A note on the g and h control charts

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Abstract

In this note, ...

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1 Introduction

Introduction here....

2 Basic .....

For example, Beyyeyan [1, 2], to name just a few .....

It is iemediate from [3] that ....

We can employ the Rao-Blackwell theorem [4, 5] .....

For example, Minitab [6] uses .....

It should be noted that the R language provides the `hypergeo` package to calculate the hypergeometric function; see [7].

In his thesis [8]

[9]

[10]

[11]

3 Equation.....

In Section 2, we reviewed .... In this section, we will solve some equations.

We have

$$x + y = 0 \tag{1}$$

Substituting $x = -3$ into (1), we have

$$y = 3.$$

However, if one use $x = -10$ in (1), then we have

$$y = 10.$$

We solved an equation. In Section 4, we will incorporate this result into several engineering applications.

4 Application .....

References

[1] J. C. Benneyan. Geometric-based g-type statistical control charts for infrequent adverse events. In *Institute of Industrial Engineers Society for Health Systems Conf. Proc.*, pages 175–185, 1999.

[2] J. C. Benneyan. Number-between g-type statistical quality control charts for monitoring adverse events. *Health Care Management Science*, 4:305–318, 2000.

[3] E. L. Lehmann and G. Casella. *Theory of Point Estimation*. Springer-Verlag, New York, second edition, 1998.

[4] C. R. Rao. Information and accuracy attainable in the estimation of statistical parameters. *Bulletin of the Calcutta Mathematical Society*, 37:81–91, 1945.

[5] D. Blackwell. Conditional expectation and unbiased sequential estimation. *Annals of Mathematical Statistics*, 18:105–110, 1947.

[6] Minitab. Methods and formulas for g chart. Minitab 20 Support, 2020. `https://support.minitab.com/en-us/minitab/20/` (accessed on December 24, 2020).

[7] R. K. S. Hankin. `hypergeo`: The Gauss hypergeometric function. `https://CRAN.R-project.org/package=hypergeo`, 2016. R package version 1.2.13 (published on April 7, 2016).

[8] X. Gao. *Determination of the Optimal Facility Location based on the Minimum Distance Approach*. PhD thesis, Pusan National University, Busan, Korean, 2020.

[9] R. Jeong, S. B. Son, H. J. Lee, and H. Kim. On the robustification of the z-test statistic. Presented at KIIE Conference, Gyeongju, Korea. April 6, 2018, 2018.

[10] L. Ouyang, C. Park, J.-H. Byun, and M. Leeds. Robust design in the case of data contamination and model departure. In Y. Lio, H. Ng, T. R. Tsai, and D. G. Chen, editors, *Statistical Quality Technologies: Theory and Practice (ICSA Book Series in Statistics)*, pages 347–373. Springer, Cham, 2019.

[11] H. J. Eun, B. D. Lim, W. S. Cheung, Y. H. Kim, and C. Park. Development of acoustic antenna technology for noise source detection. Technical Report KSRI-89-92-IR, Ministry of Science and Technology (Korea), 1989. Written in Korean.