ABSTRACT

We consider the problem of listing distinct triples that satisfy certain properties. This problem is known as triad design of order $v, TD(v)$. This design exists for $v \equiv 1$ or 5 (mod v). Much of our work deals with the enumeration of several triad design, for example $TD(7), TD(11)$ and $TD(13)$. These processes have helped us develop algorithm for triad design, the objective of this study. A new technique for triad design algorithm, known as Interval Generation Method was employed to construct $TD(6n + 1)$ and $TD(6n + 5)$. This method depends on analyzing the pattern of triples in the design to build starters. We begin by producing starters from Interval Generation Method as the initial block to begin with. Then the algorithm begins by cycling modular v from the initial block and finishes when the process approaches the initial block. The algorithms for $TD(6n+1)$ and $TD(6n+5)$ are presented in Chapter 4 and 5, respectively. As the entire study depends mainly on $TD(v)$ algorithms, new and remarkable theorems and lemmas for $TD(v)$ development are presented and proved.