BEST: International Journal of Humanities, Arts, Medicine and Sciences (BEST: IJHAMS)
ISSN (P): 2348-0521, ISSN (E): 2454-4728
Vol. 3, Issue 12, Dec 2015, 227-238
© BEST Journals

USING ARTIFICIAL BEE COLONY ALGORITHMTO DETERMINE THE OPTIMAL STRATA BOUNDARIES

MOWAFAQ MUHAMMED AL-KASSAB&MUHAMMEDABDULJABBARAL-HASAWY

Department of Statistics & Informatics, College of Mathematics and Computer Sciences, University of Mosul, Mosul, Iraq

ABSTRACT

Stratified random sampling is used when the researcher wants to highlight a specific subgroup within the population. This technique is useful in such researches because it ensures the presence of the key subgroup within the sample. A few numerical and computational techniques have been created for this reason.Some apply to highly skewed populations and some apply to any kind of populations. This paper proposes an ABC algorithm to solve the problem of stratum boundary while distributing the sample size according to Proportional Allocation method. The ABC algorithm is tested on two groups of populations and a comparative study with Genetic Algorithm (GA) of Keskintürk and Er (2007), Kozak's (2004), Lavallée and Hidiroglou's (1988) and Dalenius and Hodges(1959) methods have been implemented. The numerical results show the ability of the proposed algorithm to find the optimal stratified boundaries for a set of standard populations and various standard test functions compared with other algorithms.

KEYWORDS: Stratified random sampling, Artificial Bee Colony, Optimal Strata Boundaries, Proportional Allocation