A nonlinear programming problem using branch and bound method.

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Abstract:

Taking the clue from the pioneer work of Tarray and Singh (2015) we have suggested a new stratified randomized response model. In this paper the problem of optimal allocation in stratified random sampling where randomized response technique is used in presence of non response. The problem is formulated as a Nonlinear Programming Problem (NLPP) and is solved using Branch and Bound method. Also the results are formulated through LINGO.

KEYWORDS: Randomized response technique, Estimation of proportion, Respondents protection, Negative Binomial Distribution, Optimum allocation, Stratified random sampling, Dichotomous population, Sensitive attribute, Branch and Bound method.

MSC: 62D05.

A partir de trabajo pionero de Tarray and Singh (2015) hemos sugerido un Nuevo modelo de respuestasaleatorizadas estratificado. En este trabajo se utiliza el metodo de las respuestas aleatorizadas para el problema de la afijacion optimal ante la respuesta de no respuestas. El problema es formulado como uno de Programacion No-lineal (NLPP) y se resuelve usando un metodo de "Branch and Bound". Tambien son formulados los resultados a traves del LINGO.

Full Text:

1. INTRODUCTION

Surveys are a means by which responses to questions concerning certain topics may be obtained from a sample of individuals selected in some manner from a population of interest. Results from surveys are affected by two main sources of error. The first is sampling error that results from taking a sample instead of enumerating the whole population. The second type of error is non-sampling error that cannot be attributed to sample-to-sample variability. Non-sampling error has two different errors which are random error and nonrandom error. Random error, which results from a reduction in the reliability of measurements, can be minimized over repeated measurements. However, nonrandom error, which is bias in the survey data, is difficult to cancel out over repeated measurements. In order to reduce non-response and response bias, a survey technique different from open or direct surveys was needed that made people comfortable and encouraged truthful answers. Warner (1965) developed such an alternative survey technique that is called randomized response (RR)