

# Item Bank Extension Models

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**Keywords:** Linear Programming, Optimal Test Assembly, Infeasibility

## Abstract

In optimal test assembly tests are assembled using a mathematical model in which the demands of the test assembler are usually written as linear constraints, and the goal of the test assembler is also written as one or more linear functions. Such optimal test assembly is referred to as Linear Programming Test Assembly (LPTA). When there is no solution to this mathematical model, the model is said to be infeasible. In the short-run, where a test must be assembled immediately, infeasibility is usually overcome by relaxing the constraints. Thus in fact violating the original demands of the test assembler. In the long run, however, another approach is advised, which is to extend the item bank. Writing items can be costly process, and it should be investigated beforehand which type of items is most necessary to prevent future infeasibilities. This paper researches how to implement such an item bank extension model by adding hypothetical items to the item bank, and how to choose the characteristics of the hypothetical items.