ST. XAVIER'S COLLEGE (AUTONOMOUS), KOLKATA

DEPARTMENT OF STATISTICS

COMPARISON BETWEEN CLASSICAL AND BAYESIAN APPROACH TO ESTIMATE UNKNOWN POPULATION PARAMETER

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<u>SYNOPSIS</u>

<u>INTRODUCTION:</u>

One of the main objectives of Statistics is to draw inferences about a population from the analysis of a sample drawn from that population. Statistical inference has two branches, namely, 'Theory of Estimation' and 'Testing of Hypothesis'. 'Estimation' has two categories which are 'Point Estimation' and 'Interval Estimation'. Now, let us consider a random variable X with p.m.f. or p.d.f. $f(x, \theta)$. Here in this project, we consider only the point estimation, which takes into account to pick a suitable statistic, a function of sample observations, that best estimates the unknown population parameter θ.

<u>OBJECTIVE:</u>

Among the several approaches of point estimation, here we are considering only two approaches, namely, i) Classical approach and ii) Bayesian approach, to estimate some unknown population parameter. Our main objective is to make comparison between estimators corresponding to the two approaches mentioned above.

<u>METHODOLOGY:</u>

Here in this project we are considering Maximum Likelihood Estimator of the population parameter based on the sample observations which supports the Classical approach, where we consider the unknown parameter to be a fixed quantity. But if it is known that the considered population parameter is not a fixed quantity rather a random variable with some known distribution, the Bayesian approach provides a way to utilize this additional information about the parameter to incorporate in our inference to propose an estimator. In this approach the distribution of the unknown parameter is known as the prior distribution and the distribution of the parameter given the sample observations from the original population under study is known as posterior distribution of the parameter. We will choose only the different conjugate prior distributions for the parameter and the posterior mean will be considered as a Bayes Estimator. For comparison between the two mentioned approaches the method of resampling will be considered.