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Integrating the simple random sampling approach into the
classical test theory (CTT) for large-scale data sets.
(Reducing process time)

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Abstract:

One of the most popular methods of multiple choice test analysis is the Classical Test Theory (CTT) method. This method is convenient for performing calculations on small data sets such as test analysis for final exams, school or university entrance exams. When data is being processed on a large scale (for example, national university entrance exams with more than 500,000 candidates), even computers face difficulty and time consumption calculating Facility and Discrimination indexes. In this paper, it has been sought to integrate the Simple Random Sampling (SRS) method with the CTT method and reduce process time in calculations.

The conclusions showed, questions that require a lot of time to calculate the indexes could achieve the same results in a significantly shorter amount of time. For example, a question which had a P index value of 0.50 after 7393 minutes (more than 133 hours - 5 days), had been estimated 0.503 for the mean value after 10 iterations and an average time of 129.2 minutes. Therefore, the use of this method is strongly recommend in large national organizations that conduct entrance exams for educational institutions in a centralized manner throughout the country.

Key Works: Statistical Sampling, CTT, Large-Scale Data, Process Time.