efficient process optimisation

Description

This two-day workshop significantly extends the "Intermediate analytics" workshop, and is designed to instruct the delegates on how to undertake complex analyses that seek to establish relations between variables, using advanced ANOVA and/or multiple non-linear regression. These are essential building blocks to understand the incredibly powerful and useful technique of "design of experiments" (DOE).

DOE is used extensively in process optimisation methodologies (e.g. 6σ DMAIC) to enable the rapid and efficient attainment of optimal settings for processes, in order to deliver on-target outputs.

Once you understand DOE, you will never look back, and the road to optimally tuned processes will be that much smoother.

Outcome

Delegates will leave the workshop with an excellent theoretical and practical understanding of Advanced Analytics Techniques to apply immediately back into the business and their own operational processes.

Topics*

1. Differences between multiple groups
   - 1.1. Recap of factorial & repeated measures ANOVA
   - 1.2. Complex repeated measures ANOVA
   - 1.3. ANCOVA
   - 1.4. Nested designs
   - 1.5. MANOVA
   - 1.6. MANCOVA
2. Correlational models using continuous predictors
   - 2.1. Recap of multiple linear regression
   - 2.2. Multiple linear regression using "best subsets"
   - 2.3. Multiple non-linear regression
3. Advanced Design of Experiments (DOE)
   - 3.1. Recap of full factorial & CCD DOE's
   - 3.2. Fractional factorial screening designs
   - 3.3. Multiple response optimisation
   - 3.4. Mixture designs

* Note that the list of topics covered may vary slightly depending on the nature of the business questions to be answered, and the content of the supporting data supplied by the delegates

Timing

10:00 – 11:00 Session 1 (1 Hour)
11:00 – 11:15 Break (15 min)
11:15 – 12:15 Session 1 (1 Hour)
12:15 – 12:45 Lunch (30 min)
12:45 – 13:45 Session 1 (1 Hour)
13:45 – 14:00 Break (15 min)
14:00 – 15:00 Session 1 (1 Hour)