

Nearest neighbor regression and kernel regression have been discussed with imputing missing data in survey sampling for decades. In this study, methods of regression imputation are examined for estimating the mean of an incomplete variable and for predicting unidentified objects in the data. Novel convex mixtures of these two regression imputation estimators are constructed for keeping stable performance when the underlying missing data conditions are non-regular in applications. Using a simulation study of two typical non-regular conditions, the mixture imputation is shown to yield improved estimation against the existing competitors. The performance of predicting unidentified classes by the convex mixtures imputation estimators is also examined using two data sets from the UCI Machine Learning Repository.